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July 14, 2010

VIA ELECTRONIC DELIVERY

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street, SW
Room TWA325
Washington, DC 20554

Re: Notice of *Ex Parte* Presentation
ET Docket Nos. 04-186, 02-380

Dear Ms. Dortch:

On July 13, 2010, Joseph M. Sandri, Jr., Senior Vice President of Government and Regulatory Affairs for FiberTower Corporation ("FiberTower"); Richard Engelman, Director, Spectrum Resources-Government Affairs for Sprint Nextel Corporation ("Sprint Nextel"); Fred Campbell, President of the Wireless Communications Association International; and Michele C. Farquhar of Hogan Lovells US LLP, Counsel to Sprint Nextel and Special Counsel to FiberTower and the Rural Telecommunications Group, Inc., met with Julius Knapp, Alan Stillwell, Ira Keltz, Hugh Van Tuyl, and Karen Ansari of the FCC's Office of Engineering and Technology.

During the meeting, the representatives discussed their proposal to permit limited fixed licensed use of a portion of the vacant TV Bands White Spaces ("White Spaces") channels in rural and tribal areas to provide dramatically more cost-effective backhaul options, as described in the attached slides and background paper. The parties noted their flexibility regarding the fixed licensed use of particular channels within the TV Bands, including UHF Channels 14-21 as well as the VHF Channels, and the possibility of limiting fixed licensed use to a percentage of available channels in rural areas. We also noted that the instant proposal can largely accommodate any subsequent "repacking" in the TV White Spaces because dozens of vacant channels exist in the rural and tribal areas at issue in our proposal, and we propose utilizing at most a limited amount of vacant channels in those areas.

In addition, the parties cited the many benefits of licensed use of the White Spaces, including the exceptional propagation features of the band and the availability of low cost antennas, which are ideal for the provision of significantly lower-cost backhaul over much longer distances in rural and tribal areas.

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Pursuant to Section 1.1206(b)(2) of the Commission's rules, I am filing this notice electronically in the above-referenced dockets. Please contact me directly with any questions.

Respectfully submitted,

/s/ Michele C. Farquhar

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Special Counsel to FiberTower Corporation
and Rural Telecommunications Group, Inc.

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cc: Julius Knapp
Alan Stillwell
Ira Keltz
Hugh Van Tuyl
Karen Ansari

PROPOSAL FOR LIMITED FIXED LICENSED POINT-TO-POINT USE OF THE TV WHITE SPACES FOR BACKHAUL TO RURAL AREAS

Summary: Approximately 15 to 45 or more TV white spaces channels lay fallow in rural areas. The FCC should authorize limited fixed licensed point-to-point use of the TV "White Spaces" on UHF TV Channels 21-35 and 39-51 for:

(1) Up to six vacant TV White Spaces channels second or greater adjacent to a TV broadcast station in rural counties; and

(2) Any vacant TV White Spaces channels third or greater adjacent to a TV broadcast station in all counties.

Expedited Action Needed: To enhance BTOP and BIP program efforts to stimulate broadband access in rural areas, the FCC should adopt this narrow proposal on an expedited basis, and before the March 15 application deadline. This will assist BTOP and BIP applicants seeking to deploy far more cost-effective middle mile infrastructure in unserved and underserved areas.

Benefits: Authorizing up to six vacant TV channels would bring many public interest benefits:

- ***Increased Rural Broadband Deployment.*** Backhaul infrastructure must be built before consumers can benefit from innovative new unlicensed and licensed broadband networks and devices; this narrow proposal provides urgently needed, cost-effective "middle mile" backhaul.
- ***Dramatically Lower Backhaul Costs.*** The favorable propagation characteristics of the TV White Spaces, as well as the readily available small lightweight antennas for the band, would reduce the middle mile backhaul and transport costs by as much as 80-90% in rural areas.[1]
- ***Readily Available Fixed Link Equipment and Licensing Scheme.*** More than 300 fixed links are already licensed and installed in the TV Bands under the existing Part 74 Broadcast Auxiliary Service ("BAS") rules; the longstanding use of these frequencies for BAS point-to-point links (some of which are 50-80 miles long or more) ensures the immediate, off-the-shelf availability of point-to-point equipment for backhaul use in TV Channels 21-35 and 39-51. The FCC could amend Part 101 or Part 74 to license non-broadcast fixed link users in the band.
- ***Numerous Vacant TV Channels Available in Rural Areas.*** TV White Spaces channels are widely available in rural unserved and underserved areas, with approximately 15 to 45 or more channels lying fallow in these areas. This narrow proposal would only authorize fixed licensed use on up to six of these channels, permitting many other uses. By contrast, very few additional links are available even in rural areas in the heavily used 6 GHz band.
- ***Protection of Incumbents and New Unlicensed Users.*** The limited number of new licensed point-to-point systems could operate without causing harmful interference to the many incumbent users in the TV Bands, and licensed use allows far greater certainty and accountability to those incumbents. Numerous vacant channels exist in the band for unlicensed users, and unlicensed devices could still operate on channels designated for fixed licensed use, subject to the normal protections afforded to licensed users when operational.
- ***Broadcast Repacking Already Contemplated.*** This narrow proposal only provides for use on a limited number of vacant channels, no matter how they are organized, and would not preclude or require waiting for any broadcast repacking or channel modification proposals.

[1] For example, a 75-mile or longer wireless backhaul link could be constructed at a cost of $100,000-200,000 using two small lightweight antennas; covering the same distance using 3.65 GHz, 6 GHz, or higher-frequency spectrum would require up to four relay towers and a total of ten six-foot diameter dish antennas, costing $3 million or more.

