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October 28, 2008

Ex Parte via Electronic Filing

Marlene H. Dortch
Office of the Secretary
Federal Communications Commission
445 12th Street, SW
Washington, D.C. 20554

Re: Authorized Ex Parte Contact – Unlicensed Operation in the TV Broadcast Bands (ET Docket No. 04-186); Additional Spectrum for Unlicensed Devices Below 900 MHz and In the 3 GHz Band (ET Docket No. 02-380)

Dear Ms. Dortch:

On October 27, 2008, Larry Alder and the undersigned from Google Inc. ("Google"), met with Charles Mathias, wireless legal advisor to Chairman Kevin Martin. The Google representatives expressed their strong support for the basic framework of the draft white spaces order, and urged a favorable vote on or before November 4th. During the course of the conversation, the Google representatives also explained the variable power proposal to establish the appropriate power levels for white space devices (WSDs) using channels adjacent to licensed digital television (DTV) signals. The attached presentation was shared with Commission staff.

Should you have any questions, please do not hesitate to contact the undersigned.

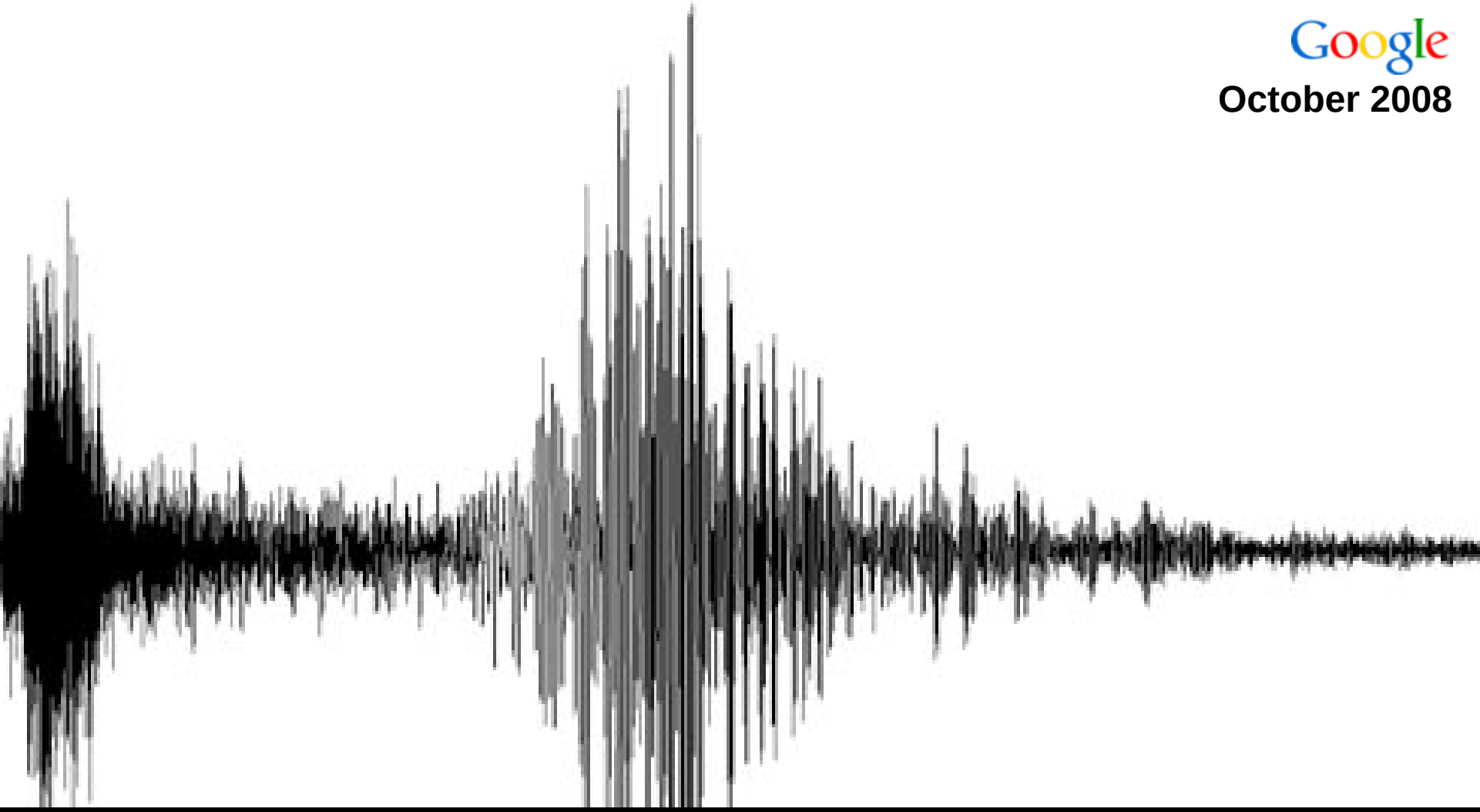
Respectfully submitted,

Richard S. Whitt, Esq.
Washington Telecom and
Media Counsel
Google Inc.

Attachment: Presentation, "White Spaces – October 2008"

Google

October 2008



White Spaces

White is the new wireless.

“The bottom line is that we have a potentially game changing technology in our sights ... ”

Senator John Kerry (D-MA)

Overview

To unleash the huge potential of "ubiquitous WiFi," Google urges swift approval of an FCC order to allow unlicensed use of TV white spaces.

- **Enables wireless broadband delivery:** The FCC's draft white spaces order adopts the right general framework.

  Unlicensed regime – opens up well-propagating spectrum bands and fosters innovation
  Personal/portable uses – drives economies of scale and low cost devices

