Summary Report on the Google TV Band Database Public Trial

In accordance with Public Notice DA 13-297 in ET Docket No. 04-186, this document summarizes the 45-day public trial of the Google TV band database system. It identifies (1) all problems reported and their disposition and (2) changes made to the channel-availability calculator or registration system.

The trial was established to evaluate the following:

- The channel-availability calculator, and
- The registration utilities for cable headends, broadcast auxiliary temporary receive-sites, and wireless microphones.

The trial started on March 4, 2013, and was completed on April 17, 2013. During this period, almost 16,000 unique users visited the trial site, generating over 36,000 pageviews. Over 30% of all visits were from outside the USA. Attachment 1 provides a Google Analytics report that summarizes the overall activity.

Spectrum Bridge Inc. (SBI) provided the registration capabilities of the Google TV White Spaces (TVWS) database. Table 1, below, summarizes the registration activity during the public trial.

Registration Type	**Total**
Licensed Low-power Aux	12
MVPDs	1

Table 1. Trial Registrations

Attachment 2 gives a more detailed account of the registration records, while excluding personal data. All test/trial data will be removed from the system prior to live operation.

During the course of the trial, Google collected 42 feedback items and responded to those that contained email addresses. The feedback items, including responses, were provided weekly to the FCC during the trial.

After completion of the trial, Google made the following two updates to its TV Band database system in order to conform the system to clarifications of the Commission's requirements:

- Stop protecting licensed but silent (LICSL) entities, and
- When registering wireless microphones, do not allow selection of channels used by licensed services.

Neither update implicated the level of protection from interference that the database affords to licensed services and registered wireless microphones.

A discrepancy with already-certified TVWS databases (Spectrum Bridge and Telcordia) also was identified and corrected Specifically, when a Canadian transmitter record lists multiple antenna patterns, the Google database now uses the same antenna selection criteria as the other TVWS databases.

While most of the feedback items received during the trial contained general comments, a few contained questions about the rules. Responses to the questions provided clarification and direct links to the FCC rules, as appropriate. A summary of the feedback items and responses, after the removal of personal information, is provided in Attachment 3.

Attachment 1: Analytics Google.org Audience Overview 20130304-20130417
Attachment 2: Google TVWS Trial Registrations
Attachment 3: Feedback for FCC White Space Database Public Trial - Final 2013-04-18

Attachment 1

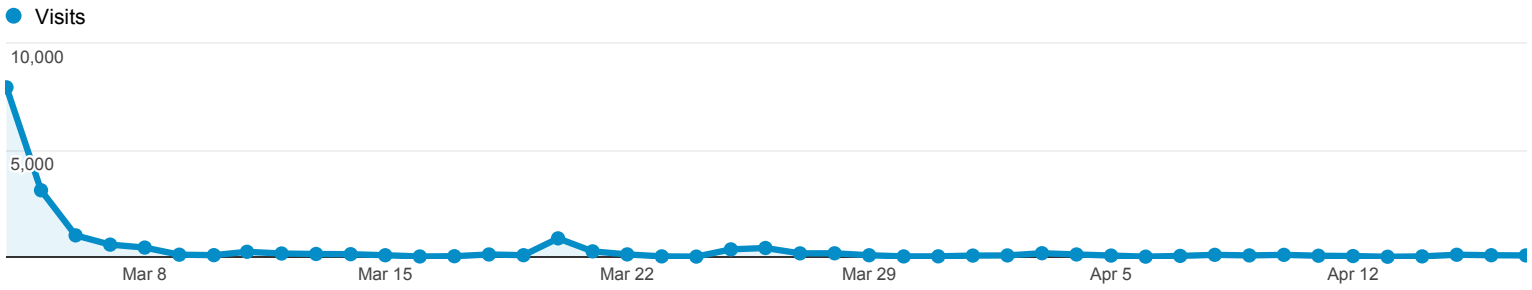
Spectrum Database - https://www.google.org
Google.org [DEFAULT]

