Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Establishment of a Model for Predicting Digital Broadcast Television Field Strength Received at Individual Locations	)	ET Docket No. 10-152
	)	
Measurement Standards for Digital Television Signals Pursuant to the Satellite Home Viewer Extension and Reauthorization Act of 2004	)	ET Docket No. 06-94

NOTICE OF PROPOSED RULEMAKING AND FURTHER NOTICE OF PROPOSED RULEMAKING

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By the Commission:

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I. INTRODUCTION

1. The Satellite Television Extension and Localism Act of 2010 (STELA)[1] reauthorizes the Satellite Home Viewer Extension and Reauthorization Act of 2004 (SHVERA)[2] by extending the effectiveness and amending certain provisions in the Communications Act and the Copyright Act. These provisions govern the delivery of distant network-affiliated broadcast television station signals by satellite providers. To implement the new statutory regime, the STELA requires the Commission, within 270 days after the date of its February 27, 2010 enactment,[3] to 1) "develop and prescribe by rule a point-to-point predictive model for reliably and presumptively determining the ability of individual locations, through the use of an antenna, to receive signals in accordance with the signal intensity standard in Section 73.622(e)(1) of [our rules], or a successor regulation, including to account for the continuing operation of translator stations and low power television stations," and 2) issue an order completing our rulemaking to establish a procedure for on-site measurement of digital television signals in ET Docket No. 06-94.

2. In the Notice of Proposed Rulemaking (NPRM) portion of this action, we are proposing to prescribe a point-to-point predictive model for determining the ability of individual locations to receive an over-the-air digital television broadcast signal at the intensity level needed for service through the use of an antenna, as required by the STELA. Our goal in proposing this model is to provide a means for reliably and presumptively determining whether the over-the-air signals of television stations, including low power stations, can be received at individual locations for purposes of establishing the eligibility of individual households to receive the signals of distant television broadcast network stations from their satellite carriers. We believe that the proposed predictive model, which is based on the current model for predicting the intensity of analog television signals at individual locations, will allow such determinations to be made in a timely and cost effective manner for all parties involved, including network TV stations, satellite carriers and satellite subscribers.

3. In the Further Notice of Proposed Rulemaking (FNPRM), we seek information to update the record in ET Docket No. 06-94, based on which we intend to prescribe rules for determining eligibility of satellite subscribers for receiving distant network signals from their satellite TV provider using on-location testing/measurements. The Commission previously sought comment on a variety of issues related to establishment of a procedure for on-location measurements pursuant to the SHVERA, but has not yet adopted final rules specifying such a procedure.[4] In the STELA, Congress modified some of the testing requirements set forth in the SHVERA. We are addressing these modifications to both refresh the record and obtain additional information and comment on STELA requirements that differ from the SHVERA requirements.

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[1] *See* Satellite Television Extension and Localism Act of 2010, Title V of the "American Workers, State, and Business Relief Act of 2010," Pub. L. 111-175, 124 Stat. 1218 (2010).

[2] *See* Satellite Home Viewer Extension and Reauthorization Act of 2004, Title IX of the "Consolidated Appropriations Act, 2005," Pub. L. No. 108-447, § 204, 118 Stat 2809, 3393, 3423-24 (2004), codified at 47 U.S.C. §339(c)(1).

[3] 47 U.S.C. § 339(c)(3)(A) and (B), as amended by STELA Section 204. Section 307 of STELA specifies that the "date of enactment" is February 27, 2010. Thus, the deadline for completing this rulemaking is statutorily established as November 24, 2010.

[4] *See* Measurement Standards for Digital Television Signals Pursuant to the Satellite Home Viewer Extension and Reauthorization Act of 2004, ET Docket No. 06-94, *Notice of Proposed Rulemaking*, 21 FCC Rcd 4735 (2006) (*SHVERA NPRM*).

II. BACKGROUND

4. Congress originally established statutory provisions relating to delivery of distant network-affiliated broadcast television stations by satellite providers in the 1988 Satellite Home Viewer Act (SHVA), and subsequently revised and extended those provisions in the Satellite Home Viewer Improvement Act of 1999 (SHVIA) and the Satellite Home Viewer Extension and Reauthorization Act of 2004 (SHVERA).[5] Under the SHVA and its successors, households at locations that are unable to receive a local network-affiliated broadcast television station's signal with an antenna at sufficient strength for reception, *i.e.*, where the signal strength is below the threshold for reception, are defined as "unserved households" and, therefore, are eligible to receive a distant signal of the same network affiliation through their satellite service provider.[6] Conversely, households at locations that are able to receive a local network-affiliated station's signal with an antenna at sufficient strength, *i.e.*, above the threshold for reception, are not eligible to receive a distant station affiliated with the same network unless granted a waiver by the affiliates whose signals they are able to receive.[7] Determinations of whether a signal can be received are based on whether the signal level present at the location is above or below a standard value of field strength needed for service. For analog TV signals, that standard is the Grade B contour levels set forth in Section 73.683(a) of the Commission's rules, and for digital TV signals the standard as established by the STELA is the noise-limited contour set forth in Section 73.622(e)(1) of the Commission's rules.[8]

