

**Before the
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF ENGINEERING AND TECHNOLOGY
Washington, D.C. 20554**

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| In the Matter of |) | |
| |) | |
| Office of Engineering and Technology Releases and |) | ET Docket No. 13-26 |
| Seeks Comment on Updated OET-69 Software |) | GN Docket No. 12-268 |

To: The Office of Engineering and Technology

**REPLY OF
THE NATIONAL ASSOCIATION OF BROADCASTERS, FOX ENTERTAINMENT
GROUP, CBS CORPORATION, NBCUNIVERSAL, LLC, ABC OWNED TELEVISION
STATIONS, ABC TELEVISION AFFILIATES ASSOCIATION, CBS TELEVISION
NETWORK AFFILIATES ASSOCIATION, FBC TELEVISION AFFILIATES
ASSOCIATION, AND NBC TELEVISION AFFILIATES**

April 5, 2013

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Executive Summary

The National Association of Broadcasters (“NAB”), Fox Entertainment Group, CBS Corporation, NBCUniversal, ABC Owned Television Stations, ABC Television Affiliates Association, CBS Television Network Affiliates Association, FBC Television Affiliates Association, and NBC Television Affiliates (collectively, “the Joint Broadcasters”) respectfully submit this reply to comments on the Office of Engineering and Technology’s (“OET”) proposal to use a modified OET-69 methodology, referred to as *TVStudy*, in conjunction with the impending incentive auction of broadcast television spectrum. The Joint Broadcasters strongly object to OET’s proposal because it is expressly forbidden by Section 6403(b)(2) of the Spectrum Act; because it violates regulations requiring that any such changes be made by the full Commission following formal notice and comment; and because it constitutes arbitrary and capricious agency action for the reasons set forth in the Joint Broadcasters’ opening submission.

It is little surprise that several of the commenters supporting OET’s use of a modified OET-69 methodology represent members of the wireless community who stand to benefit from reductions in broadcasters’ predicted coverage areas and populations served; such reductions would enable the Commission to more tightly “repack” broadcast channels and appropriate a larger swath of spectrum for wireless providers, to the detriment of broadcasters and their viewers. To foreclose this eventuality, Congress expressly directed the Commission to use “all reasonable efforts” to “preserve, as of [February 22, 2012], the coverage area and population served of each broadcast television licensee, as determined using the methodology described in OET Bulletin 69.”¹ But the Commission cannot “preserve” values calculated as of February 22,

¹ Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. 112-96, 126 Stat. 156, § 6403(b)(2) (Feb. 22, 2012) (codified at 47 U.S.C. § 1452(b)(2)) (“Spectrum Act”).

2012 using a methodology not introduced until February 4, 2013—an inconvenient truth ignored by OET and several wireless commenters.

Moreover, the existing OET-69 methodology is perfectly capable of performing the functions needed for the incentive auction, and OET has failed to establish otherwise. The putative deficiencies in the existing methodology identified by some commenters are plainly inaccurate and mischaracterize the functions of a longstanding and well-established methodology that broadcast licensees have been using with success since the start of the transition of the U.S. television industry from analog to digital in the mid-1990s.

Preliminary testing of *TVStudy* also indicates that it produces inconsistent results and suffers from significant flaws. These defects are not fully understood because OET has not provided commenters with adequate time to test the new software and has failed to provide commenters with the Commission's own studies assessing *TVStudy*'s features.

It is a clear violation of the Spectrum Act and the Administrative Procedure Act to introduce a new OET-69 methodology when Congress has expressly prohibited the Commission from doing so.² Likewise, it is arbitrary and capricious to introduce defective software in the middle of a complex and uncertain incentive auction proceeding without adequate notice and comment and without publishing formal studies for commenters to use as benchmarks in their evaluation of the software. In addition to these failures, OET's introduction of *TVStudy* is imposing certain burdens and costs on broadcasters in an effort to achieve uncertain and gossamer benefits. OET and the Commission should refrain from using *TVStudy* in conjunction with the incentive auction.

² See 5 U.S.C. § 706(2)(A).

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The National Association of Broadcasters (“NAB”),³ Fox Entertainment Group, CBS Corporation, NBCUniversal, ABC Owned Television Stations, ABC Television Affiliates Association, CBS Television Network Affiliates Association, FBC Television Affiliates Association, and NBC Television Affiliates (collectively, “the Joint Broadcasters”) make this submission in response to comments filed pursuant to the Office of Engineering and Technology’s (“OET”) *Public Notice* 13-138⁴ announcing the introduction of *TVStudy* software and material changes to the methodology associated with OET Bulletin 69.⁵ As described in

³ NAB is a nonprofit trade association that advocates on behalf of local radio and television stations and broadcast networks before Congress, the Federal Communications Commission and other federal agencies, and the courts.

⁴ *Public Notice*, “Office of Engineering and Technology Releases and Seeks Comment on Updated OET-69 Software,” ET Docket No. 13-26 and GN Docket No. 12-268, DA 13-138 (Feb. 4, 2013) (“*Public Notice*”).

⁵ OET Bulletin No. 69, “Longley-Rice Methodology for Evaluating TV Coverage and Interference,” Feb. 6, 2004, at http://transition.fcc.gov/Bureaus/Engineering_Technology/Documents/bulletins/oet69/oet69.pdf. OET Bulletin 69 describes how to use the Longley-Rice methodology to evaluate television coverage and interference in accordance with Sections 73.622, 73.623 and 74.704 of the FCC rules.

NAB's submissions dated February 8, 2013 and March 21, 2013,⁶ the Joint Broadcasters object to OET's proposed use of *TVStudy* to calculate broadcast licensees' coverage and population served for purposes of the impending incentive auction because the proposed software directly contravenes Commission rules and Section 6403(b)(2) of the Spectrum Act. There is also no *practical* need for the new software. No evidence in the record suggests that it is more accurate than existing software, and, as Congress recognized, the existing OET-69 software is perfectly capable of performing the functions needed for the incentive auction. Moreover, even if these changes to the OET-69 methodology were permitted, the Commission must introduce them and allow the public adequate time for testing and comment, as required by the Administrative Procedure Act ("APA").⁷ The Joint Broadcasters address each of these points in greater detail below.