Audience Overview

Mar 4, 2013 - Apr 17, 2013

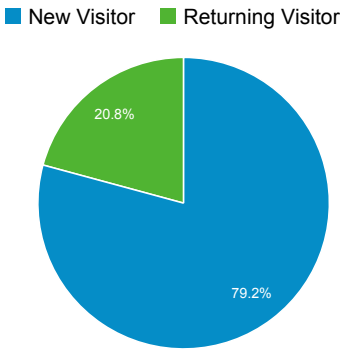
% of visits: 100.00%

Overview



15,992 people visited this site

Visits	18,874
Unique Visitors	15,992
Pageviews	36,136
Pages / Visit	1.91
Avg. Visit Duration	00:06:59
Bounce Rate	12.99%
% New Visits	78.98%



	Country / Territory	Visits	% Visits
1.	United States	13,165	69.75%
2.	United Kingdom	1,251	6.63%
3.	Canada	656	3.48%
4.	Spain	299	1.58%
5.	Japan	235	1.25%
6.	Australia	202	1.07%
7.	(not set)	200	1.06%
8.	Germany	195	1.03%
9.	Israel	195	1.03%
10.	France	185	0.98%

view full report

Attachment 2

Date Created	Type	Channel	State
4/3/2013 17:32:00	MVPD	29	ID
4/3/2013 17:11:00	Licensed Low Power Auxilary Stations	13,14,39,40,45,46	ID
3/25/2013 11:26:00	Licensed Low Power Auxilary Stations	14,16,19,20,23,24,25	MD
3/18/2013 20:03:00	Licensed Low Power Auxilary Stations	3,4,18,20,25,26,28,40,42,48,51	CA
3/17/2013 14:32:00	Licensed Low Power Auxilary Stations	42,43,44,45,46	NY
3/17/2013 13:20:00	Licensed Low Power Auxilary Stations	43,44,45,46,47,48	PA
3/17/2013 7:41:00	Licensed Low Power Auxilary Stations	19,26	NJ
3/17/2013 6:38:00	Licensed Low Power Auxilary Stations	19,26	NJ
3/13/2013 17:09:00	Licensed Low Power Auxilary Stations	2,3,4,5,6,7,8,9,10,11,12,13,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32	CA
3/12/2013 21:42:00	Licensed Low Power Auxilary Stations	4,18,20,25,26,28,38,40,42,48,51	CA
3/12/2013 10:46:00	Licensed Low Power Auxilary Stations	32,33,34,35,36,38,39,40,41,47,48,49,50,51	IL
3/12/2013 10:43:00	Licensed Low Power Auxilary Stations	31,32,33,34,35,36,38,39,40	IL
3/6/2013 2:43:00	Licensed Low Power Auxilary Stations	18,19,20,25,26,27,29,30,31,32,44,45	CA