5. In the 1999 SHVIA, Congress, *inter alia*, directed the Commission to amend its rules to prescribe a predictive model for determining whether a household can receive the analog television signal broadcast by a local television station. More specifically, the SHVIA added a new section 339(c)(3) to the Communications Act which required that the Commission develop and prescribe by rule a point-to-point predictive model for reliably and presumptively determining the ability of individual locations to receive analog TV signals in accordance with the signal intensity standard in effect under section 119(d)(10)(A) of Title 17, United States Code, *i.e.* the Grade B field strength contours for television stations in Section 73.683(a) of the Commission's rules.[9] Section 339(c)(3) further provided that "in prescribing such a model, the Commission shall rely on the Individual Location Longley-Rice [ILLR] model set forth by the Federal Communications Commission in Docket No. 98-201, and ensure that such

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[5] *See* Satellite Home Viewer Extension and Reauthorization Act of 2004 (SHVERA), Title IX of the "Consolidated Appropriations Act, 2005," Pub. L. No. 108-447, § 204, 118 Stat 2809, 3393 3423-24, (2004), codified at 47 U.S.C. §339(c)(1); Satellite Home Viewer Improvement Act of 1999 (SHVIA), Title I of the Intellectual Property and Communications Omnibus Reform Act of 1999, PL 106-113, § 1000(9), 113 Stat. 1501, Appendix I (1999); 1988 Satellite Home Viewer Act, 17 U.S.C. §119 (1988). Congress enacted the SHVA and its successors to protect television broadcasters' copyright interests while simultaneously enabling satellite carriers to provide the signals of broadcast network stations to those satellite subscribers who are unable to obtain local network stations over-the-air..

[6] SHVA and its successors modify both the copyright statute in Title 17 of the United States Code and the Communications Act in Title 47 of the United States Code. Section 119 of Title 17 provides a statutory copyright license pursuant to which satellite carriers may retransmit the "distant" signals of television broadcast stations that are located outside the market in which the satellite subscriber is located under specific circumstances, including when the subscribers are in "unserved households." 17 U.S.C. § 119(d)(10)(A).

[7] 47 U.S.C. § 339(b)(2).

[8] *See* 47 U.S.C § 339(a)(2)(D)(i), as amended by STELA Section 204; 47 C.F.R. §§ 73.622(e)(1), 73.683(a) and 73.683(d). A broadcast station's Grade B and noise-limited contours are the areas within which the station's signal strength is predicted to exceed a level specified by the Commission's rules.

[9] *See* SHVIA, section 1008(a); *see also* 47 C.F.R. § 73.683(a).

model takes into account terrain, building structures, and other land cover variations. The Commission shall establish procedures for the continued refinement in the application of the model by the use of additional data as it becomes available."[10] The ILLR model is a computer program specifically designed to predict the strength of an over-the-air signal at an individual location, such as a consumer's home, by considering what happens to the signal as it travels between the transmitter and the home (the propagation path).[11] This model accounts for the effects that terrain and other morphological features have on signal strength. The SHVIA did not, however, contain provisions for prediction of the signal levels of digital television signals.

6. In compliance with the statutory directive in the SHVIA, the Commission adopted a point-to-point predictive model (SHVIA ILLR model) for determining the ability of individual locations to receive an over-the-air analog television broadcast signal of a specific intensity through the use of a conventional, outdoor rooftop receiving antenna in ET Docket No. 00-11.[12] The SHVIA ILLR model was an improved version of the original ILLR model endorsed by the Commission for use under the SHVA that incorporated features to account for land use and land cover (LULC) as well as terrain. The Commission also provided for the SHVIA ILLR model's continued refinement by the use of additional data as might become available.[13] More specifically, it provided that refinements based on such additional data may be proposed by referencing the docket of that proceeding, which it held open for that purpose. The SHVIA ILLR model is currently used for making predictions of analog TV field strengths

[10] 47 U.S.C. § 339(c)(3). *See Report and* Order in CS Docket No. 98-201, 14 FCC Rcd 2654 (1999) (*SHVA Report and Order*).

[11] The ILLR 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. A computer is needed to make these predictions because of the large number of reception points that must be individually examined. Computer code for the ILLR point-to-point radio propagation model is published in an appendix of NTIA Report 82-100, *A Guide to the Use of the ITS Irregular Terrain Model in the Area Prediction Mode*, authors G.A. Hufford, A.G. Longley and W.A. Kissick, U.S. Department of Commerce, April 1982. Some modifications to the code were described by G.A. Hufford in a memorandum to users of the model dated January 30, 1985. With these modifications, the code is referred to as Version 1.2.2 of the Longley-Rice radio propagation model. It is available at the U.S. Department of Commerce Web site, http://elbert.its.bldrdoc.gov/itm.html.