I. The Spectrum Act Unequivocally Mandates Use Of The OET-69 Methodology.

As noted in our opening comments, Section 6403(b)(2) of the Spectrum Act provides that for purposes of conducting the incentive auction:

the Commission shall make all reasonable efforts to preserve, as of the date of the enactment of this Act, the coverage area and population served of each broadcast television licensee, as determined using the methodology described in OET Bulletin 69 of the Office of Engineering and Technology of the Commission.⁸

Congress's use of the term "methodology" is understood to encompass not just the contents of OET Bulletin 69, but also the features of the OET-69 implementing software needed to generate predictive calculations. Indeed, the Bulletin itself states that "[a] computer is needed to make []

⁶ NAB Notice of Ex Parte Communication, ET Docket No. 13-26 and GN Docket No. 12-268 (Feb. 8, 2013) ("NAB Ex Parte Letter"); Comments of the National Association of Broadcasters *et al.*, "Office of Engineering and Technology Releases and Seeks Comment on Updated OET-69 Software," ET Docket No. 13-26 and GN Docket No. 12-268 (Mar. 21, 2013) ("NAB Comments").

⁷ 5 U.S.C. § 551 *et seq.*

⁸ Spectrum Act, § 6403(b)(2).

predictions because of the large number of reception points that must be individually examined.”⁹

This conclusion draws support from Congress’s command that the Commission “preserve, as of the date of the enactment of this Act,” both coverage area and population served.¹⁰ By requiring the Commission to preserve a particular outcome “as of” a particular date, Congress has mandated the use of the OET-69 implementing software that existed on that date. It is self-evident that anyone calculating population and area served on February 22, 2012 would have used the direction and learning then extant—and *not* such updates to the methodology that the Commission (or OET, for that matter) may from time to time adopt.¹¹

Accordingly, the “methodology” required by Section 6403(b)(2) is properly understood to include both the contents of OET Bulletin 69 and the features of the implementing software used to calculate coverage area and population served as of the effective date of the statute, February 22, 2012.¹² The Commission and OET therefore must use the existing OET-69 software to perform their responsibilities under the Spectrum Act.¹³

It is perplexing, then, that the Consumer Electronics Association (“CEA”) and CTIA – The Wireless Association (“CTIA”) insist that OET’s introduction of *TVStudy* is consistent with the Commission’s obligations under Section 6403(b)(2) of the Spectrum Act. They ground this contention in the phrase “all reasonable efforts,” but their reading is contrary to the provision’s meaning and context.

⁹ OET Bulletin No. 69, at 1.

¹⁰ Spectrum Act, § 6403(b)(2).

¹¹ NAB Ex Parte Letter 2-3.

¹² Arguments by CEA and CTIA to the contrary are unavailing and are an attempt to divorce the algorithms set forth in OET Bulletin No. 69 from the real world application of those algorithms for purposes of calculating coverage area and population served. Had Congress intended to allow the Commission to change the implementing software for OET-69, it would not have required that the Commission use “all reasonable efforts to preserve . . . coverage area and population served”—“as of” February 22, 2012—using the “methodology” of OET Bulletin 69.

¹³ NAB Comments 5-6 & nn. 14, 16-17.

Contrary to CEA’s and CTIA’s contentions, Congress did not merely *suggest* that the Commission use the OET-69 methodology; it directed that the Commission “*shall make all reasonable efforts to preserve . . . the coverage area and population served of each broadcast television licensee,*” as of February 22, 2012, using that methodology.¹⁴ The command “shall” reflects Congress’s decision to circumscribe the Commission’s discretion. Properly read, the phrase “all reasonable efforts” applies to the Commission’s duty to “preserve” stations’ “coverage area and population served”; that phrase does not somehow lessen the Commission’s unambiguous obligation to “determine[]” coverage area and population “using the methodology described in OET Bulletin 69.”¹⁵ The statutory language thus *constrains* the Commission; it does not, as CEA suggests, give the Commission discretion to abandon OET-69 in favor of an alternative methodology.¹⁶ If Congress had intended to allow the Commission to disregard or redefine the methodology for calculating coverage area and population served for purposes of the incentive auction, then there would have been no reason for Congress to explicitly incorporate the OET-69 methodology in this provision.

The Joint Broadcasters additionally note that the phrase “all reasonable efforts” permits the Commission less discretion than CEA and CTIA assume. Congress frequently uses the phrase “all reasonable efforts” to underscore legislative commands of special significance or concern.¹⁷ Here, the language is properly interpreted to obligate the Commission “to do everything feasible” to preserve stations’ coverage areas and populations served, as they were

¹⁴ Spectrum Act, § 6403(b)(2) (emphasis added).

¹⁵ *Id.*

¹⁶ CEA Comments 15-16.

¹⁷ “All reasonable efforts” is a term of art. *E.g.*, 10 U.S.C. § 2581(a)(1), (2); 18 U.S.C. §§ 4243(e), 4246(d), 4248(d); *see also Morissette v. United States*, 342 U.S. 246, 263 (1952) (“[W]here Congress borrows terms of art in which are accumulated the legal tradition and meaning of centuries of practice, it presumably knows and adopts the cluster of ideas that were attached to each borrowed word . . . and the meaning its use will convey to the judicial mind unless otherwise instructed.”).

calculated on February 22, 2012.¹⁸ It would be perverse to construe language that emphasizes the Commission’s duty to preserve population and coverage area as of February 22, 2012, as a license to disregard that duty.