Attachment 3

Date	Feedback	Response / Resolution
	" Section 15.712(b) of the rules provides that the receive sites of low power stations may be registered in the TVWS databases only if they are no farther than 80 km outside the nearest edge of the relevant contours, 47 C.F.R. § 15.712(b).... Waivers of this rule will be issued by the Commission in an Order. " Besides relay, which I can see is not protected, our station has viewers more than 80 km from the relevant contour, some who can receive no other OTA signal. Sigh.	Thank you for your interest in the Google Spectrum Database. The viewers' ability to receive your station will ultimately depend on the signal levels, antennae configurations, etc., for their particular situations. It is hard to say how much, if any, degradation they will see from white space devices.
4/12/2013	Hello and thank you for your comments. Of course, you are correct. Ultimately interference depends upon all the factors you mention, including the ERP of the WS and digital broadcast transmission, its antenna configuration, path loss including vegetation, local noise generated near the receiving site such as computer noise or power line corona (assuming the recipient is on the grid, which many are not). When there is interference to reception at a retransmission site, such as K09XO, it will interrupt the rebroadcast. When a distant recipient of the broadcast (be it audio/visual or some other digital data) all the recipient will experience is loss of signal. There will be no indication as to why. Hand shaking between broadcast and WS link devices was not included in the protocol. We have reports of reception beyond 200 km. We have had reports from distant, roadless, off grid, very rural areas where no other broadcast signals can be received. Can you suggest a cure?	We've discussed your question with the FCC and [they] suggested that you contact [email] directly to see if the Waiver process would apply to your configuration. Thanks again for your interest in the Google Spectrum Database.
4/9/2013	Google data download and Available Spectrum channel list does appear to identify or protect identify the MVPD stations that are more than 80 km outside the protected contour of the TV stations that they receive stations that they receive and were granted waivers. See DA 12-845	Acknowledged
4/9/2013	MVPD Data file appears corrupted. Within the downloadable data file the event_start and event_end fields contain contact information, not dates.	Cannot reproduce.
4/4/2013	Since Google uses the Spectrum Bridge system for all registrations it seems that Google should have an interest in the security and robustness of that system. There appear to be some issues with the Spectrum Bridge system which might warrant attention: No user authentication: The Spectrum Bridge system does not implement any form of user authentication or reasonably attempt to prevent unauthorized parties from corrupting their White Space database through bogus or invalid registrations. One assumes, since the Google database is slaved to the Spectrum Bridge database, that corruption of the latter would necessarily affect the former. Enabling anonymous registrations is an egregious security risk. This is made worse by no protection against robot-registrations and other scripted forms of abuse (e.g. by requiring user puzzle) in the Spectrum Bridge registration forms. Wireless Microphone registrations on unavailable channels:The Spectrum Bridge system does not calculate and present available wireless microphone channels at the user location nor does it preclude users from registering wireless microphone channels that are not available at their location.	We have discussed the concerns regarding the registration process with the FCC, and they have agreed that no immediate action is required. We do recognize, however, that improvements can be made to reduce abuse, such as from robot registrations, and will explore implementing added measures. Regarding wireless microphones: The FCC has made the determination recently to not allow wireless mic registrations on channels used by licensed services, even though it would not change the protection of licensed services and wireless mics from TVWS services. We will work with Spectrum Bridge to make the necessary adjustments
4/4/2013	Nationwide the Google system shows "Radio Astronomy" as blocking channels 36, 37, and 38 - this should only block 37. It appears you are blocking adjacent channels. Google does not provide the following information on your portal. It is therefore not possible to determine whether your channel calculator is using a HAAT value consistent with Spectrum Bridge, Telcordia or Key Bridge. - Elevation at the query location in meters AMSL - Height above average terrain at the query location in meters Finally, Google does not indicate channels available for wireless microphone registration. However, since Google uses the Spectrum Bridge system for all registrations you probably do not need to do this.	Radio Astronomy: Actually, adjacent channels must be protected. Please see CFR47.15.712.f.2, which reads: TVBDs are not permitted to operate on the first channel on each side of TV channel 37 (608-614 MHz) that is not occupied by a licensed service. HAAT: Google, Spectrum Bridge, Telcordia, and others have worked hard to make sure our terrain-handling procedures and contour calculations are in agreement. The WSDB Providers working group has published detailed procedures and results demonstrating near identical computation results. (http://apps.fcc.gov/ecfs/comment/view?id=6017169577) Available wireless microphones: The primary goal of the browser view in Google Spectrum Database is for exploration of available channels for white space devices. Available channels for wireless microphones falls under a different use case.
4/3/2013	Hi! Why isn't the duration of using a white space channel shown as part of the search results? [name]	Thank you for your interest in the Google Spectrum Database. In general, channel availability is a schedule of on/off times, rather than a single duration, on a per-channel basis. Determining how to display this information in a clear, elegant way is a feature we are considering for the future.