- **Validated by OET:** The OET testing report correctly upheld WSDs using spectrum sensing and geo-location databases as viable protection mechanisms.
- **The time is now:** After over 4 years of careful FCC review and analysis, and numerous opportunities for public participation, now is the time for the United States to establish global leadership in this area -- to the ultimate benefit of innovation, economic growth, and most importantly the American consumer.

The white spaces order should not unnecessarily constrain the commercial feasibility of ubiquitous WiFi-like broadband service.

- **Proposed power limits in adjacent channels are too stringent.**

  A fixed 40mW power level on adjacent channels is unnecessarily restrictive. It will consign some large markets to no channels for broadband delivery, ruining the economic viability of ubiquitous broadband. This situation could be avoided by using other well-supported methods, including variable power controls.

- **Geo- location database must facilitate, and not foreclose, low cost unlicensed access.**

  Multiple providers of the database should be certified to provide the benefits of competition, including allowing entities to levy no charges for accessing the database.

Our Vision: Broadband WiFi

Combining the ubiquity of unlicensed WiFi-like technology

with

the strong propagation characteristics of white spaces spectrum

to create

a new wireless broadband alternative that reaches millions.

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What are White Spaces?

- The unused "white noise" channels that exist between the used broadcast TV channels is known as "White Space."
- When the TV stations move to digital transmission in February 2009, every one of the nation's 210 TV markets will have unused channels available.

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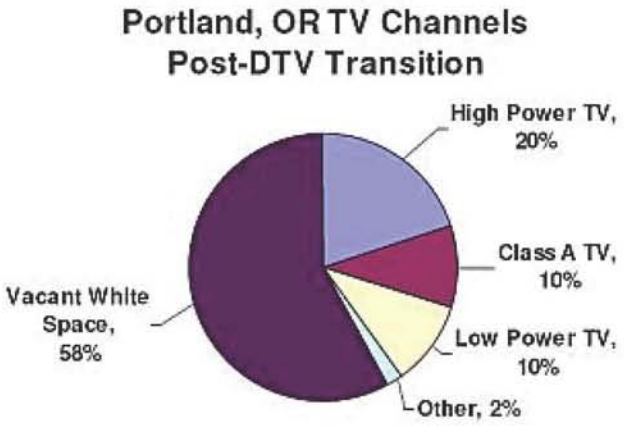
White Spaces: An Unused Resource