Licensed, Fixed Use of the ***TV White Spaces***

July 13, 2010

Sprint

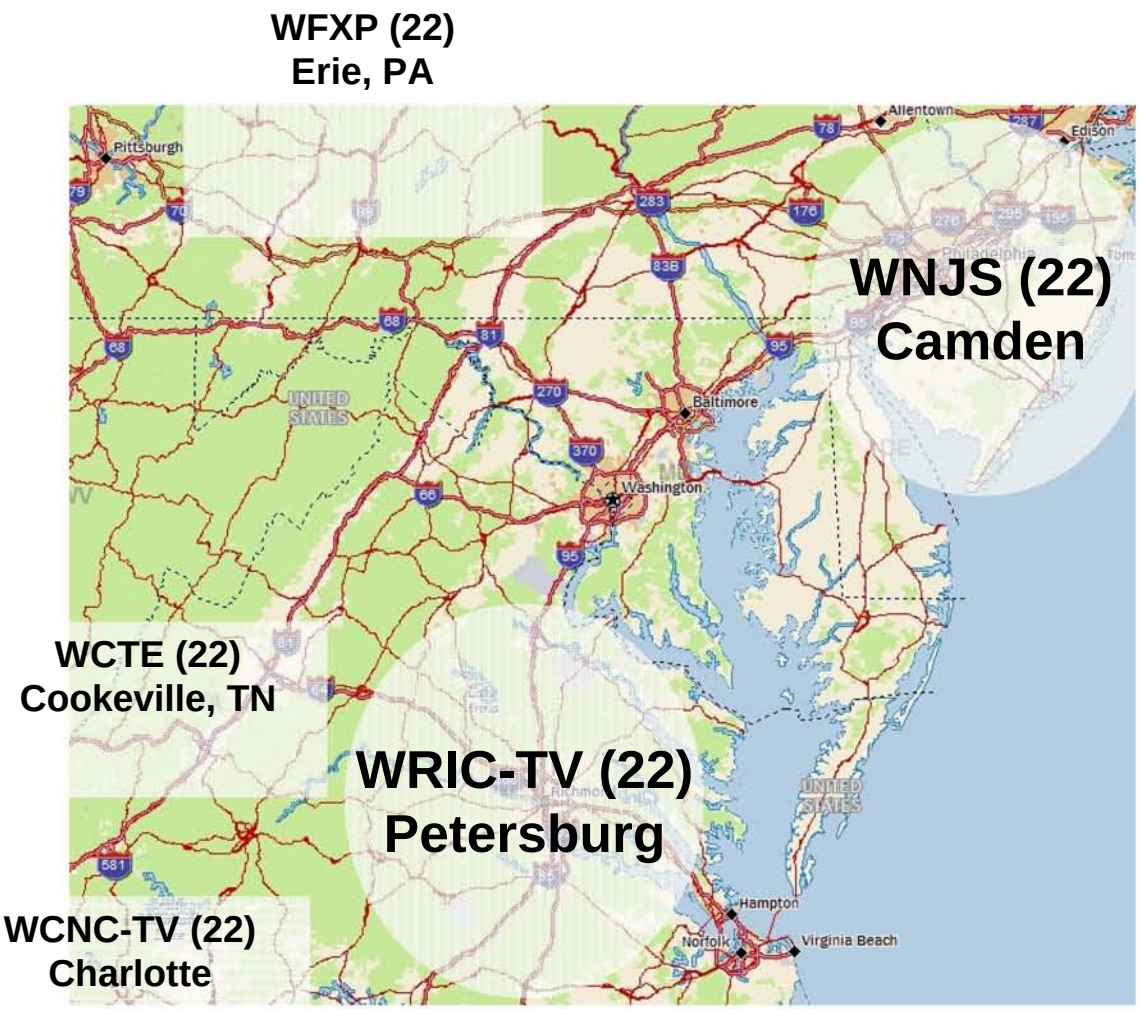
rtg Rural Telecommunications Group

FiberTower

COMPTEL

What is TV White Space?

- TV stations **must** operate at minimum separation distances to avoid interference
- TV "White Space" exists on frequencies and in locations where TV stations and other operations in the TV bands do not transmit



TV stations on Channel 22 near Washington, D.C.

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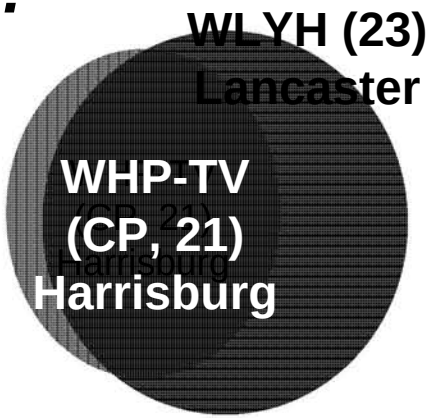
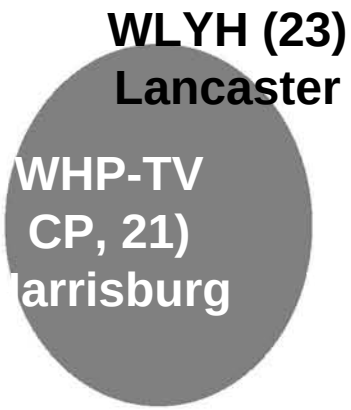
  - 1,785 TV stations nationwide



TV stations on Channels 21-23 near Washington, D.C.