Date	Feedback	Response / Resolution
4/1/2013	I want to know how the WS channels are calculated at a given location. Are you using a radio propagation model with the data of TV stations? Or some other methods? Please reply to me if possible. Thank you very much!	Thank you for your interest in the Google Spectrum Database. An overview of the FCC protection rules can be found at: http://www.fcc.gov/encyclopedia/white-space-database-administrators-guide. In general, the rules can be quite complex, taking into account many factors, including transmission type, antenna pattern, power levels, terrain, etc. The details of the FCC rules can be found at: http://www.ecfr.gov/cgi-bin/text-idx?rgn=div6&view=text&node=47:1.0.1.1.16.8. See, particular, Section 15.712.
3/29/2013	Hogy visszajelzést adjanak a Google Spectrum Database	Köszönjük, hogy érdeklődik a Google Spectrum Database iránt.
3/30/2013	First, I am a consulting engineer in the RF and microwave world. I design wireless gadgets, receivers and antennas. I am confused by the color scheme. For zip [zip code] is shows some orange for a fixed antenna at 10 & 15 M, for portable it shows green. Is this a usable or unusable channel? Is it a virtual channel? Can't be virtual, as our local ch22 is now on real channel 11, which I believe is the green color. Then why can't we use he plethora of unused UHF channels? Yes, VHF channels will provide somewhat more range, but is that good? Think of the interference. I believe you need a explanation of what I am looking at. I would be willing to look again, just ask in an email. [name] [company] [phone]	Thank you for your interest in the Google Spectrum Database. There can be many white space channels available for any given location (see FCC white space rules (http://www.ecfr.gov/cgi-bin/text-idx?rgn=div6&view=text&node=47:1.0.1.1.16.8). The colors on the map indicate the number (count) of available TV white space channels in a given area, rather than individual channel numbers. It is intended to give an quick overview of channel availability in a regions, e.g., green means many. In order to find out which specific channels are available for a given location, fill in the form and press the "Search" button. This will display a table with all channels and their availability. For channels that are unavailable, the table also lists transmitters or sites that have been protected, preventing white space operation. Hopefully this clears up some of the confusion.
3/26/2013	I am very interested to have the school I am teaching at as a pioneer school for Google White Spaces in Johannesburg South Africa. How do we go about becoming a pilot school please? Hear from you soon. Kind regards [name]	Thank you for your interest in the Google Spectrum Database. Our trial license in South Africa is currently limited to serving schools around Tygerburg hospital in Cape Town. There currently are no plans to add schools or locations to the trial. For more information on the Cape Town trial and partner information, please see our blog post at http://blog.google.org/2013/03/tv-white-spaces-trial-launches-in-south.html.
3/26/2013	Hello i a radio engineer in Nord-Italy. I'm working in frequency monitoring. If i can help you to discover some white space in my area let me know.	Thank you for your interest in the Google Spectrum Database. We hope the results of our efforts will drive similar regulatory developments in other countries, including italy.
3/25/2013	Dear sir/madam, Since I am a researcher in TU Delft, the Netherlands, working on cognitive radio networks, especially in IEEE 802.22 networks. My work is highly connect to the TVWSs reusing. Hence, I am extremely curious about the protocols and deploy of the trial in South Africa. Is IEEE 802.22 used in this trial? What is the size and density of the network? Which type of antennas are used for both BS and CPEs? Do you have an introduction of the trial setup? Can you also provide an email address or name that I can discuss with? Thank you for your help in advance. Your answers would help me a lot in my work, and you might be interested in my work too.	Thank you for your interest in the Google Spectrum Database. The South Africa white space trials in Cape Town involve many partners. For more information, please see our blog post at http://blog.google.org/2013/03/tv-white-spaces-trial-launches-in-south.html.
3/23/2013	I have several 16 open in my area [zipcode] when can I hook up?	Thank you for your interest in the Google Spectrum Database. Currently, there are a few FCC authorized White Space devices for operation as "fixed" devices, but none has been authorized as a "portable" device. Commercial availability of these devices is contingent on compliance with the FCC rules, including interaction with certified White Spaces databases. Suggested internet search term: "white space radio"