Summary Analysis – White Space in Sample of U.S. Media Markets

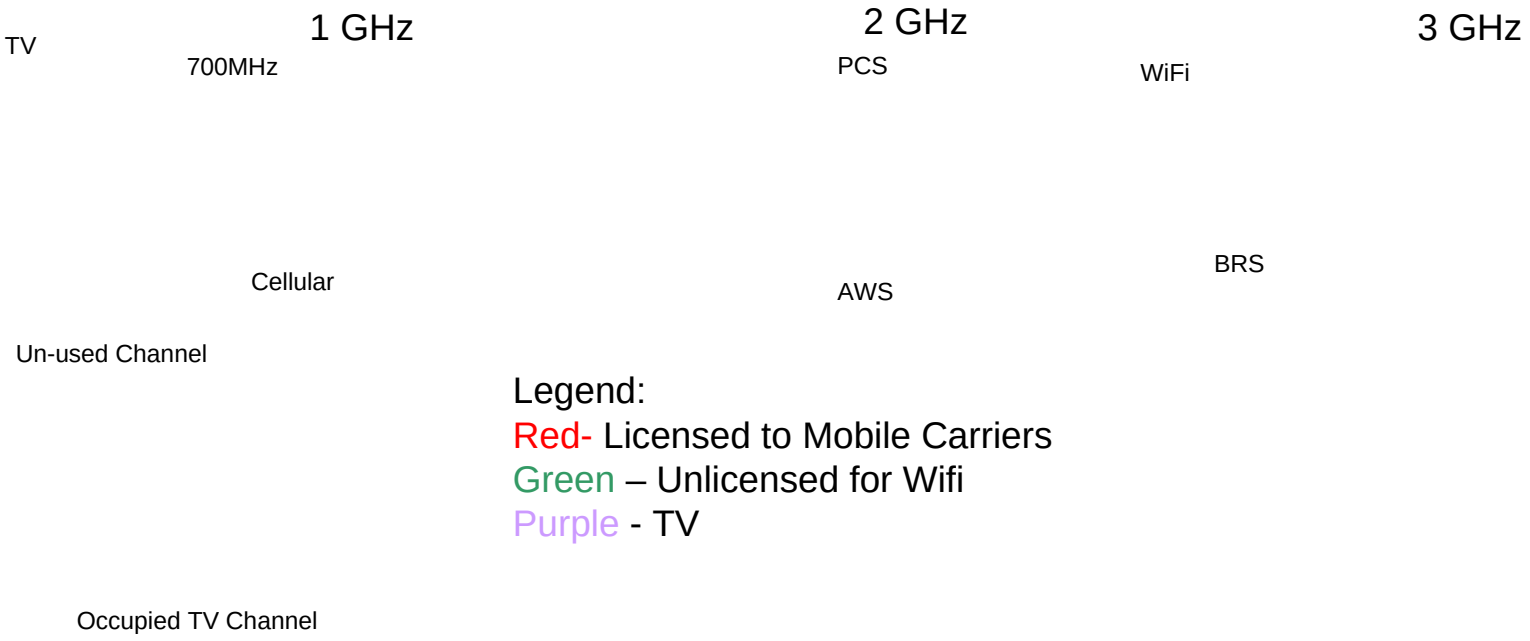
(The full analysis of each market with channel data is available at www.spectrumpolicy.org.)