[12] *See First Report and Order* in ET Docket No. 00-11, 15 FCC Rcd 12118 (2000) (*SHVIA First Report and Order*). The SHVIA ILLR model is described detail in the Commission's OET Bulletin No. 72, which is available at http://www.fcc.gov/oet/info/documents/bulletins/#72. The rules prescribing use of the ILLR model for determining whether a household is served by a local station are set forth in Section 73.683(d) of the Commission's rules. 47 C.F.R. § 73.683(d). In the *SHVIA First Report and Order* action, the Commission also adopted standards for collection of field strength data to determine the intensity of analog television signals at an individual location. Those standards are set forth in Section 73.683(e). 47 C.F.R. § 73.683(e). *See also* 17 U.S.C. § 119(d)(10(A), as amended by SHVIA, which specifically defined "unserved household" by reference to signal reception with "a conventional, stationary, outdoor rooftop antenna."

[13] Based on the record in the SHVA proceeding, the Commission found that vegetation and buildings affect signal intensity at individual locations. However, it also found that at the time of the *SHVA Report and Order*, there was no standard means of including such information in the SHVIA ILLR model that had been accepted by the technical and scientific community. The Commission therefore stated that land use and cover information would be included in the ILLR when an appropriate method for using such information in the context of determining the field strength of broadcast television signals at individual locations has been developed and accepted. *See SHVA Report and Order* at 2692-2693. The Commission reiterated this conclusion in the *Order on Reconsideration* in the SHVA proceeding. *See Order on Reconsideration* in CS Docket No. 98-201, 14 FCC Rcd 17373 (1999), at 17378. In that action, the Commission denied DirecTV's petition for reconsideration, in part, on the basis that it failed to provide the information and details necessary to evaluate an application to consider land use and cover in the ILLR.

at individual locations.

7. In the 2004 SHVERA, Congress again amended the Copyright Act[14] and the Communications Act to further aid the competitiveness of satellite carriers and to expand program offerings for satellite subscribers.[15] The SHVERA included new provisions for distant digital signal reception and amended section 339 of the Communications Act and section 119 of the Copyright Act to provide three methods by which a subscriber can establish eligibility to receive such signals.[16] First, a subscriber was eligible to receive the distant digital signal of a particular network if his or her household was predicted to be unserved by the over-the-air analog signal of any affiliate of that network (not necessarily the local affiliate), or was determined by on-site testing to be unserved by the over-the-air analog signal of any affiliate of that network. The SHVIA ILLR model was used to make predictions under this provision. Second, a subscriber whose household was predicted to be served by a local station's analog signal could request an on-site signal strength test to determine if his or her household is unable to receive that station's digital signal.[17] Third, a satellite subscriber could receive distant digital signals if the television network station granted a waiver to allow satellite retransmission of the relevant network from a distant station. There was no provision in SHVERA for a predictive model for determining if a specific household can receive a digital TV signal of adequate strength. Rather, presumptive determinations of eligibility to receive a distant network digital signal were based on predictions of whether the household was unserved by the local network affiliate's associated analog signal.[18]

8. The SHVERA also required that the Commission conduct an inquiry and develop recommendations regarding whether the Commission's digital signal strength standard and the signal testing procedures for determining if a household is "unserved" should be revised.[19] The Commission's findings from this inquiry and its recommendations were set forth in a 2005 *Report to Congress*.[20] Therein, the Commission recommended that the SHVIA ILLR model (the version improved through the addition of land use and land clutter information) be used for predicting whether a household is unserved by digital television signals.[21] The Commission further recommended that Congress authorize adoption of the SHVIA ILLR analog model for use in determining whether households are unserved by local digital signals under the SHVERA. In addition, the Commission stated generally that the digital

[14] Section 103 of the SHVERA created a new 17 U.S.C. § 119(a)(4)(D) to provide satellite carriers with a statutory copyright license to offer distant digital network signals.

[15] *See* 47 U.S.C. §§ 325, 338, 339 and 340.

[16] *See* 17 U.S.C. § 119(d)(10)(A) and 47 U.S.C. § 339(c)(4)(A); *see also* 47 U.S.C. § 339 (a)(2)(D)(i).

[17] Generally, subscribers in the top 100 television markets were allowed to request a digital signal strength test after April 30, 2006 and subscribers in other markets were allowed to request a test after July 15, 2007. *See* 47 U.S.C. §339(a)(2)(D)(vii)(I)(aa)(bb). The Commission proposed rules for a digital signal strength measurement procedure and that procedure has been used on an interim basis pending its adoption of final rules. *See In the Matter of Measurement Standards for Digital Television Signals Pursuant to the Satellite Home Viewer Extension and Reauthorization Act of 2004*, ET Docket No. 06-94, *Notice of Proposed Rulemaking,* 21 FCC Rcd. 4735 (2006).