Date	Feedback	Response / Resolution
3/22/2013	Just check your results with Spectrum Bridge and Key Bridge for Buffalo, NY (42.886447 and -78.878369) and they differ slightly. You indicate channel 42 is available for low power personal/portable and the other databases do not.	Thank you for your interest in the Google Spectrum Database, and thank you for bringing this issue to our attention. The discrepancy you noted may occur when computing the protection for Canadian transmitters that are listed with multiple antenna patterns. In this particular case, the transmitter is CKVP-DT on Channel 42. We have worked with the other certified database providers to agree on the antenna-selection criteria to avoid this discrepancy in the future. We will upgrade our system. Please note that this issue does not occur for US transmitters.
3/18/2013	Hello, I would like to know what are the protection rules used for DTT reception and White Space base station and user ?	Thank you for your interest in the Google Spectrum Database. An overview of the FCC protection rules can be found at: http://www.fcc.gov/encyclopedia/white-space-database-administrators-guide. In general, the rules can be quite complex, taking into account many factors, including transmission type, antenna pattern, power levels, terrain, etc. On the other hand, White Space devices, including base stations, are designated as unlicensed devices and will have to share TV white space channels with other TV band devices. Per the FCC rules, there is no process for reserving or licensing white space channels.
3/8/2013	What will be the fees, if any, for use of this database going forward for obtaining list of available channels and/or registering devices to use those channels.	Thank you again for your interest in the Google Spectrum Database. The current public trial is just one step towards full FCC certification of our TV white space database. We do not have any information to share about commercial plans at this time.
3/6/2013	I tried the white space app and entered my approximate home location. The database result shows 3 channels (22,23,24) of available white space. This greatly concerns me since I'm receiving KRCB (channel 23, virtual channel 22) with a roof mounted antenna. I'm afraid that if the database is not corrected I'm going to loose one of the few stations actually worth watching. What needs to be done to get KRCB entered into the white space database ? Is there anything I can do if white space devices interfere with my TV viewing ?	Thank you for your interest in the Google Spectrum Database. According to FCC regulations, TV stations do not get white space protection outside of their service contour. Your ability to receive KRCB will ultimately depend on the signal levels for your particular situation, so it's hard to say how much, if any, degradation you will see from white space devices.
	Tried to register this morning...asked to correct errors in automated search input...how to do that?	Thank you for your interest in the Google Spectrum Database. We are unable to duplicate the error with the information provided. Please try your input again. Should you continue to have issues with this, please send a screen shot of the input screen with the error. Also please include details on the browser you are using. Can you tell us what type of protected entity you were trying to register? Thanks.
3/5/2013	It was for MVPD. Channel 23 Power [dbm] 16 KTVP-LD:LD South Mountain, Phoenix AZ (Gave coordinates of home)	Thank you clarifying what you're trying to do. I believe there might be a misunderstanding of the White Space rules. The Spectrum Database needs to protect licensed users of spectrum. In this case, KTVP-LD operates on channel 22, so no White Space devices may operate using that channel at your location. As a potential White Space user, however: You may operate on the adjacent channels, 21 and 23, at a lower power of 16dBm, or any of the 9 other available channels at your location (at varying power levels) You do *not* need to register with the database. You do need a certified White Space device, which will be able to use one of the available channels Commercial availability of White Space devices, however, is contingent on FCC certification. Not many exist yet. In short, the Google Spectrum Database's Browse Spectrum page shows you the potential White Space availability at your location. No registration needed.