Clearly, OET’s proposed alterations to OET-69 violate this statutory directive. As Communications Technologies, Inc. (“Communications Technologies”) candidly admits, *TVStudy* “will potentially change the population and area served for every television station record in CDBS when compared with the values determined with the current OET-69 software.”¹⁹ That outcome cannot be squared with the Spectrum Act’s text or congressional intent.

It is telling that no commenter disputes that the OET-69 “methodology” (that is, the contents of OET Bulletin 69 and its implementing software) was the only methodology accepted for calculations of coverage and population served at the time of the Spectrum Act’s enactment. Indeed, it is undisputed that the current OET-69 methodology was used for the development of new channel assignments during the digital television (“DTV”) transition, and has been used for the processing of applications for new or modified DTV operations for many years. Because the Spectrum Act is unambiguous in its command that the Commission employ the existing OET-69 methodology and “preserve” coverage and population served “as of” February 22, 2012, any contrary interpretation would not receive *Chevron* deference.²⁰

II. OET-69 Is Capable Of Predicting Coverage Area And Population Served For Purposes Of The Incentive Auction.

Several commenters contend that the Commission has authority to use *TVStudy* in lieu of the existing OET-69 methodology because the present OET-69 software cannot perform the

¹⁸ *Raicovich v. U.S. Postal Service*, 675 F.2d 417, 423-24 (D.C. Cir. 1982) (“all reasonable efforts” expressed Congress’s intent “to do everything feasible”).

¹⁹ Communications Technologies Comments 3.

²⁰ See *Chevron U.S.A. Inc. v. Natural Res. Def. Council, Inc.*, 467 U.S. 837 (1984).

functions required for the incentive auction.²¹ That is false, and neither OET nor other commenters have identified any auction-related function that the existing OET-69 software cannot execute.

First, CEA absurdly contends that *TVStudy* is necessary because the OET-69 software does not allow for analysis of global effects caused by potential modification of a single station.²² In fact, the existing OET-69 software is fully capable of performing this analysis—and has been used for this purpose for years. For example, OET-69 has been used in this manner in conjunction with the Commission’s development of new channel assignments during the DTV transition.²³

Second, CTIA insists that the existing OET-69 software is deficient because it ignores effects from terrain shielding.²⁴ That, too, is incorrect. The basic premise of the Longley-Rice propagation model is to *account* for terrain effects. As stated in OET Bulletin 69, “[t]he Longley-Rice radio propagation model is used to make predictions of radio field strength at specific geographic points *based on the elevation profile of terrain between the transmitter and each specific reception point*”—in other words, where terrain shielding occurs.²⁵

Third, CTIA makes the mystifying claim that the OET-69 methodology is outdated because it requires use of 1990 Census data.²⁶ In reality, 1990 Census data is not part of the existing OET-69 methodology. As noted in our initial March 21, 2013 comments, the use of

²¹ See CEA Comments 7-8; CTIA Comments 5-6.

²² CEA Comments 7.

²³ Declaration of Bruce Franca ¶¶ 7-8 (“Franca Decl.”), attached. OET-69 was also an integral tool in the Commission’s development of the original DTV Table of Allotments and in repacking stations from channels 52 to 69 into the core DTV spectrum. *Id.* ¶ 9.

²⁴ CTIA Comments 17.

²⁵ OET Bulletin 69, at 1 (emphasis added).

²⁶ CTIA Comments 18-19.

2000 Census data is required under Section 73.616(e)(1) of the Commission’s rules.²⁷ The full Commission adopted Section 73.616(e)(1) on December 22, 2007, well before Congress enacted the Spectrum Act.²⁸ That rule was therefore incorporated into the OET-69 methodology, and Congress is presumed to have intended the use of 2000 Census data as part of the OET-69 methodology.²⁹

Collectively, these misrepresentations about the functions of the existing OET-69 software reflect nothing more than a transparent attempt to profit from harm to broadcasters that is expressly forbidden by the Spectrum Act. CTIA’s and CEA’s preference for *TVStudy* is not based on any actual increase in the accuracy or efficacy of the OET-69 methodology. *TVStudy*, however, will harm broadcasters that do not participate in the auction by reducing predicted coverage and population served, thereby permitting the Commission to more tightly repack broadcast channels for the benefit of CTIA’s and CEA’s wireless members who would have access to a larger swath of spectrum.

III. There Is No Evidence That *TVStudy* Will Increase Accuracy.

Ignoring the statutory text, CEA and CTIA insist that the adoption of *TVStudy* is warranted because it supposedly improves the OET-69 software by “us[ing] better data and more

²⁷ NAB Comments 10-11; *see also* 47 C.F.R. § 73.616(e)(1) (providing in relevant part that “[f]or evaluating compliance with the requirements of this paragraph, interference to populations served is to be predicted based on the 2000 census population data and otherwise according to the procedure set forth in OET Bulletin No. 69: ‘Longley–Rice Methodology for Evaluating TV Coverage and Interference’ (February 6, 2004) (incorporated by reference, *see* § 73.8000), including population served within service areas determined in accordance with § 73.622(e), consideration of whether F(50,10) undesired signals will exceed the following desired-to-undesired (D/U) signal ratios, assumed use of a directional receiving antenna, and use of the terrain dependent Longley–Rice point-to-point propagation model”).

²⁸ *See* Third Periodic Review of the Commission’s Rules and Policies Affecting the Conversion to Digital Television, 23 FCC Rcd 2994, 3067 (2007) (changing census data used in OET-69).

²⁹ CTIA’s assertion that population has increased by 24 percent between 1990 and 2010 is therefore inapt; the population increase from 2000 to 2010 is only 9.7 percent.

accurate measurements, correct[ing] implementation errors, and permit[ing] the most appropriate treatment of ‘flagged’ . . . cells.”³⁰ These claims are unavailing for several reasons.

