

Talking Points for a debate with Tom Hazlett on TV band white space use

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Summary

- Not either/or choice between L and UL: need to decide best for this specific case
- UL is best for white space junk bands
- Mixed L/UL is a necessary regulatory hedge, and in fact synergistic

Not either/or

- Don't face an abstract universal choice of what's better in all cases, EAFUS/tradable-licensed ("L") or Commons/unlicensed ("UL")
- Hazlett's "marginal allocation challenge" – given x MHz, what do you do?
- Not aware of underlying economic theory that treats L and UL in the same way, and which affords mechanism for choice

Specific case: "digital dividend" repacking of bands leads to

- Open 700-800 MHz band -> auction
- White spaces in remainder -> ? Will argue should be UL, not L

White space is a "junk band"

- Stringent non-interference burden vis a vis TV broadcasts
- Relatively few channels in major metros, most adjacent to TV
- Many channels in rural areas, but few people – high auction transaction costs but low values (cf. AWS auction prices)

UL works well in junk bands – cf. experience in 2.4 GHz

- Spread spectrum, LBT works to share spectrum capacity without need for exclusive assignment to band manager
- Reports of the death of the commons greatly exaggerated
 - Dilemma burden on UL: if unused, then "a waste"; if heavily used, the "tragedy of commons"
- Generates lot of innovation
- Wi-Fi > 60 bn devices, Bluetooth > 1 bn devices, Canopy proprietary standard
- Note: not saying UL leads to more innovation than L; tech \perp regs
- Not just limited to short range, just within property lines: WISPs, offices on different floors, campuses

Benefits of UL in white space

- More economical for rural WISPs, muni mesh – early stage when need coverage, not capacity
- Bigger footprint for hotspots, easier to find/connect
- User-deployed neighborhood meshes
- Sensor meshes (industrial, ag)
- White space offers in-fill range at low power (100's meters at <100 mW; cf. 10's m

for 2.4 GHz UL, 1000's m for O(GHz) L)

- Very low electrical power drain at short range and v. low power

Choosing L vs. UL

- No demand curve for UL, so can't calculate consumer/producer surplus – so can't compare to surplus calcs for CMRS
- Market size no indication of value – huge-value \$0 bn markets, e.g. OSS, wikis
- Other goods have public/private ownership mix: roads, parks, intellectual goods
- “Managed UL” will be underprovided in all-L scenario (collective action dilemma)

Hedge

- Scarcity
 - Can't predict capacity vs. usage outlook, so can't predict scarcity
 - If scarce, bias to L; if not scarce, bias to UL (short cut around slow anti-trust proceedings)
- Lock-in
 - Any regulatory regime choice locks in outcomes – no way back if make global choice too early
- Govt Greed
 - Moral hazard: get more revenues if slow down auctions to create artificial scarcity
 - UL outlet for entrepreneurs – pay price of putting up with interference if the price of licenses too high

L/UL synergistic, not just complement

- Combo better, so L+UL not just a hedge argument
- Cf. T-Mo, QCOM: offering Wi-Fi plus cellular packages
- Cf. intellectual property
 - Copyright + public domain
 - E.g. Jasper Fforde, Eyre Affair
 - Fair Use like underlay
- Cf. parks (Nat'l Recr & Park Assoc)
 - Dallas – homes on 14 parks, 22%+ in value
 - 1-3% value of home if < 1,500 ft from park

Problems with spectrum-title/tradable-licenses in white space

- Hard to define property right – secondary to TV, can lose access if new TV is licensed, squirly interference requirements
- Definition of rights (by govt) even just for OOB emissions selects some services over others, just as UL rules do (can't resolve by Coasian negotiation generally – too many counter-parties)
- Illiquid market in rural areas – high transaction costs of low-yield auctions
- Markets don't end rent seeking via lobbying – cf. R&D tax credit, commodity subsidies, energy companies, ...
- Single national overlay license pipe-dream: politics \Rightarrow multiple licenses, lots of small rurals \Rightarrow high transaction costs, difficulties with Coasian negotiations with many

broadcasters

Show me the money – interests shape analysis

- Cellular eqmt vendors– today mostly infrastructure and edge equipment for L
- Broadcasters – option value of licenses
- IT companies – free infrastructure input with UL
- Audio eqmt companies – most sales are for non-L microphones operating with L protection
- Progressives – suspicious of large spectrum owners, seek diversity
- Marketeers – never saw a property right they didn't like