What is currently in TV White Space?

- TV station co-channel and adjacent channels must be protected
  - 1,785 TV stations nationwide
  - 2,939 Class A and LPTV stations
  - 4,391 TV Translators
- Approx. 300 broadcast auxiliary fixed links
- Cable TV head ends
- Land mobile radio services in 13 markets
- Offshore radiotelephone service along Gulf of Mexico
- Medical telemetry devices on TV channel 37
- Wireless microphones
- Soon, unlicensed TV band devices



TV stations on Channels 21-23 near Washington, D.C.

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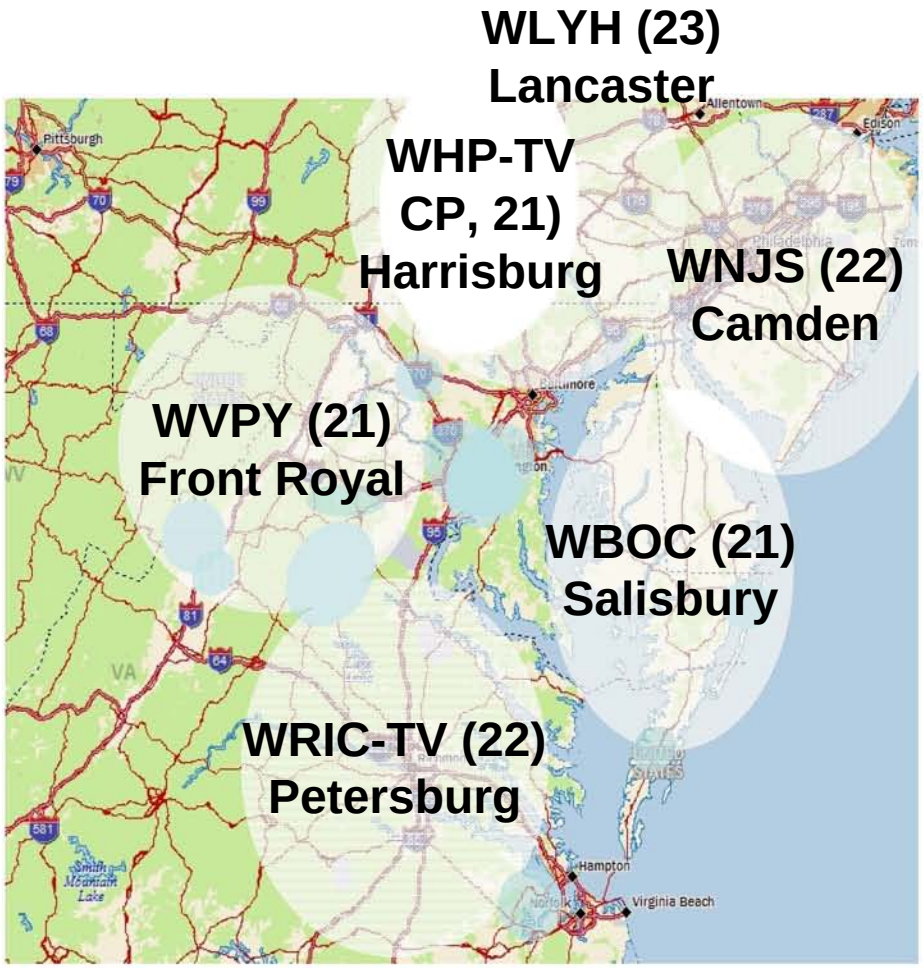
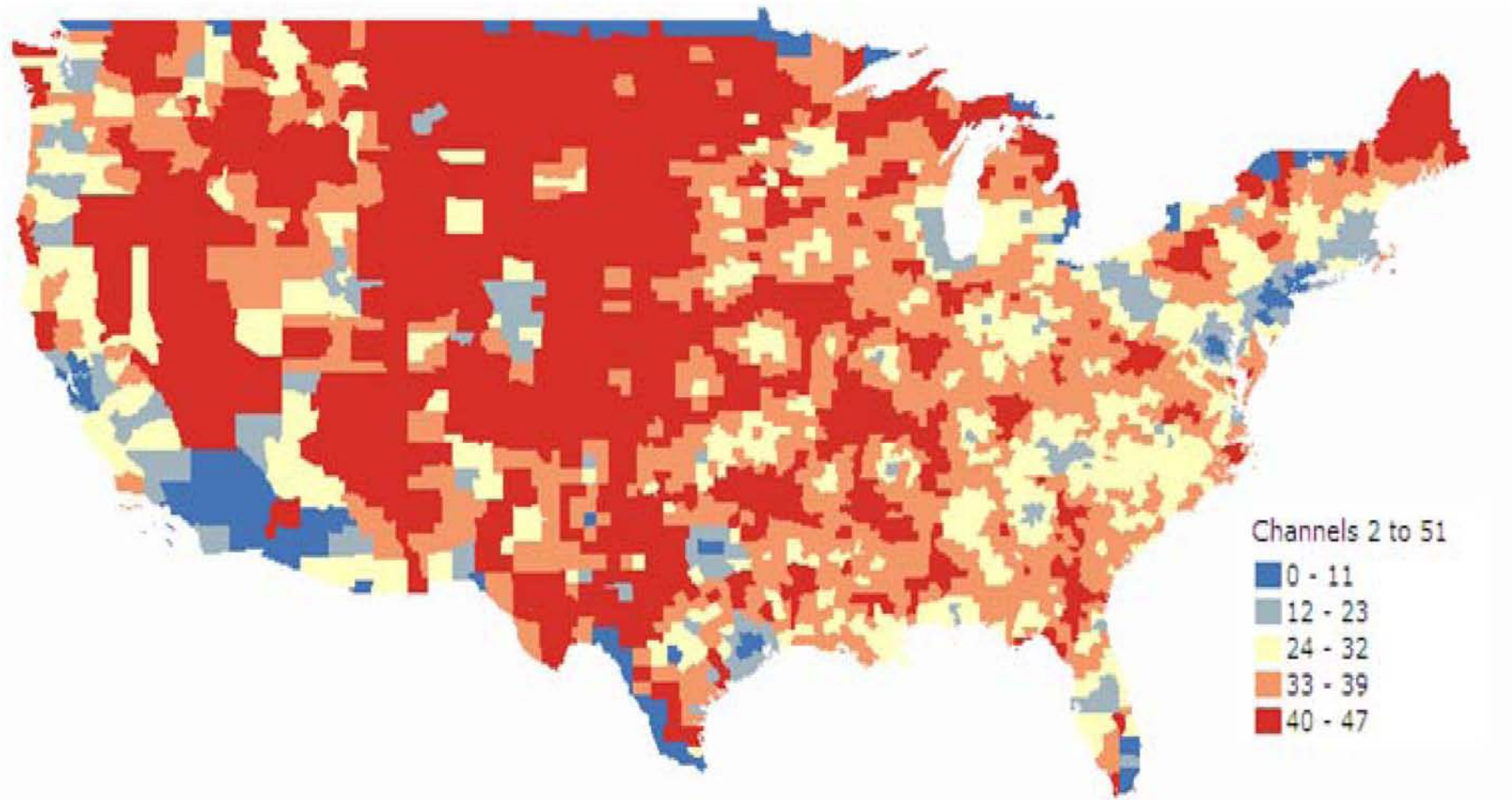