First, even assuming, *arguendo*, that *TVStudy* increases accuracy or the speed of calculations, it cannot be used in conjunction with the incentive auction because increasing the accuracy and speed of the OET-69 methodology is not part of the Spectrum Act’s statutory command.³¹ CTIA’s reliance on *EchoStar Satellite LLC v. FCC* actually undermines its argument.³² The statute at issue in *EchoStar*—the Satellite Home Viewer Improvement Act of 1999 (“SHVIA”)³³—contains provisions expressly authorizing the FCC to update its models over time. For example, SHVIA requires use of the “Individual Location Longley-Rice model . . . as that model may be amended by the Commission over time . . . to increase the accuracy of that model.”³⁴ SHVIA also directs the Commission to “establish procedures for the continued refinement in the application of the model by the use of additional data as it becomes available.”³⁵ Tellingly, the Spectrum Act contains no analogous provision authorizing the Commission to “refine” OET-69 or improve accuracy “over time” for purposes of the incentive auction. Rather, it commands the Commission to use “all reasonable efforts” to *preserve* calculations of coverage area and population served, as they existed on February 22, 2012, and using the OET-69 methodology.³⁶ Because OET’s proposed changes, whatever their wisdom,

³⁰ CEA Comments 3; CTIA Comments 5.

³¹ CTIA’s argument that *TVStudy* runs much faster than the OET-69 methodology and that the latter is too slow for repacking is fallacious. NAB used both *TVStudy* and the OET-69 methodology on a new computer and successfully completed a nationwide sample run using OET’s proposed changes and the existing OET-69 methodology in roughly the same amount of time. The runs using both methodologies were “faster” because they were performed on a faster, more modern computer; the speed was not due to *TVStudy*, as CTIA claims. *See* Franca Decl. ¶ 17; *see also* NAB Comments, Engineering Statement by Louis R. du Treil 1.

³² CTIA Comments 20 n.31 (citing *EchoStar Satellite LLC v. FCC*, 457 F.3d 31 (D.C. Cir. 2006)).

³³ Tit. I of the Intellectual Property and Communications Omnibus Reform Act of 1999, Pub. L. 106-113, 113 Stat 1501.

³⁴ 17 U.S.C. § 119(a)(2)(B)(ii)(I); *see also EchoStar*, 457 F.3d at 37.

³⁵ 47 U.S.C. § 339(c)(3)(A); *see also EchoStar*, 457 F.3d at 37.

³⁶ Spectrum Act, § 6403(b)(2).

are not the methodology that would have been used on February 22, 2012, they are forbidden for purposes of the incentive auction.

Second, there is simply no evidence that the use of *TVStudy* will lead to more accurate calculations. Although CEA and CTIA claim that calculations of coverage and population served are “more accurate” if actual signal levels predicted by OET-69 are used for “flagged” cells, the commenters offer no field measurements or empirical evidence to back up this claim.³⁷ The omission is telling, given that the Commission itself has reached the opposite conclusion: “An ‘Error Code 3’ message is given when the internal Longley-Rice program calculations show parameters are out of range and that reported results are *dubious* or *unusable*.”³⁸ There is simply no technical basis on which to conclude that the use of “dubious” or “unusable” signal level calculations will lead to “more accurate” predictions.³⁹

Third, CTIA’s own modeling confirms that the use of *TVStudy* will lead to *less* accurate calculations of coverage area. In Figures 1 and 5 of CTIA’s comments, for example, service is shown for stations WGBH and WRC using the existing Error Code 3 presumption of service.⁴⁰ In Figures 2 and 6 of the same comments, service for both stations was calculated using *TVStudy*’s treatment of “flagged” cells.⁴¹ Where the *TVStudy* methodology is used, both stations appear to lose service in several two-square kilometer blocks. For WGBH, several of these service disruptions are reflected in a portion of the Cape Cod area shown below:

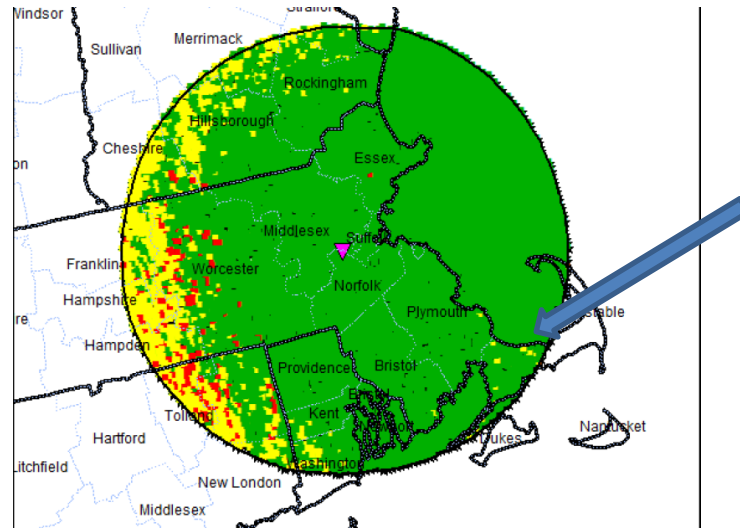
³⁷ Cf. CTIA Comments 9 (purporting to show only the “*effectiveness* of the Commission’s proposed implementation”) (emphasis added).

³⁸ Report and Order in MM Docket No. 00-39, FCC 01-24 (Jan. 18, 2001) at 26 n.120.