[18] 17 U.S.C. 119(a)(4)(D); see also 47 U.S.C. 339(a)(2)(D) and 17 U.S.C. 119(d)(10)(A).

[19] *See* SHVERA, section 204(b); section 204(b) was codified in 47 U.S.C. 339(c).

[20] *See Report to Congress: Study Of Digital Television Field Strength Standards And Testing Procedures* in ET Docket No. 05-182, 20 FCC Rcd 19504 (2005) (*2005 Report to Congress*).

[21] *2005 Report to Congress*, 20 FCC Rcd 19562-19570.

television measurement procedures should be similar to the existing procedures for measuring the field strength of analog television stations in Section 73.686(d) of the rules, but with certain modifications to address the differences between analog and digital TV signals.[22]

9. Subsequent to the SHVERA and the *2005 Report to Congress*, the Commission adopted the *SHVERA NPRM* in which it proposed to amend its rules to provide procedures for measuring the field strength of digital television signals. These proposed new measurement procedures accounted for the differences that are inherent between analog and digital television signals. The proposed procedures would be generally applicable for measuring digital TV signal strengths and specifically applicable for determining a household's eligibility to receive a distant digital network signal from a satellite television provider. These proposals were based on the Commission's recommendations in the *2005 Report to Congress*.[23] Because the SHVERA provided for measurements as early as April 30, 2006 and measurement rules had not yet been adopted, the Commission specified that it would rely on the proposed DTV measurement procedures for evaluating DTV signal strength pending the adoption of final rules.[24] Those interim procedures have been in effect since adoption of the *SHVERA NPRM* in April, 2006, and to date we have not received any reports of problems or difficulties with their use.

10. In the STELA, Congress again amended the Copyright Act and the Communications Act to renew and make adjustments to the statutory provisions for carriage of distant network television stations by satellite services. Under the new regime, eligibility for receiving distant digital network signals is based on either 1) a prediction of whether the signal of a local station affiliated with the network can be received off-the-air at a specific location or 2) an actual measurement of the local network stations' signal strengths at that location.[25] "Local stations" under the STELA are stations in the same Designated Market Area (DMA) as the household location for which eligibility is being assessed.[26] STELA modifies the definition of "unserved household" in the copyright statute by changing the reference from "a conventional, stationary, outdoor rooftop receiving antenna" to "an antenna."[27] STELA also modifies the signals that are to be considered in the determination of terrestrial service from "an over-the-air signal of a primary network station" to "an over-the-air signal containing the primary stream, or, on or after the qualifying date, the multicast stream, originating in that household's local market."[28]

11. With respect to the methods for determining whether an individual location is unserved by the digital signal of a local network TV station, and therefore eligible for delivery of the signal of a distant station affiliated with the same network, the STELA first requires that the Commission establish a model for predicting the ability of individual locations to receive digital TV signals. Specifically, the STELA amends Section 339(c)(A)(3) of the Communications Act to require that, by November 24, 2010, "the Commission shall develop and prescribe by rule a point-to-point predictive model for reliably and

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[22] *Id., 20 FCC Rcd* 19506.

[23] We note that, in its comments in response to the *SHVERA Inquiry* that preceded the *2005 Report to Congress*, EchoStar submitted a number of proposals related to DTV signal strength measurement, which the Commission rejected as unnecessary or inappropriate. *See 2005 Report to Congress*, at 117-121 and 125-128.

[24] *SHVERA NPRM*, 21 FCC Rcd at 4738 para. 6.

[25] 47 U.S.C. 339(a)(2)(D)(i).

[26] *See* 17 U.S.C. § 119(d)(10)(A), (d)(11), as amended by STELA section 102. In the STELA, the reference to a "local" signal refers specifically to "that household's local market" and the definition in 17 U.S.C. § 122.

[27] *See* 17 U.S.C. § 119(d)(10)(A), as amended by STELA Section 102.

[28] *Id.*

presumptively determining the ability of individual locations, through the use of an antenna, to receive signals in accordance with the signal intensity standard in section 73.622(e)(1) of title 47, Code of Federal Regulations, or a successor regulation, including to account for the continuing operation of translator stations and low power television stations. In prescribing such model," the STELA also provides that "the Commission shall rely on the Individual Location Longley-Rice model set forth by the Commission in CS Docket No. 98–201, as previously revised with respect to analog signals, and as recommended by the Commission with respect to digital signals in its Report to Congress in ET Docket No. 05–182, FCC 05–199 (released December 9, 2005)." The STELA further provides that the Commission "shall establish procedures for the continued refinement in the application of the model by the use of additional data as it becomes available."[29] Second, the STELA requires, on the same schedule as its final action on the predictive model, that the Commission "issue an order completing its rulemaking proceeding in ET Docket No. 06-94 …" and that "[i]n conducting such rulemaking, the Commission shall seek ways to minimize consumer burdens associated with on-location testing."[30]