TV stations on Channels 21-23 near Washington, D.C.

How Much TV White Space Exists?

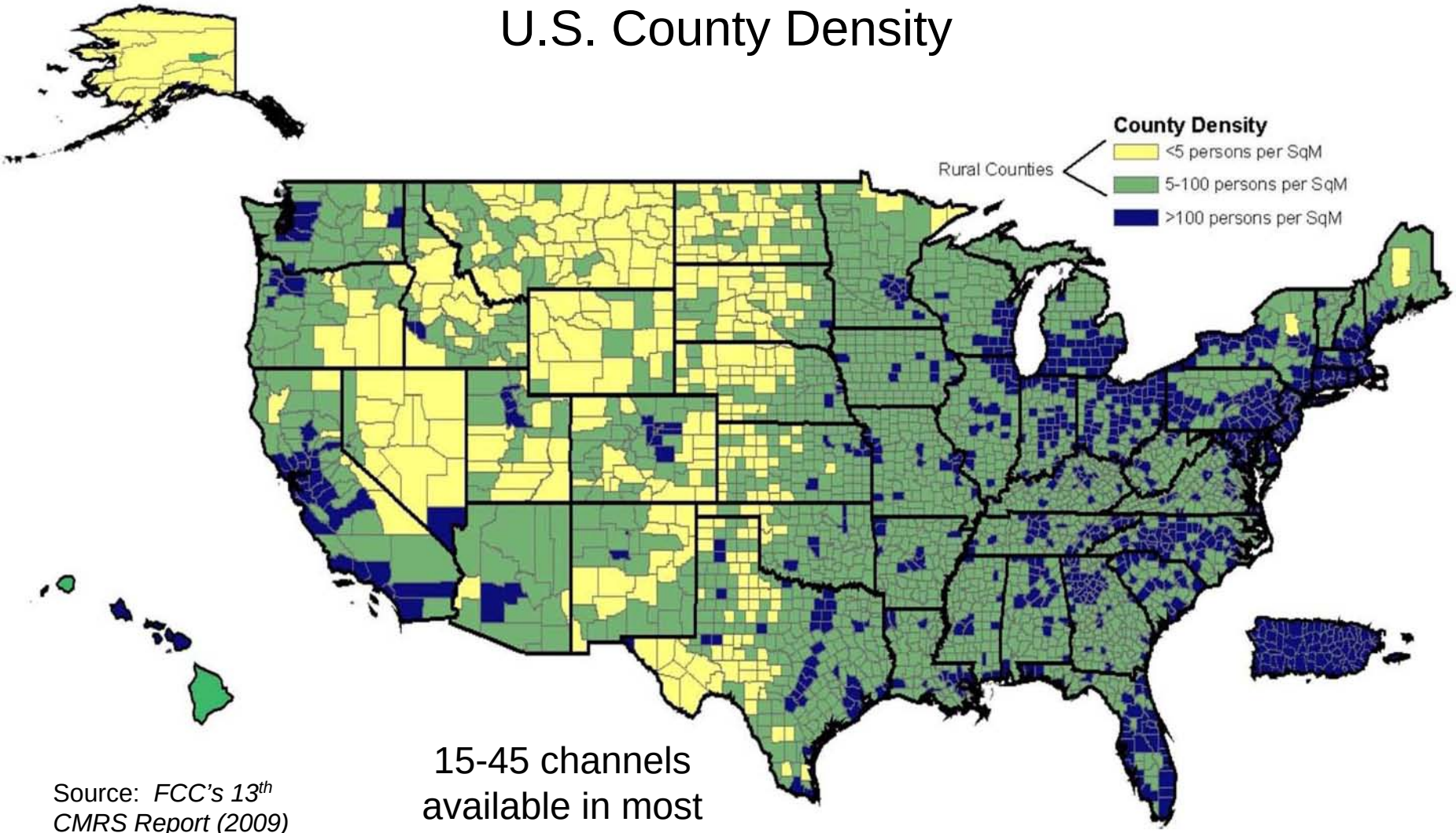
White Space Availability by County



Source: *Ex Parte Letter*, October 1, 2009, filed in ET Dkt. 04-186 by Wiltshire & Grannis LLP, on behalf of Dell, Inc., Microsoft Corp., and Spectrum Bridge Inc.