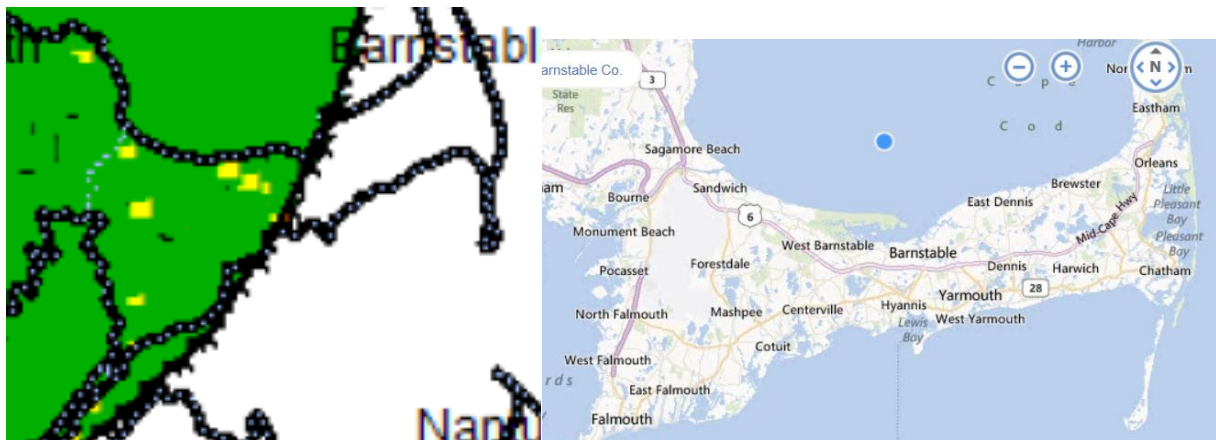
³⁹ *TVStudy*’s treatment of “flagged” cells—*i.e.*, either ignoring “flagged” error cells or assuming interference—is also inconsistent with the rules for use of so-called “TV White Spaces.” Specifically, the Commission has allowed unlicensed TV Band Devices (“TVBDs”) to operate on television frequencies if TVBDs protect existing television service. See 47 C.F.R. § 15.712(a)(1). Under this approach, TVBDs must assume broadcast service within the protected contour of a television station.

⁴⁰ CTIA Comments 11, Fig. 1 and 15, Fig. 5.

⁴¹ *Id.* at 12 and 16.



As demonstrated in this figure, *TVStudy* shows no coverage in several two-square kilometer blocks in the Cape Cod region of WGBH’s coverage area (see arrow). When the OET-69 methodology is used, with its assumption of service for Error Code 3, this same area shows coverage. According to CTIA, this difference is attributable to the fact that terrain shielding is accounted for by the *TVStudy* software and calculations. The following is an enlarged image of the areas in which terrain shielding allegedly results in a lack of TV reception, according to CTIA. A road map of the area is also shown.



The following table shows the terrain elevations for various towns in this part of Cape Cod:⁴²

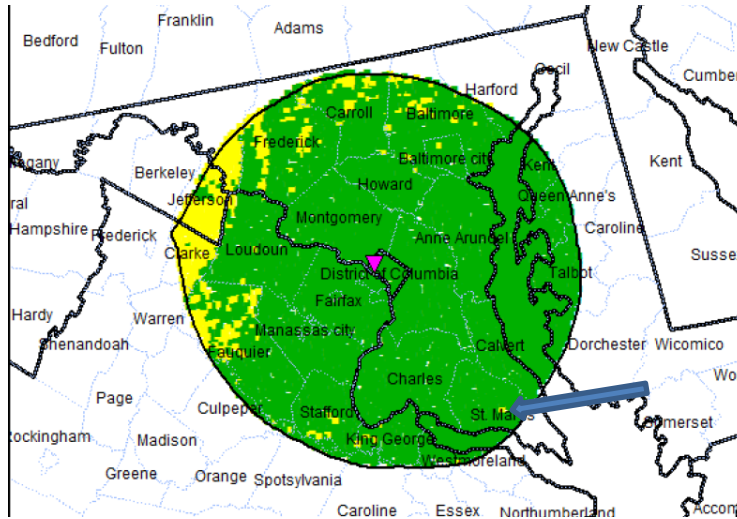
| Town | Coordinates | Elevation (feet) | |
|-----------------|---------------------|------------------|------------------|
| | | 1-Second Terrain | 3-Second Terrain |
| Bourne | 41 44 28N 70 35 58W | 25.4 | 17.7 |
| Sandwich | 41 45 32N 70 29 40W | 12.8 | 12.5 |
| East Sandwich | 41 44 16N 70 25 23W | 65.6 | 14.4 |
| Falmouth | 41 33 05N 70 36 55W | 6.7 | 9.8 |
| East Falmouth | 41 33 54N 70 33 00W | 21.0 | 9.8 |
| North Falmouth | 41 38 41N 70 37 50W | 7.8 | 4.6 |
| Monument Beach | 41 43 18N 70 36 30W | 23.9 | 25.6 |
| Mashpee | 41 38 54N 70 28 54W | 70.5 | 75.1 |
| Barnstable | 41 42 00N 70 18 00W | 29.2 | 26.3 |
| West Barnstable | 41 42 20N 70 22 28W | 40.5 | 48.2 |
| Yarmouth | 41 42 00N 70 14 00W | 79.4 | 50.2 |

These elevations clearly indicate that there is no terrain in the region likely to cause terrain shielding and service disruptions over tens of square kilometers.⁴³ A more likely explanation is that the use of out-of-range calculations produced *dubious* or *unusable* results.

A similar phenomenon is observed for WRC's coverage in St. Mary's County, Maryland (see arrow below).

⁴² Franca Decl. ¶ 14.

⁴³ Franca Decl. ¶ 16.



An enlarged image of the relevant portion of St. Mary’s County is shown below:



CTIA attributes the absence of service in this area to the “more accurate[.]” predictions of “terrain shielding” in *TVStudy*,⁴⁴ but that claim is clearly incorrect. The average elevation in St. Mary’s County is 68 feet above mean sea level, and the maximum elevation in the entire county is 192 feet above mean sea level.⁴⁵ In other words, St. Mary’s County does not contain terrain that would result in the “terrain shielding” effects suggested by CTIA.⁴⁶ The fact that *TVStudy* erroneously predicts that television reception would be eliminated over 12-square kilometers refutes CTIA’s suggestion that *TVStudy* provides a more accurate real-world prediction of

⁴⁴ CTIA Comments 8, 16.