Market	No. of Vacant Channels Between Chs. 2-51 After DTV Transition	Percent of TV Band Spectrum Vacant After DTV Transition
Juneau, Alaska	37	74%
Honolulu, Hawaii	31	62%
Phoenix, Arizona	22	44%
Charleston, West Virginia	36	72%
Helena, Montana	31	62%
Boston, Massachusetts	19	38%
Jackson, Mississippi	30	60%
Fargo, North Dakota	41	82%
Dallas-Ft. Worth, Texas	20	40%
San Francisco, California	19	37%
Portland, Maine	33	66%
Tallahassee, Florida	31	62%
Portland, Oregon	29	58%
Seattle, Washington	26	52%
Las Vegas, Nevada	26	52%
Trenton, New Jersey	15	30%
Richmond, Virginia	32	64%
Omaha, Nebraska	26	52%
Manchester, New Hampshire	23	46%
Little Rock, Arkansas	30	60%
Columbia, South Carolina	35	70%
Baton Rouge, Louisiana	22	44%



Stronger Propagation than WiFi

The DTV transition creates a unique opportunity to create unlicensed broadband spectrum below 1 GHz.



Legend:
Red- Licensed to Mobile Carriers
Green – Unlicensed for Wifi
Purple - TV

Lower frequency means better propagation characteristics, which is critical to ubiquitous deployment.

So What's the Big Deal?

The tremendous value of white spaces combines unique spectrum and enormous broadband potential.

1 Unique spectrum

- Tremendous propagation characteristics.
- Greatly under-utilized.
- Potentially ubiquitous coverage on unlicensed basis.

2 Enormous broadband potential

- Increased broadband competition in urban and suburban areas.
- First-time broadband access in many rural areas.

The end result: "WiFi on steroids"

“The commission has been studying for a long time how we can make more efficient use of the spectrum, how we can take advantage of the existing white spaces between broadcast channels ... This spectrum can be very conducive to broadband capability.”

FCC Chairman Kevin Martin

OET's Testing Report

The Office of Engineering and Technology (OET) testing report makes clear that the burden of "proof of concept" of WSDs has been met, and that unlicensed use can co-exist in the spectrum with Digital TV.

"We are satisfied that spectrum sensing in combination with geo-location and database access techniques can be used to authorize equipment today under appropriate technical standards and that issues regarding future development and approval of any additional devices, including devices relying on sensing alone, can be addressed."

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The FCC's Draft Decision

The FCC's proposed framework for white spaces is eminently sound, and the Commissioners should move forward quickly to adopt this order.

- ✓ Unlicensed regime makes the most sense.
- ✓ Personal/portable uses are a key aspect.
- ✓ Spectrum sensing and geo-location databases as "proof of concepts" are demonstrated by the OET report.
- ✓ Wireless microphone users are more than amply protected by spectrum sensing, numerous set-aside channels, and access to the geo-location database.
- ✓ Access to adjacent channels is allowed.
- ✓ Most proposed power limits are acceptable to allow a commercially viable "broadband WiFi" service offering.

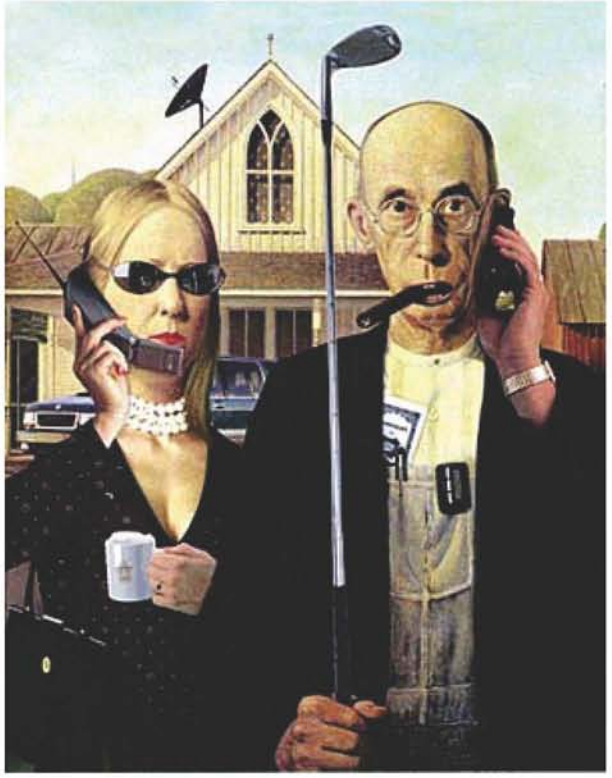
“It’s time to use [white spaces] to help more people access the internet and the communication and information it makes possible, especially in rural and underserved areas.”