Substantial White Space in Rural Areas

U.S. County Density



15-45 channels available in most rural areas

Source: *FCC's 13th CMRS Report (2009)*

Chronology of Major Events

- October 18, 2006 – FCC releases First R&O/Further Notice inviting comment on licensed operations in TV bands
- October 2, 2007 – FiberTower and RTG file their “White Paper” proposing a licensed, fixed model
- January-October, 2008 – Sprint Nextel, T-Mobile, NTCA, COMPTEL, and the Rural Independent Competitive Alliance file letters of support
- June 25, 2008 – COMPTEL, RTG, Sprint Nextel, and FiberTower submit draft of proposed technical rules

Chronology of Major Events

- October 29, 2008 – RTG, COMPTEL, Sprint Nextel, and FiberTower submit revised proposed technical rules
- November 4, 2008 – FCC adopts Second R&O/MO&O
- March 19, 2009 – FiberTower, RTG, COMPTEL, and Sprint Nextel file Petition for Reconsideration
- June 12, 2009 – DTV transition completed
- July 14, 2009 – FiberTower, RTG, COMPTEL, and Sprint Nextel file Request for Expedited Consideration of their Petition for Reconsideration

Benefits of Licensed, Fixed Use

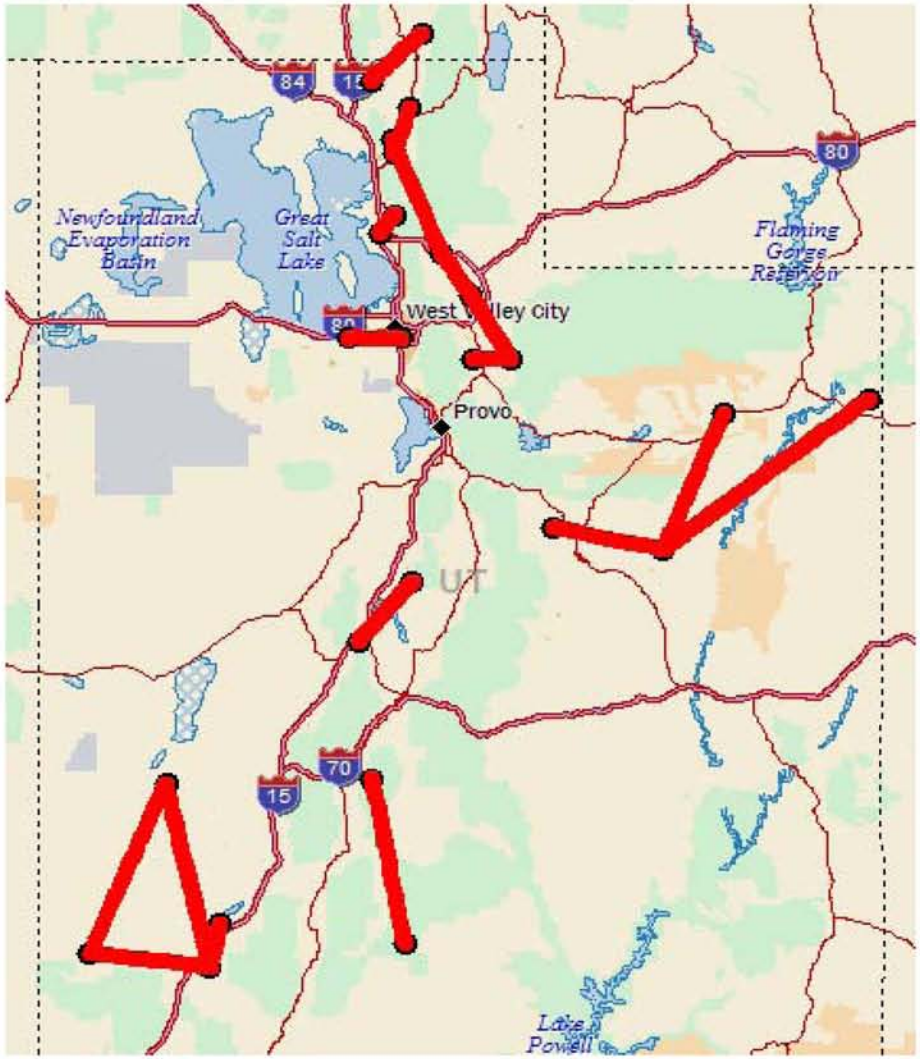
- Ideal for long-range, inexpensive wireless backhaul, particularly in rural areas
  - Current high cost of backhaul is the key factor limiting wireless broadband deployment in rural areas
- Equipment available now; would spur immediate broadband deployment to unserved and underserved rural areas and benefit consumers directly
- Fosters regulatory certainty and protects incumbent users, particularly broadcasters
- Other unlicensed or licensed uses not precluded

Licensing

- Site-by-site basis under Part 101
- Only on UHF TV Channels 21-35 (512-596 MHz) and 39-51 (620-698 MHz)
- Make available six vacant channels in rural counties; must be 2nd or greater adjacent channel to TV broadcast station
- Also make available 3rd or greater adjacent channels in all counties

TV Band Links in Use Today

- 25 licensed TV band fixed links in Utah:
  - range in length from 11.7 km (7.3 mi.) to 131.3 km (81.6 mi.)
  - six links longer than 65 km (40 mi.)
  - average length is 51 km (32 mi.)