⁴⁵ See Maryland Geological Survey, Highest and Lowest Elevations in Maryland’s Counties, at <http://www.mgs.md.gov/esic/fs/fs1.html>; Franca Decl. ¶¶ 14, 15.

⁴⁶ Franca Decl. ¶ 16.

coverage. In summary, the use of *TVStudy* would produce specific and concrete reductions in coverage area and population served for television broadcasters.

Fourth, the Commission already decided in 2001 that the presumption of service in the case of Error Code 3 is “appropriate . . . because it is similar to the situation, where for many purposes, all locations within an NTSC TV station’s Grade B contour are assumed to receive service.”⁴⁷ It was on this basis that the Commission deemed it appropriate to assume service within the noise-limited contour of a DTV station in the event of Error Code 3. To abandon this longstanding presumption on the ground that the Error Code 3 values are “typically not unreasonable,” despite the Commission’s own acknowledgment that such results are “dubious” and “unusable” and without any evidence or measurement data to the contrary, is technically meritless and an unreasoned reversal of Commission practice.⁴⁸

Commenters have also suggested that using one-arcsecond terrain data will lead to more accurate predictions.⁴⁹ Here again, however, there is no empirical evidence that using finer terrain resolution would increase the accuracy of OET-69’s propagation predictions. In fact, testing has shown just the opposite. For example, tests conducted by others have concluded that using finer terrain resolution actually renders the results *less* accurate.⁵⁰ Specifically, using one-

⁴⁷ Report and Order in MM Docket No. 00-39, FCC 01-24 (Jan. 18, 2001) at 27 n.121.

⁴⁸ CEA Comments 7 (quoting Public Notice 5).

⁴⁹ CEA Comments 4-5; CTIA Comments 7-8.

⁵⁰ See, e.g., Sid Shumate, “Longley-Rice’s Faulty Subroutines, Part 1: Z1SQ1,” IEEE Broadcast Technology Society Newsletter 16 (Spring 2009). Shumate reported:

Tests on the ITM show that correct operation of the *z1sq1* subroutine is critical to the correct determination of the terrain roughness delta-h coordinate. Tests with a version of the ITM modified to allow the delta-h value to be printed on the output reports showed the delta-h value often starting at reasonable values (5 to 100 meters) for the first few kilometers, but increasing to over 5,000 meters on some 50-kilometer paths using a three-arc second database; the overweighting of the middle values increases the errors as the numbers of intervals increase. For a given path, the number of intervals increases as the resolution of the terrain database increases, from 30 arc-sec to 3 arc-sec and better. *So the higher the resolution of the terrain database, the worse the results.*

Id. at 17 (emphasis added).

arcsecond data leads to worse results because the increase in the number and interval of terrain data points distorts the terrain roughness calculations on which the predictive models were originally based, and introduces new errors that cannot be accounted for by the current predictive software. To test these effects using *TVStudy* will require extensive analysis and confirming measurements, none of which has been proposed by the Commission or submitted by any of the commenters in this proceeding.

Ultimately, it is far from clear that *TVStudy* offers *any* improvements to OET-69 methodology. In its incentive auction rulemaking notice, the Commission itself has acknowledged the practical limits of computer optimization software such as *TVStudy*.⁵¹ Nevertheless, OET is aggressively pursuing changes to the OET-69 methodology that impose enormous costs and burdens on broadcast licensees with no discernible benefit. Even if such changes were allowed under the Spectrum Act, OET's failure to account for the costs to broadcasters (and ultimately to viewers) is arbitrary and capricious.⁵² But such changes are not allowed. Thus, even if *TVStudy* offered some marginal benefit over the existing OET-69 methodology (a point that has not been established and that the Joint Broadcasters do not concede), Congress has clearly signaled that the predictability and stability of the existing methodology are the paramount concern.

IV. *TVStudy* Does Not Produce Consistent Results.

CEA and CTIA also defend the use of *TVStudy* as being more consistent than the existing OET-69 software, but NAB's review of *TVStudy* belies that claim.⁵³ Indeed, NAB's testing has shown that *TVStudy* produces widely inconsistent results. For example, NAB's implementation

⁵¹ Notice of Proposed Rulemaking in Docket No. 12-268, ¶ 45 (rel. Oct. 2, 2012) ("NPRM").

⁵² See, e.g., *Chamber of Commerce v. SEC*, 412 F.3d 133, 143-44 (D.C. Cir. 2005) (failure to assess costs was arbitrary and capricious); *People of State of Cal. v. FCC*, 39 F.3d 919, 930 (9th Cir. 1994) (finding that FCC's cost benefit analysis was flawed and setting aside FCC Order as arbitrary and capricious under the APA).

⁵³ See CEA Comments 5; CTIA Comments 2, 4, 7-9, 18, 19.

and results are significantly different than those submitted by CTIA. The following table shows the different calculations for the three stations used in the CTIA examples:

| Station | CTIA TVStudy Results | | | | NAB TVStudy Results | | | |
|---------|-----------------------------|------------|-----------------------------|------------|-----------------------------|------------|-----------------------------|------------|
| | Service | | Disregard Error Code 3 | | Service | | Disregard Error Code 3 | |
| | Coverage (km ²) | Population | Coverage (km ²) | Population | Coverage (km ²) | Population | Coverage (km ²) | Population |
| WGBH | 32,345 | 7,586,562 | 30,432 | 7,468,613 | 32,698 | 7,612,584 | 30,327 | 7,458,888 |
| WGN | 32,990 | 9,941,062 | 32,901 | 9,936,071 | 31,125 | 9,815,699 | 30,748 | 9,786,021 |
| WRC | 22,310 | 7,958,294 | 21,266 | 7,881,886 | 22,223 | 7,947,688 | 21,088 | 7,867,013 |

NAB’s experience has also been corroborated by Sinclair Broadcast Group, Inc. (“Sinclair”), which notes that several prominent television broadcasters have expressed concerns about inconsistent and even “drastically different” results between different companies and within the same company.⁵⁴

The Commission’s failure to release its own studies and provide a baseline or computational examples against which to assess or validate the software is a hallmark of arbitrary and capricious agency action.⁵⁵ It is also inconsistent with the Commission’s past practice.⁵⁶ When the Commission introduced the existing OET-69 procedures, it published extensive software results and studies for notice and comment.⁵⁷ Here, OET and the Commission have been remarkably reticent about their own experience with *TVStudy*, instead opting to punt

⁵⁴ Sinclair Comments 3-4.