Representative Jay Inslee (D-WA)

The Economics of White Spaces

White spaces has the potential to transform the broadband market by providing mobile broadband access to underserved markets.

The key is the ability to provide service ubiquitously across all types of users.



- Economic viability of rural markets depends on volumes generated in major markets.
- Rules must work for both rural and major markets.
- Unnecessary constraints on adjacent channel power levels could limit market opportunity in major markets.
- Thus, device volumes would be lower, creating higher costs which would constrain wide deployment in all areas.

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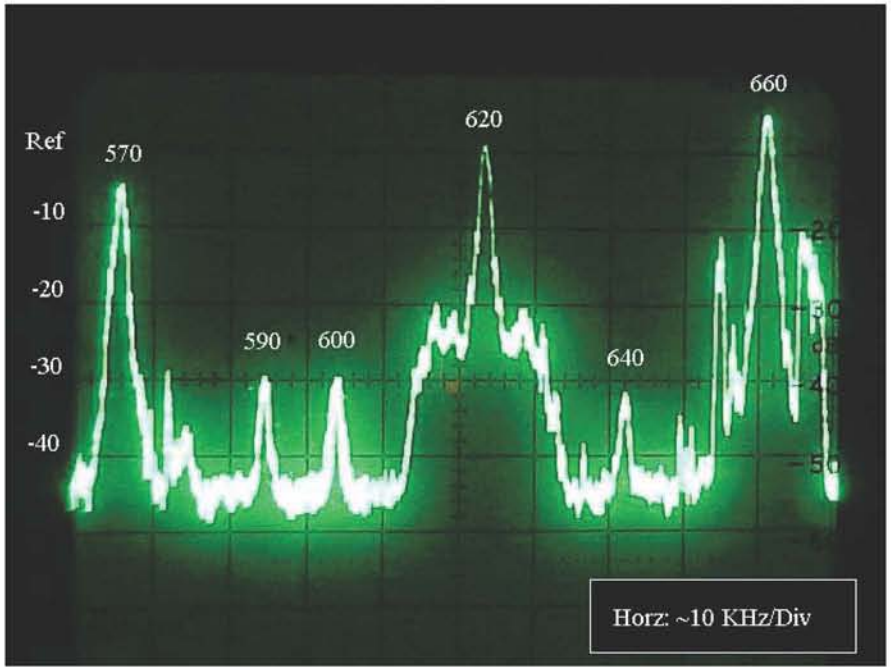
Every Channel Matters