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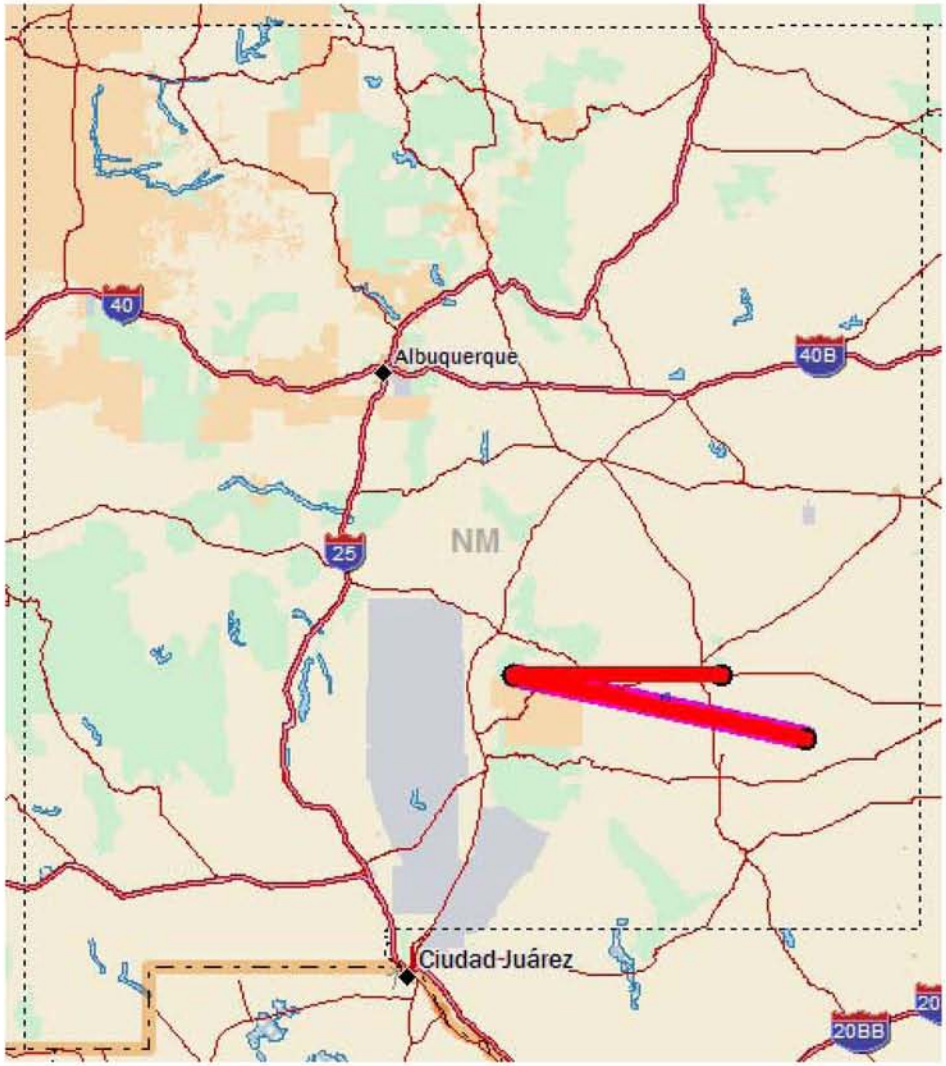
km
0 30 60 90 120 150 180
Data Zoom 5-2

Longest TV Band Link (116 mi.)

WPNI810:

- TV intercity relay, formerly licensed to Acme Television License of New Mexico
- two paths
- Buck Peak/Ruidoso to Roswell, 130 km (81 mi.)
- Buck Peak/Ruidoso to rural Chaves County, 186.5 km (116 mi.)
- Both use 62 dBm EIRP and 18 dBi gain antennas
- Buck Peak 2700 m higher elevation than rural Chaves County path end



TV Band Path Lengths

- With urban power limits (24 dBW/6 MHz), modeling indicates path lengths of ~40 miles w/ 99.995% reliability
- With rural power limits (35 dBW/6 MHz), modeling indicates path lengths of ~70 miles w/ 99.995% reliability
  - Distances can be greater from mountain-top locations
  - Distances can be shorter depending on terrain roughness and multipath conditions
  - Rain fading and atmospheric absorption not a factor at UHF (but are factors for microwave bands)

TV Band vs. Microwave Antennas

Smaller, Lighter, Less Expensive

KATHREIN
SCALA DIVISION

PR-TV series
PARAFLECTOR® ANTENNA
15.5 to 17 dBd gain
470 to 862 MHz

ANDREW
A CommScope Company

HP10-107-D1A
Parabolic Shielded Antenna
48 dBi
10.2-10.7 GHz

PR-TV	Antenna	HP10-107-D1A
1.7 X 0.9 m (68” X 36”)	Size	3 m (10 ft) diameter
38 lb.	Weight	575 lb.
$1,664 for two, plus installation	Cost	$26,960 for two, plus installation