III. DISCUSSION

A. Predictive Model – Notice of Proposed Rulemaking

12. As recognized and directed by Congress in the STELA, a predictive model is needed to provide presumptive determinations as to whether a household is unserved by local network-affiliated digital full service and digital low power TV and digital TV translator stations. The STELA revises the definition of "unserved household" in three potentially significant ways: 1) the network stations whose signals are to be considered are now limited to those network affiliates in the same DMA as the subscriber; 2) the definition of "unserved household" now references an "antenna" without specifying what kind of antenna or where it is located; and 3) the definition specifically recognizes both a "primary stream" and a "multicast stream" affiliated with a network.[31] We believe the SHVIA ILLR model can be readily modified to predict digital TV signal strengths at individual locations under the new STELA regime and thereby provide presumptive determinations of eligibility for delivery of distant digital signals by satellite carriers in the same manner as it currently provides for analog signals. Use of this model with appropriate modifications for digital signals would also comply with the intent of Congress in the STELA that we rely on the ILLR model as previously revised for analog signals (the SHVIA ILLR model) and the Commission's recommendation in its *2005 Report to Congress* for use in making determinations of eligibility for satellite delivery of distant network signals. The SHVIA ILLR model has proven over time to be an accurate and reliable predictor of analog TV signal strength and has been well accepted by both the broadcast and DBS industries. Through use of this model, consumers, broadcast television stations and satellite television carriers have avoided the need to conduct an actual measurement test every time a satellite customer believes that he or she is unable to receive an adequate signal off-the-air from a local television network-affiliated station. We expect the revised model to provide these same benefits in the digital television environment. We discuss our proposal for the digital signal predictive model below.

[29] *See* STELA, section 204(b)(2), amending section 339(c)(3)(A) of the Communications Act, codified at 47 U.S.C. 339(c)(3)(A).

[30] See STELA, section 204(b)(2), amending section 339(c)(3)(B) of the Communications Act, codified at 47 U.S.C. 339(c)(3)(B).in

[31] *See* 17 U.S.C. § 119(d)(10)(A) as amended by STELA section 102. The STELA specifies that network affiliates broadcast on multicast streams will be considered "on or after the qualifying date," which is defined as "October 1, 2010, for multicast streams that exist on March 31, 2010; and January 1, 2011, for all other multicast streams." 17 U.S.C. § 119(d)(13), as amended by STELA section 102. *See also* 17 U.S.C. § 119(d)(10)(A), (d)(14) and (15), as amended by STELA section 102.

We note that, with the anticipated launch of local-into-local service in all 210 DMAs by Dish Network,[32] the circumstances in which a subscriber would need, or be eligible for, distant signals will be significantly reduced.[33] We therefore anticipate that the predictive model will be used far less frequently than in previous years.[34]

13. *Digital TV ILLR Model Proposal*. We are proposing to modify the SHVIA ILLR model to make it capable of reliably and accurately predicting the field strength of digital television stations and to establish the modified version in our rules as the point-to-point model for determining the ability of individual locations to receive with an antenna the digital television signals of full service television stations, digital low power television stations (including digital Class A stations), and digital TV translator stations. Specifically, we are proposing to adopt the Individual Location Longley-Rice model set forth in CS Docket No. 98-201 as revised for analog signals in the SHVIA proceeding, *i.e.*, the SHVIA ILLR model, with appropriate modifications, as the method for prediction of digital television signal strengths. Consistent with the STELA, we are also proposing to use the DTV noise-limited service contour values in Section 73.622(e)(1) as the standard for determining whether a predicted field strength is sufficient for reception of a signal at an individual location.[35] This "digital TV ILLR model" and standard will be specified as the required method for making presumptive determinations of an individual household's eligibility for satellite retransmission of the distant network signals. We request comment on our proposals for a digital TV ILLR model as set forth herein.

14. The prediction model we are proposing addresses the statutory change in the definition of an unserved household from an "outdoor antenna" to an "antenna" and takes into account terrain, morphology (buildings and similar man-made land uses), and other land cover variations, some of which were recognized in our development of the SHVIA ILLR model but still are yet to be evaluated and accepted by the scientific and technical community.[36] Inasmuch as the digital signals of digital low power TV (including digital Class A) and digital TV translator stations use the same transmission standard as full service stations, we believe that the same model will be capable of serving to provide predictions of the signal strengths of all types of digital TV stations. That is, we tentatively conclude that the same digital TV model will provide predictions that are equally reliable and accurate for full service, low power and TV translator digital signals. We are therefore proposing to use the new digital TV ILLR model for prediction of the signal strengths of all three of these types of digital TV stations. We also believe that this model will account for multicast as well as primary streams that are transmitted by a station and

[32] *See* 17 U.S.C. § 119(g), as amended by STELA section 105 and 47 U.S.C. § 342, as amended by STELA section 206. Dish Network launched 29 markets on June 3, 2010, and now offers local-into-local service in all 210 DMAs. *See DISH Network L.L.C. Application for Qualified Carrier Certification*, MB Docket No. 10-124, Attachment A at ¶ 2 (filed June 30, 2010). *See also* http://dish.client.shareholder.com/releasedetail.cfm?ReleaseID=474211.