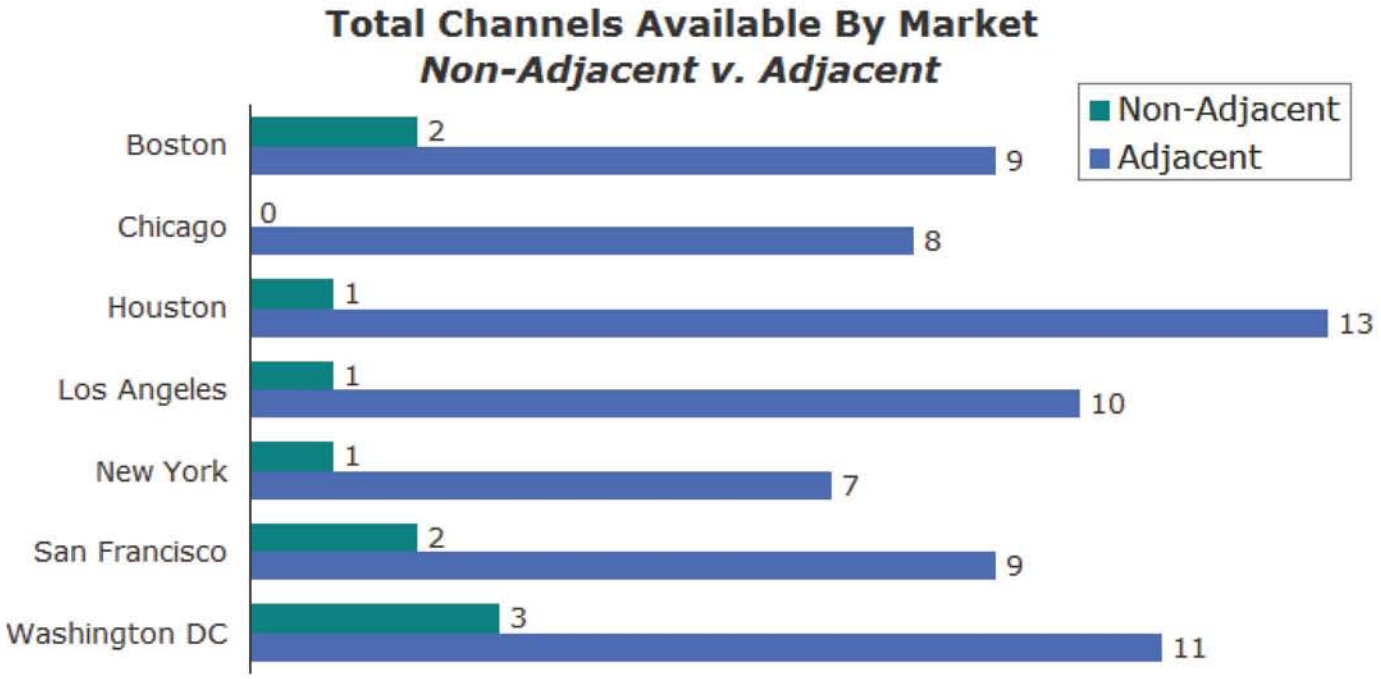
Especially in major markets, the ability to use every available channel – including those adjacent to DTV channels.



- A potential constraint on the viability of broadband WiFi is the amount of power allowed in empty channels adjoining licensed DTV channels.
- The empty adjacent channels in cities must be made available as an economic incentive to serve all geographic regions.
- Without reasonable power limits for those empty channels, the economic viability for ubiquitous broadband WiFi is destroyed.

Importance of Adjacent Channels

Virtually all white space channels in many major metropolitan areas are adjacent.



*Post-transition whitespace in Channels 21-36 and 38-51. Channels with digital TV signals greater than or equal to -85 dBm are considered occupied, as estimated by www.tvfool.com.

Google's Variable Power Proposal

Google recently filed a granular approach to adjacent channel power limits.

- Under Google's proposal, adjacent channels would be amply protected by "variable power" controls, using the geo-location database.
- By contrast, using a single fixed power limit of 40 mW for all adjacent channels is less granular.
- In particular, a fixed power limit of 40 mW obviates the ability to use most of the empty adjacent channel spectrum.
- At minimum, would-be broadband WiFi providers should have a future opportunity to rebut the presumption that a fixed power level is sufficiently granular, and that power levels above 40 mW would be harmful.