Date	Feedback	Response / Resolution
	Then, I have misunderstood...I don't even know what a White Space device is. I thought it was my Chromebook. But I'll Google White Space device, and maybe then, try again.	Closed
3/5/2013	Some of the channels you list as open white space currently provide perfectly fine TV signals at my location (Grass Valley, CA). I'm on top of a hill with clear line of sight to the San Francisco transmitters, using a rooftop VHF/UHF antenna. The channels are: KQED RF-30, Virtual 9.1 KTVU RF-44, Virtual 2.1 KNTV RF-12, Virtual 12.1 KOFY RF-19, Virtual 20.1	Thank you for your interest in the Google Spectrum Database. According to FCC regulations, TV stations do not get white space protection outside of their service contour. Your ability to receive San Francisco stations will ultimately depend on the signal levels for your particular situation, so it's hard to say how much, if any, degradation you will see from white space devices.
3/9/2013	I see how to browse spectrum available in the area. How do I register as a user of the site and how do I inquire to use the availalble spectrum in my area?	Thank you for your interest in Spectrum Database. The Google Spectrum Database is made available to the public during the 45-day trial as part of the FCC certification process (http://transition.fcc.gov/Daily_Releases/Daily_Business/2013/db0227/DA-13-297A1.pdf). No registration is needed. On the "Browse Spectrum" page, just enter your address and click the "Search" button to see available channels. To make use of available spectrum requires FCC authorized White Space devices, which undergo a separate certification process. Commercial availability of these devices is contingent on compliance with the FCC rules, including interaction with certified White Spaces databases. Certified white space devices are allowed to use any available channel reported by a white space database
3/7/2013	I have downloaded and looked at the database for the BAS operators in the US. This list does not seem to include all the BAS operators in the US. Is there any reason for that?	Thank you for your interest in the Google Spectrum Database. The file you downloaded contains the "BAS links" that must be protected by the white space database. These are sites that receive signals over a TV channel and thus need protection for the gap between the transmitter and the receiver. BAS links that operate on non-TV frequencies do not impact TV-band white space operations, so they will not be included in this list.
3/6/2013	It would be really awesome if Spectrum Database could list the dBm power of every licensed broadcast, given the address. This would greatly help in estimating how many wireless microphone systems could be used at a given address. Thanks!	Thank you for your interest in the Google Spectrum Database and suggestion. Yes, we have the ability to compute expected power levels, but this is not part of the service we are offering at this time. We will certainly consider this possibility for future service offerings.
3/6/2013	This is great and exciting that Google has take the initiative to put this together. GREAT JOB!!! Oak Ridge National Lab has a population information in 1km pixels that I think would be key to overlay with this to determine what the bandwidth footprint actually is. Please contact me if you have any questions.	Acknowledged
3/6/2013	I note that here in Lincroft, NJ This database agrees with Spectrum Bridge's except for the fact that Spectrum Bridge reports that wireless microphones have channels 5,9,10,29,32 as well as the two that Google Spectrum identifies, namely: 35 and 39. This close to NYC the overlapping coverage map is useless. It might be better to plot the area with the select channels available, to give a sense of geographic sensitivity to the channel selections. Good luck with your efforts.	Thank you for your interest in the Google Spectrum Database and suggestions.
3/6/2013	Two devices, device 1 connected to internet and device 2 remote not connected to internet but within range of and intended to communicate to device 1. Device 1 can query database to determine which channel to use, but how does device 2 dynamically allocate to select the channel to communicate to device 1? Does device 2 have to scan all channels or does device 1 send the information to device 2 on a predefined channel.	Thank you for your interest in the Google Spectrum Database. Please consult the regulation for detailed requirements for white space device operations (http://www.ecfr.gov/cgi-bin/text-idx?rgn=div6&view=text&node=47:1.0.1.1.16.8) A white space database does not determine how white space devices communicate with each other.
3/6/2013	How often does a portable device need to check the database? Such as if move so many feet or every minute.	Thank you for your interest in the Google Spectrum Database. In general, for a portable device that has location-sensing capability, it must check the database: When it powers up When it moves more than 100 meters Daily, if it does not move Please consult the regulation for white space device operations for detailed requirements: http://www.ecfr.gov/cgi-bin/text-idx?rgn=div6&view=text&node=47:1.0.1.1.16.8#47:1.0.1.1.16.8.235.7