[33] The STELA retained the provision that prevents subscribers, in general, from receiving retransmission of distant signals if the local-into-local package is available to them, unless they subscribed to the distant signals before the local package was available. *See* 47 U.S.C. § 339(a)(2), as amended by STELA section 204; *see also* 17 U.S.C. § 119(a)(3), as amended by STELA section 102. Given that both DirecTV and DISH are moving towards making local-into-local packages available in all or nearly all markets, we expect the need for determinations of eligibility for delivery of distant network signals to individual subscribers to decline significantly.

[34] The same analysis applies to the need for and use of signal testing, as discussed *infra*.

[35] Section 73.622(e)(1) provides separate noise-limited contour levels for channels in the low-VHF band (channels 2-6), high-VHF band (channels 7-13) and UHF band (channels 2-51).

[36] The SHVIA ILLR model includes data only for those land use and land cover features that have been evaluated and accepted by the scientific community.

affiliated with one or more networks. We request comment on this proposal and our tentative conclusion. We are also proposing to establish a procedure through which parameters used in the digital TV ILLR model can be adjusted based on new information that may become available and other refinements. This process will provide for continued refinement of the model on the basis of reliable technical information, as it becomes available.

15. The analog SHVIA ILLR model that will serve as the basis for our digital TV ILLR model is similar to the service coverage predictive model we established for evaluating television coverage and interference prediction, as set forth in our Office of Engineering and Technology's (OET) OET Bulletin No. 69.[37] However, whereas the Longley-Rice model for coverage and interference prediction provides estimates of aggregate service availability (including losses due to interference), the SHVIA ILLR model provides estimates only of field strength at individual locations (it does not include consideration of interference). The SHVIA ILLR model does not replace the current Commission rules for field strength contours in Section 73.683 or prediction of coverage for non-satellite distant signal eligibility purposes in Section 73.684. In fact, the SHVIA ILLR model could identify unserved households lying within a station's former Grade B contour and, likewise, identify served households outside that contour.

16. The SHVIA ILLR model incorporates features to account for the radio propagation environment and the receiving system conventionally assumed to be used by viewers to achieve service with an antenna. Given that digital and analog television signals are transmitted in the same frequency bands, the factors affecting propagation of signals using the two different modulation methods and the background noise level are the same. We therefore do not believe that we need to modify any of the features of the SHVIA ILLR model that describe propagation and the background noise levels and are not proposing to modify those elements of the model. We also observe that the "planning factors" that describe a set of assumptions for the television reception system are different in some important respects for analog and digital signals.[38] However, with the exception of antenna location and performance and certain other factors relating to propagation that are discussed below, we do not believe that we need to consider those differences for purposes of the proposed digital TV ILLR model because they are incorporated into the threshold signal level for reception for service, which the STELA directs to be set at the noise-limited levels specified in Section 73.622(e)(1).

17. We also do not see any need for changing the model to reflect the added reference to network affiliated multicast streams. The prediction for a television broadcast signal applies regardless of the content. If a household is predicted to receive a station, then all of that station's broadcast streams may be received. Therefore, we propose to make no special adjustment in the model to implement this change in the definition of unserved households. We request comment on these aspects of the proposed digital TV ILLR model.

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[37] The Longley-Rice model used for analysis of DTV and analog TV service in the DTV proceeding is described in "Longley-Rice Methodology for Evaluating TV Coverage and Interference," OET Bulletin 69, Federal Communications Commission (February 6, 2004), http://www.fcc.gov/oet/info/documents/bulletins/#69. The Longley-Rice method in OET Bulletin No. 69 is the *Commission's* designated methodology for determining where service is provided by a DTV station. *See* 47 C.F.R. 73.622(e). *See also Advanced Television Systems: Sixth Report and Order* ("DTV Sixth Report and Order"), 12 FCC Rcd 14588, 14672-76.

[38] The planning factors for analog television assume a height of 30 feet, which is slightly different from the height of 10 meters (33 feet) used in the digital planning factors. The planning factors for analog TV are provided in Robert A. O'Conner, "Understanding Television's Grade A and Grade B Service Contours," IEEE Transactions on Broadcasting, Vol. BC-14, No. 4, December 1968 (O'Connor) at page 142; the planning factors of digital TV are set forth in OET Bulletin No. 69 at Table 3.