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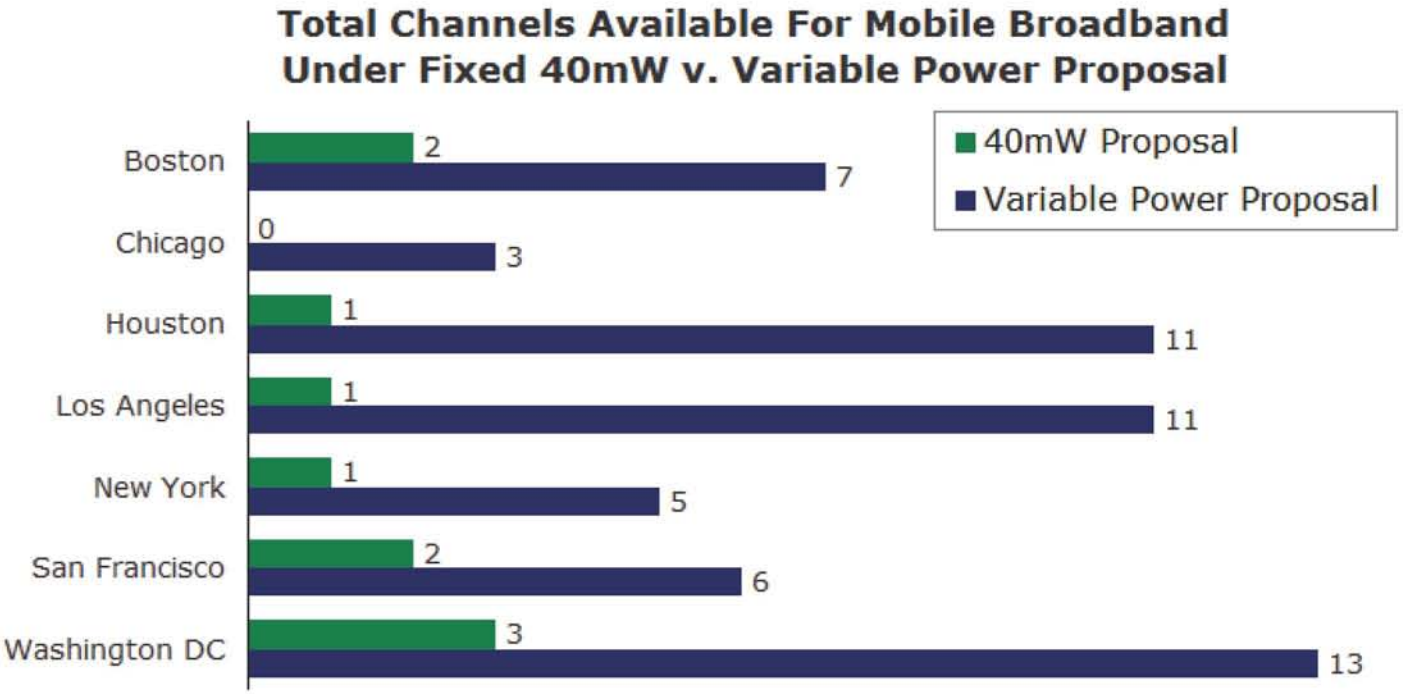
Google's Variable Power Proposal

Our variable power proposal unlocks far more spectrum for broadband WiFi.



* Post-transition whitespace in Channels 21-36 and 38-51. Channels with digital TV signals greater than or equal to -85 dBm are considered occupied, as estimated by www.tvfool.com. Assumes 1W required for mobile broadband.

Extent of Protected Areas

- The FCC's draft order proposes to adopt the "Grade B" contour as the outer bounds of the DTV operator's protected area.
- This approach is not a reasonable means of defining the protected area.
  - More granular, flexible, and scientifically-based approaches are available.
  - Many empty and otherwise usable channels would be eliminated from viable white spaces use.
- Google supports the Motorola proposal for a propagation model.

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Geo-location Database Operators

The draft order proposes a single nationwide provider of the geo-location database.