Microwave Path Lengths

Using FCC's ULS database for Utah

Band	# Links	Avg. Length (km)	Max. Length (km)	Ant. Gain (dBi)	Ant. Size (Feet)
UHF TV	25	51.1	186.5	16-18	3'x5.5'
6 GHz	1,652	51.6	166	38.8-46.4*	6'-15'
11 GHz	682	25.1	99.7	33.7-49.8	4'-10'
18 GHz	318	11.9	48.1	30-48.5	8'
23 GHz	176	4.2	20	30-46.9	1'-4'

- 32 links > 130 km (80 mi.): all use 42-45.6 dBi gain antennas (10'-15')
- 313 links w/6' antennas: avg. len. 32 km, max 100 km

Spectrum Usage – What's Available

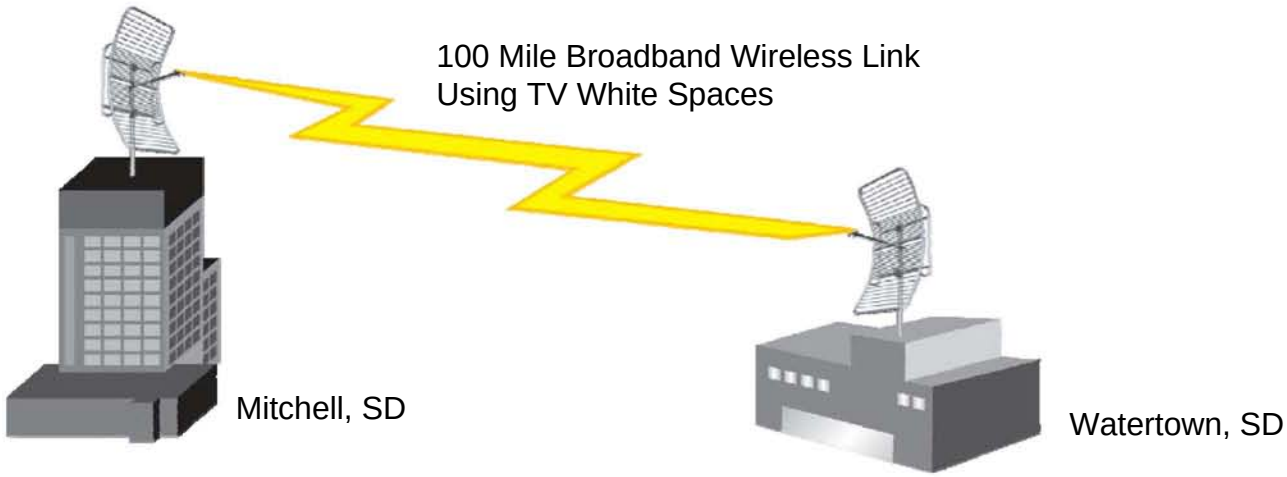
Frequencies	Typical Path Length	Maximum Channel Bandwidth	Maximum Channel Capacity (typical)	Minimum Dish Diameter	Typical Weight, including mount
400 – 700 MHz (in Progress)	30 - 75+ Miles	6 MHz	25 Mbps*	< 3x6 Ft (smaller available for different applications)	< 35 lbs
4 GHz	20+ Miles	20 MHz	DS-3+	8 Ft	500 lbs
6.1 GHz	20+ Miles	30 MHz	OC-3	6 Ft	360 lbs
6.7 GHz	20+ Miles	10 MHz	DS-3	6 Ft	360 lbs
10 GHz	10 Miles	5 MHz	16 x T1	2 Ft	33 lbs
11 GHz	8 Miles	40 MHz	OC-3	2 Ft	33 lbs
18 GHz	4 Miles	80 MHz	OC-3, OC-3+	2 Ft	33 lbs
23 GHz	2 Miles	50 MHz	OC-3	1 Ft	21 lbs
24 / 39 GHz	1.5 Miles	200-700 MHz	1 Gbps	9" (in market)	< 20 lbs

* Assumes 64 QAM. 50 Mbps achievable by using two 6 MHz TV channels or two antennas with different polarizations; > 40 Mbps may be achievable with 128 QAM over shorter distances