18. The aspects of the SHVIA ILLR model that are different for digital and analog signals and that we need to modify or consider modifying in the new point-to-point predictive model for digital signals include antenna location (outdoor vs. indoor) and performance, time and location variability factors, and land use and land cover. We discuss our proposals for changes to the SHVIA ILLR model to address these aspects in the new digital TV ILLR model for prediction of DTV signal strengths and our proposal for a procedure for the continued refinement of the model as new information may become available in the sections below. The proposed amendments to our rules to implement the new digital TV ILLR model are set forth in Appendix A, and the proposed digital TV ILLR model will be described in a new OET Bulletin No. 73, a draft of which is attached as Appendix B.

19. We propose to uphold any previous findings of eligibility for delivery of distant signals based on the predictive model, in the event that we update the digital TV ILLR model and a prediction from the updated model indicates that the location can receive service from a local network station. We believe that "grandfathering" the eligibility of households in such cases would be appropriate to avoid disruption of the existing services to which households have been accustomed.

20. *Antenna Location and Performance*. We believe that the current standard for an outdoor antenna as specified in the DTV planning factors in OET Bulletin No. 69 should be used in predicting digital television signal strengths at individual locations. As indicated above, the STELA revises the definition of an unserved household by changing the reference to the antenna used to receive service from a "conventional, stationary outdoor rooftop antenna" to an "antenna." The reception model (planning factors) for digital television service assumes that a viewer uses an outdoor antenna with a certain level of gain mounted at 10 meters (33 feet) above ground (roof-top level).[39] Those antenna location and performance parameters are reflected in the field strength values defining the analog Grade B and digital noise-limited contours in Sections 73.683(a) and 73.622(e)(1), respectively. The STELA mandates use of the digital television signal strength standard in Section 73.622(e)(1) or a successor regulation. Thus, we believe that STELA's specification of the signal strength intensity standard incorporated into our rules implies use of an outdoor antenna to receive service.[40]

21. However, we believe that Congress's use of the term "antenna" in the STELA grants the Commission greater flexibility to take into account different types of antennas than was previously available. In addition, Congress and representatives of the direct broadcast satellite industry have previously raised concerns as to whether we should consider certain issues relating to the location and performance of actual antennas consumers use to receive DTV signals. In the SHVERA, Congress directed the Commission to investigate whether the noise-limited DTV service standard should be revised to take into account the types of antennas that are available to consumers.[41] The Commission concluded

[39] *Id.*

[40] There is no discussion of the change in the reference to the receive antenna from a "conventional, stationary, outdoor rooftop antenna" to an "antenna" in the legislative history of the STELA.

[41] *See* 47 U.S.C. 339(c)(1)(B). Congress indicated that the Commission was to specifically consider: 1) whether to account for the fact that an antenna can be mounted on a roof or placed in a home and can be fixed or capable of rotating, 2) whether there is a wide variation in the ability of reasonably priced consumer digital television sets to receive over-the-air signals such that at a given signal strength some may be able to display high-quality pictures while others may not, whether such variation is related to the price of the television set, and whether such variation should be factored into setting a standard for determining whether a household is unserved by an adequate digital signal, and 3) whether to account for factors such as building loss, external interference sources, or undesired signals from both digital television and analog television stations using either the same or adjacent channels in nearby markets, foliage, and man-made clutter. The Commission addressed these issues in its *2005 Report to Congress*, 20 FCC Rcd 19504 (2005) at ¶¶ 21-45.

in the *2005 Report to Congress* that the existing DTV planning factor assumptions for antenna gain, orientation, and placement were appropriate and should not be altered.[42] It also specifically concluded that the digital television signal strength standards in the Commission's rules should not be modified to account for the fact that an antenna can be mounted on a roof or placed within a home and can be fixed or capable of rotating.[43] In this regard, it concluded that it would be impractical to attempt to account for indoor reception conditions in the DTV planning factors and also stated that it would be impracticable to establish a regime whereby households with indoor antennas are subject to different signal strength standards than those with outdoor antennas. It noted that difficulty would arise in setting and applying standards for situations in which a household could not use an outdoor antenna.

22. In view of the Commission's findings in the *2005 Report to Congress* and the relevance of those findings to the digital signal intensity standard that Congress specified in the STELA, we believe that the current standard for an outdoor antenna as specified in the DTV planning factors should be used in predicting digital television signal strengths at individual locations. We are therefore proposing to include that outdoor antenna standard (with some adjustments for height consistent with the analog ILLR model[44]) in the new digital TV ILLR model that will be used in making distant signal eligibility determinations under the STELA. We also believe that it would be appropriate to use the receive antenna gain and front-to-back ratios specified in the planning factors for the performance capabilities of the outdoor receive antenna used in making predictions, as those values are consistent with the DTV noise-limited service contour standard in Section 73.622(e)(1) and outdoor antennas performing at (or better) than those values are readily available.[45] We request comment on these proposals, including whether we should adopt gain and front-to-back specifications for the receive antenna that are different from those set forth in the planning factors.