⁵⁵ *Am. Radio Relay League v. FCC*, 524 F.3d 227, 231 (D.C. Cir. 2008) (“The Commission failed to satisfy the notice and comment requirements of the Administrative Procedure Act [] by redacting studies on which it relied in promulgating the rule and failed to provide a reasoned explanation for its choice of the extrapolation factor for measuring Access BPL emissions.”); *Owner-Operator Indep. Drivers Ass’n v. FMCSA*, 494 F.3d 188, 199 (D.C. Cir. 2007) (holding that agency violated the APA by failing to disclose studies and data that it employed in reaching its decision about the rule at issue); *Solite Corp. v. EPA*, 952 F.2d 473, 484 (D.C. Cir. 1991) (“Integral” to APA requirements “is the agency’s duty ‘to identify and make available technical studies and data that it has employed in reaching the decisions to propose particular rules. . . . An agency commits serious procedural error when it fails to reveal portions of the technical basis for a proposed rule in time to allow for meaningful commentary.”) (quoting *Conn. Light & Power Co. v. NRC*, 673 F.2d 525, 530-31 (D.C. Cir. 1982)).

⁵⁶ *See FCC v. Fox Television Stations, Inc.*, 129 S. Ct. 1800, 1811 (2009) (observing that an agency cannot “depart from a prior policy sub silentio or simply disregard rules that are still on the books”).

⁵⁷ Franca Decl. ¶ 12.

to commenters to do the heavy lifting. OET’s failure to release comprehensive studies of its own makes it impossible for commenters to know if any particular set of results is consistent with OET’s own implementation.⁵⁸

OET’s posting of a “sample file” on the Commission website four days *after* the comments on the revised OET-69 methodology were due precluded meaningful notice and comment in violation of the APA.⁵⁹ Indeed, the Commission’s “notice” of this posting consisted of an email sent to subscribers to a non-FCC distribution list—a clear violation of the APA’s notice requirements.⁶⁰ What is more, the results of OET’s “sample file” differ from both the CTIA and NAB results provided in the above Table.

Like Sinclair, NAB is aware of numerous parties that have encountered variations in their implementation of *TVStudy*. Accordingly, there does not appear to be any validity to CEA’s and CTIA’s claim that *TVStudy* leads to more consistent calculations.

CONCLUSION

OET released the *TVStudy* software, with no advance notice, for an operating system that is not widely used in broadcast engineering. It did so in violation of Commission rules and the Spectrum Act’s express mandate that the Commission use the existing OET-69 methodology to determine stations’ coverage areas and populations served. Preliminary testing of the *TVStudy*

⁵⁸ Sinclair Comments 4.

⁵⁹ See Franca Decl. ¶ 13 & Ex. A; see also, e.g., *N.C. Growers’ Ass’n, Inc. v. United Farm Workers*, 702 F.3d 755, 770 (4th Cir. 2012) (finding Labor Department regulatory action arbitrary and capricious because ten-day notice period “did not provide a meaningful opportunity for comment” and the Department “did not solicit or receive relevant comments”); *Lloyd Noland Hosp. & Clinic v. Heckler*, 762 F.2d 1561, 1565 (11th Cir. 1985) (failure to disclose study in original public notice was “inadequate” under the APA because “[t]he purpose of notice under the APA is to disclose the thinking of the agency and the data relied on” and an “agency cannot promulgate rules based on data known only to the agency”).

⁶⁰ See *Lloyd Noland Hosp.*, 762 F.2d at 1565; see also *Nat’l Black Media Coalition v. FCC*, 791 F.2d 1016, 1018, 1023 (2d Cir. 1986) (finding that “the methodology used [by the FCC] in creating the maps and studies [at issue], and the meaning to be inferred from them . . . should have been part of the public record” and holding that reliance on “inadequately disclosed data” and failure to expose studies and maps relied on by the FCC to public comment constituted arbitrary and capricious agency action in violation of the APA (internal quotation marks omitted)); 5 U.S.C. § 553; Franca Decl. ¶ 13 & Ex. A.

software indicates that it is neither more accurate, nor more consistent, than the existing OET-69 software and that the existing OET-69 methodology is perfectly capable of performing the calculations needed for the incentive auction. For these reasons, the Joint Broadcasters respectfully request that OET and the Commission suspend implementation of the *TVStudy* software until after the incentive auction of broadcast spectrum.