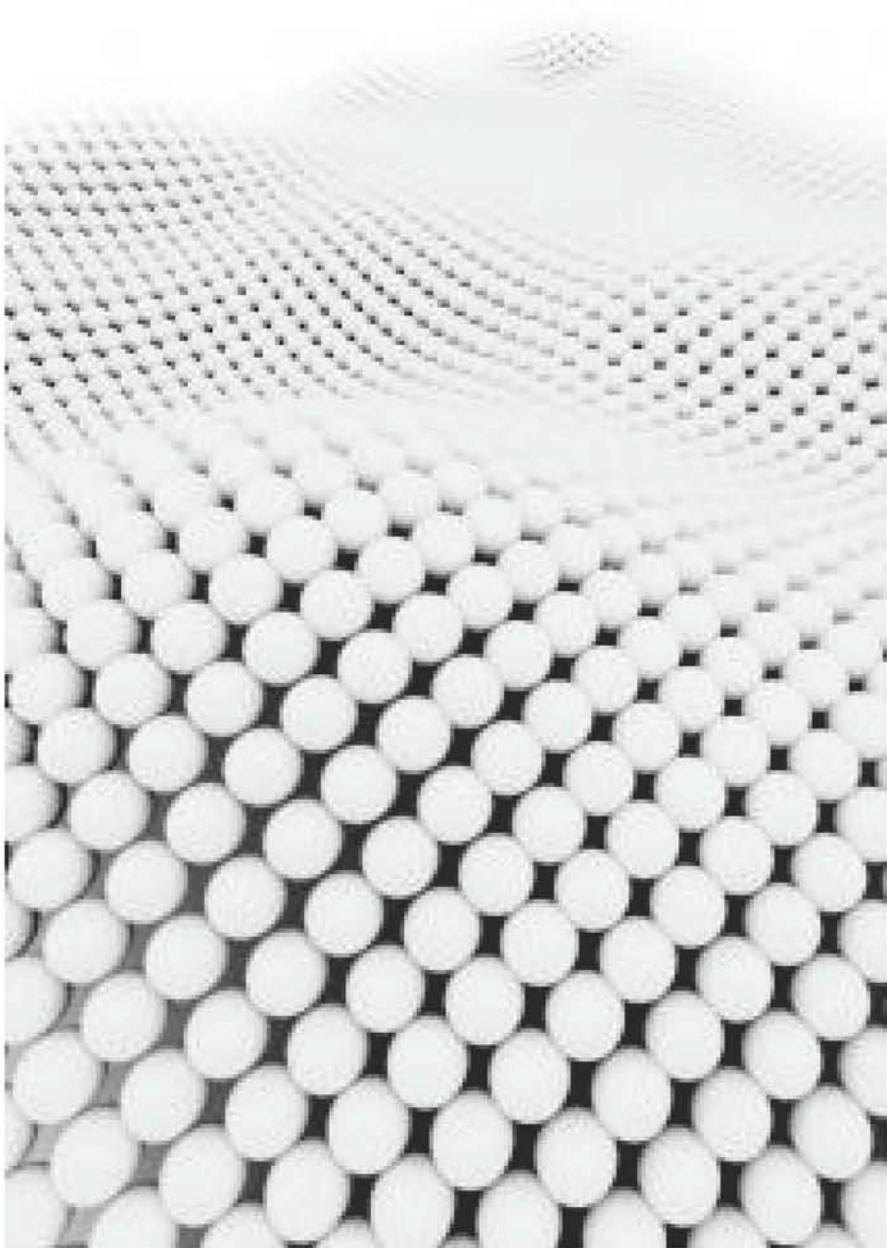
- Winner would be allowed to charge “just and reasonable” rates.

This proposed approach is flawed in at least two levels:

- Single, winner-take-all aspect forestalls competition.
- Ability to charge fees completely changes the nature of the consumer service.

Google proposes the competitive provisioning of multiple databases by multiple providers.

- FCC certification process could be utilized, with specified parameters such as common data inputs.
- Google seeks the ability to compete to become one of those providers.
- Google plans not to levy any fees on database users.



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A New Wireless Broadband Wave

Our Vision

The FCC has a unique opportunity to leverage unused spectrum to connect millions of Americans to the internet

The FCC should swiftly approve an order allowing unlicensed use of White Spaces to enable the exciting promise of ubiquitous WiFi.

The Future

The FCC's draft white spaces order adopts the right general framework.

The OET has confirmed that Digital TV channels that are in-use can be protected by leveraging spectrum sensing and geo-location databases.

Potential Constraints

At the same time, the FCC should ensure that the order does not unnecessarily constrain commercial feasibility of broadband WiFi service.

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“During a time of potential economic uncertainty in the retail markets, the FCC’s decision provides a glimmer of hope for an industry capable of beating a path to economic recovery.”

Representative Marsha Blackburn (R-TN)