Date	Feedback	Response / Resolution
3/6/2013	Medford & Grants Pass Oregon area looks wrong (fixed device). How can this low density area have less whitespace than anywhere else in Oregon or Washington, and about as much zero-whitespace (area wise) as the Bay Area, CA?	No reply email
3/6/2013	Very cool.	Acknowledged
3/5/2013	I like the ease of use and the detailed visual map is very nice. Very easy to understand and to see immediately the usage in any given area Much better than telcordia or spectrum bridge and as a whitespace developer, I would like to see access to the databases open and free, not like what those other guys are doing. Small companies like myself don't stand a chance if we cant get database administrators to see this information for the free public information that it is and not try to monopolize it to secure a share in the future market.. Great job Google	Acknowledged
3/5/2013	How will rual tv viewers in deep fringe areas out pass the grade B contor areas get protection for fringe signals? I see where cable headends can get protection but where do viewers enter sites to get protection?	No reply email
3/5/2013	You list no cable systems. High power output on tv channels will blead into cable systems. Those systems should be included in the database to keep users near them from transmitting.	No reply email
3/5/2013	Low power channels in louisiana are not in your database. Example ch4 winnfield la. Ch 4 . Also dish network uses UHF modulators in its second tvv receivers not ch 3/4 how will those receivers be protected from interfrence?	No reply email
3/5/2013	I had a look at the Buffalo NY area and I am wondering if the database takes into account the Canadian signals from Niagara, Hamilton and Toronto areas. It seems to no be including these.	Thank you for your interest in the Google Spectrum Database. Canadian TV stations are being considered in white space calculations, but, in accordance with FCC white space regulations, their protection is limited to areas within several kilometers of the US-Canadian border.
3/5/2013	I think this will bring faster inter net in my area where I have very slow internet. I would look forward to see how this all plays out I'm very excited	Acknowledged
3/4/2013	The National Radio Quiet Zone is not noted in the database. I suspect that fixed stations probably would violate the NRQZ?	Thank you for your interest in the Google Spectrum Database. The National Telecommunications and Information Administration (NTIA) is responsible for administering the National Radio Quiet Zone, and they require a 2 km keep-out zone around the radio astronomy receive sites, which the white space databases are already implementing.
	The color bar/scale at the top says "WS Channels", which gives the impression that the color bar/scale refers to the Channel #, and not the Quantity of channels that are available. I know that is what it means, but it is not very clear. Also, if there can be a mouse over pop-up with "Absolute UHF Channel #" when the pointer hover's over the map, that'd be very helpful. There should also be a map full screen option to look at the map closely. Would it be possible to export the contour in KML or TAB (for MapInfo) in the future?	Thank you for your interest in the Google Spectrum Database and suggestions. 1) Legend: The current legend resulted from some trade-offs between clarity and size constraints imposed by the layout. 2) Hover text: Having actual channel numbers show up on mouse hover is not technically feasible. Nearly every pixel on the map might have a unique list of channels, and this would make for an impractically large mouse-over map to include this data. 3) Contour downloads: This is a feature request that will be considered after the 45-day public trial.
	Thanks for getting back to me. Two more question/comment. 1. Can a map full screen (or larger) option possible? 2. Why is there a zoom limit for the contours? Is it a technical limitation of the design, or a UI decision on Google's part?	Thank you again for your suggestions. 1) Great suggestion. This is a feature request that will be considered after the 45-day public trial. 2) The zoom limit is a technical trade-off. The size of the imagery grows exponentially with higher zoom levels, so this is a compromise during the 45-day public trial.
3/4/2013	Thanks. I will send more feedback down the road. So far, your product is easier/simpler and more user friendly than the other two public WS DBs out there. Also, I really appreciate a big company replying and acknowledging user feedback.	Closed
3/4/2013	Is there any restrictions near the Canadian border? In Buffalo NY I found spectrum that might would get into Canada	Thank you for your interest in the Google Spectrum Database. According to the FCC White Space rules, both US and Canadian TV stations are protected near the Canadian border. White space devices operate at low power and have large buffer zones such that signal interference going across the border should be minimal.
3/4/2013	As equipment manufactures i am impressed with the Data Base being created and believe that it is important for an organization that can expedite the whole project.	Acknowledged

Date	Feedback	Response / Resolution
	Do you have aggregate data available by DMA? (as opposed to geographic coordinates)	Thank you for your interest in the Google Spectrum Database. The short answer is, "No". The database calculates white space availability for a given location (point) and device type, in accordance to the rules specified by the FCC. White space availability over a large area (like a DMA) is not well defined, since this could include a lot of different answers for various points within the area of interest.
3/4/2013	I very much appreciate your response, but if I could just trouble you for just one further question, is it possible that at least some of the same white space spectra may be consistently available over each distinct DMA?	Thank you again for your interest in the Spectrum Database. It is certainly possible that some TV channels are unoccupied over large areas. The main reason that spectrum databases exist is to try and open these underutilized resources for public use. It's still a complex issue to talk about aggregate white space availability across an entire DMA. A typical DMA can contain over 100 protected spectrum users (TV broadcasts, translators, etc.). They can carve up the available white space in an almost uncountable number of ways, so the analysis really depends on what metrics you're looking for. The data can be aggregated in a lot of different ways like by population, by area covered, by specific channel numbers, by total free MHz, etc. One more thing to note is that the FCC's databases are being updated all the time. This means that white space availability is also changing all the time. These are all interesting areas for study, but unfortunately we do not have any prepared data of this kind for download.
3/4/2013	guys: in your explanation section I recommend changing this sentence: 1.What is spectrum? Spectrum refers to the range of electromagnetic wavelengths. Spectrum is arranged from shorter to longer wavelength, and from low to high frequency. to this sentence, just to keep the physics straight: Spectrum refers to the range of electromagnetic wavelengths. Spectrum is arranged from LONGER to SHORTER wavelength, and from low to high frequency.	FAQ editied and updated. Responded 2013-03-07
3/4/2013	This tool is just what I need to identify available spectrum in Upstate NY. Looking for partner(s) to delivery mobile wireless in the Adirondacks.	Acknowledged