Respectfully submitted,



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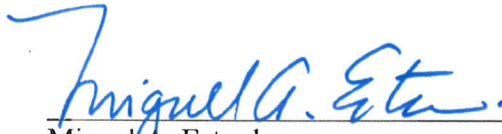
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DECLARATION OF BRUCE FRANCA

I, Bruce Franca, hereby declare under penalty of perjury that:

1. I am Vice President of Technology at the National Association of Broadcasters (“NAB”).
2. I graduated from Pratt Institute in Brooklyn, New York, and did graduate work in electrical engineering at the George Washington University in Washington, D.C.
3. Prior to joining NAB in 2011, I was Vice President for Policy and Technology at the Association for Maximum Service Television (“MSTV”).
4. Before joining MSTV, I worked at the Federal Communications Commission (“FCC”). I joined the FCC in 1974 as an engineer in the Aviation and Marine Division of the Safety and Special Radio Services Bureau (now the Wireless Telecommunications Bureau). I have held positions in the Office of Plans and Policy and the Mass Media Bureau.
5. I joined the Office of Engineering and Technology (“OET”) as Deputy Chief in 1987 and became Chief of OET in 2005.
6. During my tenure at OET, I led the FCC’s technical efforts with regard to digital television (“DTV”) and the development of the DTV Table of Allotments, for which I was awarded the Chairman’s Special Achievement Award in 1996. I was elected a charter member of the Academy of Digital Television Pioneers. I was also involved in a number of significant technical matters including the development of the Direct Broadcast Satellite (“DBS”) and Personal Communications Services (“PCS”). In 2005, I was awarded the Gold Medal for Meritorious Service. In 2009, I received the E. Noel Luddy award for meritorious service from the Association of Federal Communications Consulting Engineers (“AFCCE”).

7. The OET-69 methodology has been used for the calculation of coverage and population served in conjunction with the development of new channel assignments during the DTV transition.

8. The OET-69 methodology has also been used for the processing of applications for new or modified DTV operations for many years.

9. OET-69 was an integral tool in the Commission's development of the original DTV Table of Allotments, as well as in repacking stations from channels 52 to 69 into the core DTV spectrum.

10. The Commission's decision to presume service in the case of Error Code 3 "was based on the bedrock principle that all locations within an NTSC TV station's Grade B contour are assumed to receive service." On this basis, the Commission found it to be appropriate to assume service within the noise-limited contour of a DTV station. OET-69 was the only methodology accepted for calculations of coverage area and population served at the time of the passage of the Spectrum Act.

11. The original Longley-Rice predictive model is based on many tens of thousands of measurements and observations of radio signal propagation over varying terrain. Based on these measurements, theoretical and empirical models were developed and implemented in software to predict signal attenuation over selected paths where terrain could be taken into account. These models were derived and calibrated based on terrain data with a resolution of 30-arcseconds and 3 arcseconds.*

* For a detailed technical description of how the Longley-Rice model computes the effective path loss using terrain and the actual derivation of the terrain roughness factor (Δh), refer to NTIA Report 82-100, A Guide to the Use of the ITS Irregular Terrain Model in the Area Prediction Mode, G.A. Hufford, A.G. Longley and W.A. Kissick, U.S. Department of Commerce, April 1982 and articles published in the Winter 2008 and Spring 2009 IEEE Broadcast Technology Society Newsletters by Sid Shumate of Givens & Bell.

12. When the Commission introduced the existing OET-69 procedures, it published extensive software results and studies for notice and comment.

13. At the time of the *TVStudy* release, the FCC had not provided baseline or computational examples on which to judge or validate the software. Such a baseline was not released until March 25, 2013, when a single “sample file” was placed on the FCC website and notification was made to individuals subscribed to a non-FCC e-mail list. A true and correct copy of the FCC’s notification is attached hereto as Exhibit A.

14. I evaluated the data presented by CTIA – The Wireless Association (“CTIA”) in its March 21, 2013 comment to OET and compared it to publicly available terrain information for the Cape Cod area of Massachusetts and for St. Mary’s County in Maryland. Terrain information was obtained from the Maryland Geological Survey and the U.S. Geologic Survey’s 1- and 3-arcsecond databases in *TVStudy* for Cape Cod.

15. The terrain elevations for towns in the relevant region of Cape Cod vary from about 10 to 80 feet above mean sea level (“AMSL”). The average elevation in St. Mary’s County is 68 feet AMSL, and the maximum elevation in the entire county is 192 feet ASML.

16. Based on my expert knowledge, this kind of terrain would not result in the “terrain shielding” effects for the areas of Cape Cod or St. Mary’s County suggested by CTIA.

17. Finally, NAB conducted nationwide sample runs using *TVStudy* and the existing OET-69 methodology, and both runs took roughly the same amount of time. The speed of these runs did not appear to be caused by the changes that OET incorporated into the *TVStudy* software, but rather the use of a modern computer running an updated operating system.

Executed: April 5, 2013


Bruce Franca

Exhibit A

From: Robert Weller [<mailto:Robert.Weller@fcc.gov>]
Sent: Monday, March 25, 2013 4:13 PM
To: 'afcce-cdbs@cavellmertz.com'
Subject: [AFCCE-CDBS] Reference output files available for TVStudy

(You are receiving this message because you've expressed interest in the Commission's TVStudy software, which implements the methodology described in OET Bulletin 69. I want to suggest that you subscribe to a non-FCC e-mail list-serve that may provide helpful information about TVStudy, including alerts when the readme files and other documentation are updated. Simply send an e-mail to Mike.Rhodes@CavellMertz.com asking that your name/email be added to the AFCCE-CDBS list.)

TVStudy users:

A couple of comments were received in ET Docket 13-26 that requested sample output files from TVStudy to allow users to verify that they are getting the same results as OET does. We have been providing sample output upon request, but have placed a complete set of output files (Sample_tvstudy_results.zip) at:

<http://data.fcc.gov/download/incentive-auctions/OET-69/>

The zip file is about 464 MB in size. When unzipped, a directory of about 2.1 GB will be created containing 19 files.

The 19 output files reflect an example study of all 2,228 licensed full-power and Class A stations in the U.S. that are listed in the February 22, 2012, CDBS. The study took less than 17 minutes to complete on our iMac.

The facilities chosen for study are simply those listed as licensed in the supplied CDBS extract. Users should not assume that those facilities are the ones to be considered for any particular purpose, such as the Incentive Auction. The parameters selected for the study are listed in the header of the .txt file, but users should similarly not assume that those parameters have any particular significance.

OET continues to welcome input on calculation parameters and other matters during the reply comment period, which closes April 5.

As always, if you have questions please feel free to contact me or ask the group.

Bob W.