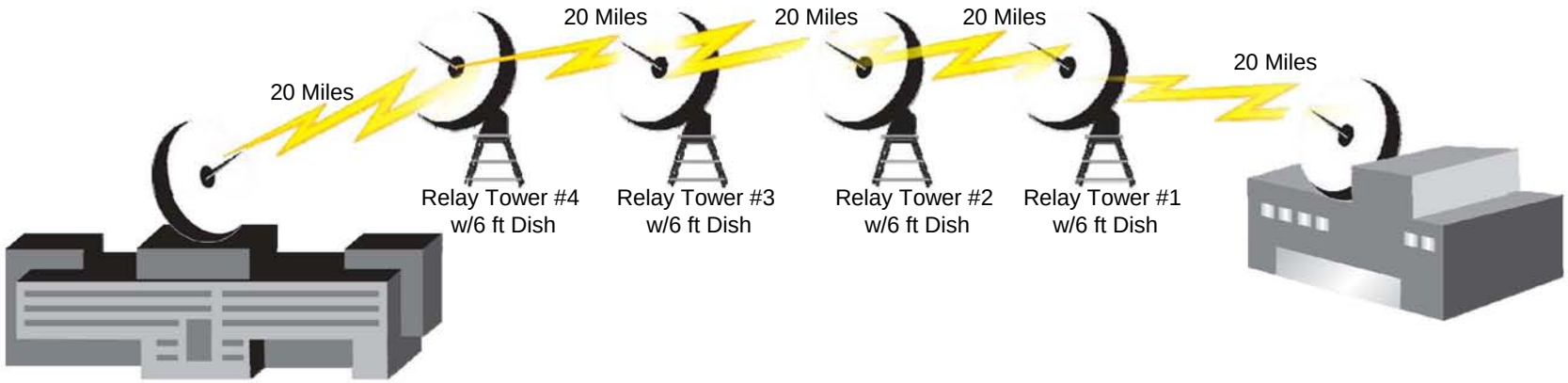
Data Rates

- When received signal-to-noise ratio is sufficient, links would be able to operate with up to 128 QAM (maximum data rate ~ 41 Mbps in 6 MHz channel)
  - 64 QAM likely to be more typical; max. data rate ~ 28 Mbps gross, and 20-25 Mbps net after coding
  - Rate could be doubled by using dual polarization
  - Rates could be less for longer links with low received signal-to-noise ratio

100 Mile Broadband Connection Comparison

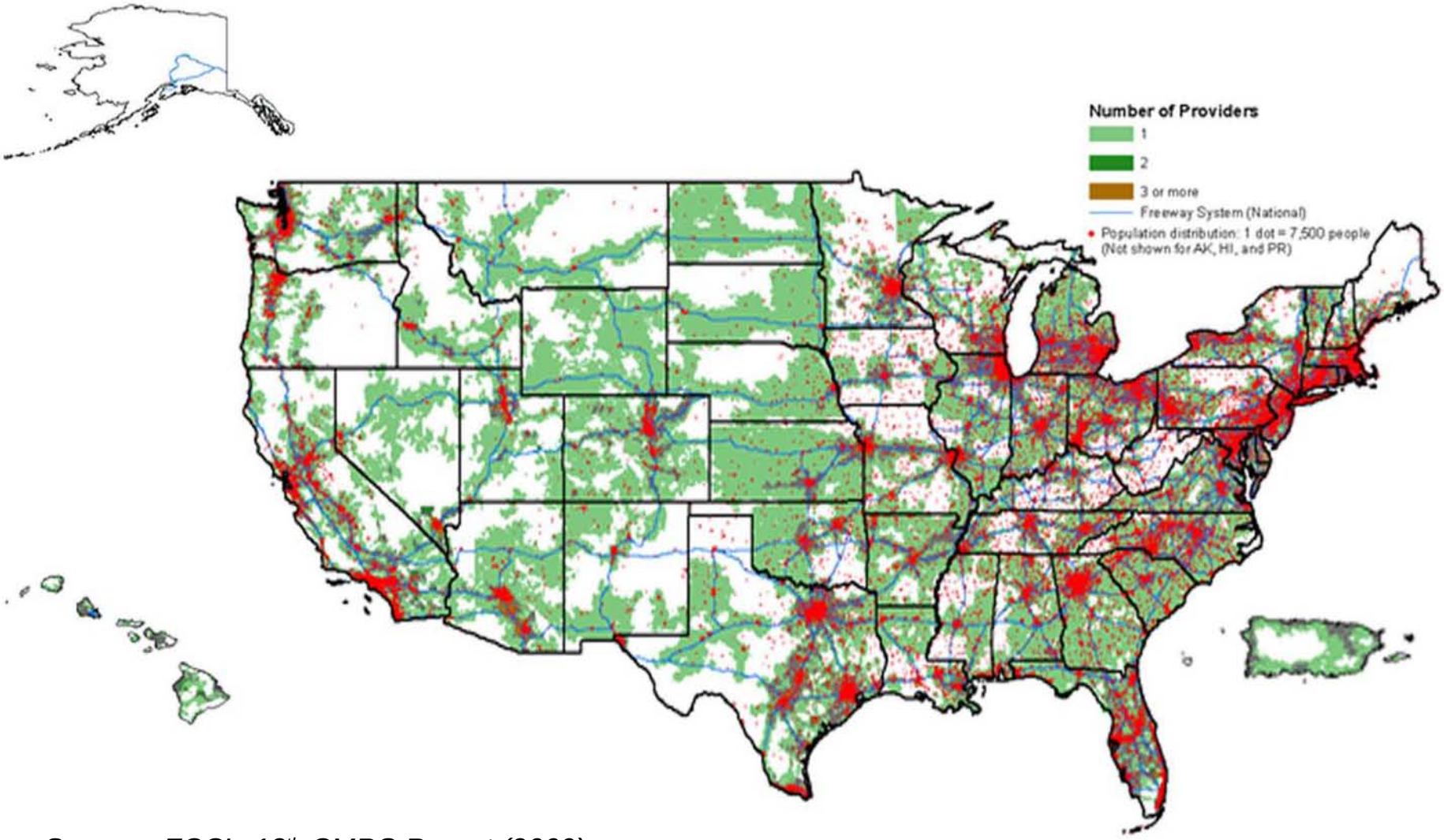


100 Miles using TV White Spaces (450-698 MHz): Small lightweight grill-style antenna fits on building/tower. Cost <$100,000 - $200,000



6 GHz or 3.65 GHz. Total cost: >$3 million. Fiber Optic costs even more!

Population Areas w/o Mobile Broadband



Source: *FCC's 13th CMRS Report (2009)*