23. Using the outdoor model may result in instances where a consumer who either cannot use an outdoor antenna or cannot receive service using an outdoor antenna[46] and is not able to receive a station's service with an indoor antenna will be found ineligible for satellite delivery of a distant network signal. We remain concerned about such instances, and therefore are again inviting comment and suggestions and new information that would provide a solution for those satellite television subscribers who are either not able to use an outdoor antenna or cannot receive service using an outdoor antenna and cannot receive service with an indoor antenna. In this regard, we are particularly interested in new ideas and information that have been developed in the time since the *2005 Report to Congress*. For commenters who advocate including an indoor antenna in the model, we request detailed technical information regarding the specific standards to be used for all aspects of the transmission path including antenna characteristics, building penetration loss, multipath effects, etc. In addition, such commenters should provide detailed information regarding how those parameters should be applied within a standard

[42] The full text of the Commission's findings with regard to TV receive antenna issues is set forth in the *2005 Report to Congress*, 20 FCC Rcd 19525-19527.

[43] 47 U.S.C. 339(c)(1)(B)(i).

[44] The standard has been to use an antenna height of 6 meters (20 feet) for a one-story building and 9 meters (30 feet) for taller buildings.

[45] The DTV planning factors specify receive antenna gain values of 4 dBd, 6 dBd, and 10 dBd, and front-to-back ratios of 10 dB, 12 dB, and 14 dB for low-VHF, high-VHF and UHF channels, respectively. *See* OET Bulletin No. 69 at Table 3.

[46] For example, a satellite subscriber may only have the option of placing an antenna on the south side of a building along with the satellite dish and be unable to receive over-the-air reception from stations broadcasting from the north.

model given the variety of situations that could arise, and how to develop a model that would also be valid for consumers with outdoor antennas. We seek comment on how to develop a model that could vary depending on whether the subscriber lives in a multiple dwelling unit or a single family home, or whether the household is in an urban area or in a rural area. Further, we seek comment on how to ensure that such a flexible model would not be abused by specification of incorrect parameters describing the location for which a prediction is to be made.

24. *Time and Location Variability Factors*. Consistent with our findings in the *2005 Report to Congress*, as discussed below, we are proposing to modify the time variability factor of the SHVIA ILLR model to 90% as used in the DTV planning factors and to continue to use 50% as the location variability in the digital TV ILLR model. We request comment on these proposals. Parties commenting on this issue who believe that alternative specifications for the time and location variability factors should be used are requested to provide new information, data and analyses that were not available at the time of the Inquiry to support their positions.

25. The field strength of television signals, like that of other radiofrequency signals, varies with time and location. That is, television signal strengths vary over time at the same location and also vary from location to location, often very short distances apart, when observed at the same time. These variations of field strength with time and location are incorporated into the television planning models. For analog TV, the SHVIA ILLR model defines service using the F(50,50) field strength curves. We note that DTV service differs in that it is based on use of F(50,90) field strength curves, as derived from the F(50,50) and F(50,10) field strength curves in Section 73.699 of our rules, to define a DTV station's noise-limited contour.[47] The F(50,90) service contour means at least 50% of the locations can be expected to receive a signal that exceeds the field strength value at least 90% of the time. We also note that the field strength standard for analog reception (the Grade B contour value) incorporates an adjustment to raise the F(50,50) values to F(50,90).

26. In comments responding to the SHVERA Inquiry preceding the *2005 Report to Congress*, EchoStar and H&E argued that the time variability assumption that a signal is available at least 90% of the time should be increased to 99% to avoid time periods when the signal would not be available. H&E submitted that it had collected temporal data on the amplitudes of fourteen DTV signals that could be received at its Sonoma, California offices and it found that variation in signal strength around the median for six of the stations to be about 3.5 dB and 4.9 dB for 90% probability at high VHF and UHF, respectively. It argued that 4.7 dB and 17.5 dB would need to be added to the high VHF and UHF signal strength standards to increase to the 99% probability level. Broadcasters, as represented by the consulting engineers Meintel, Sgrignoli and Wallace (MSW), the NAB and the Network Affiliates opposed such changes, arguing that the statistical nature of the probability function means that any dips below the digital signal strength threshold will be randomly spaced over very long time periods and thus have no meaning in the sense of a consecutive time period. They submitted that it would be unfair to broadcasters to change the statistical definition of DTV service in that a change to 99% probability would greatly shrink local service areas.

27. The Commission did not find EchoStar's and H&E's position on changing the time variability factor values for DTV persuasive. In this regard, it noted that radiofrequency signal propagation is always statistical in nature and that the power and/or antenna height needed to approach

[47] *See* 47 C.F.R. § 73.699, Figures 9-10c. In the case of analog TV service, the median F(50,50) planning factors include adjustments to the time variability factors in order to provide for service at 50% of locations 90% of the time. Those values subtract 6 dB at low VHF, 5 dB at high VHF, and 4 dB at UHF to the F(50,90) contour values to define the F(50,50) analog Grade B contour values given in the rules.

100% reliability increases in a non-linear manner. The Commission also observed that the current values were established based on an industry-Government consensus that relied on the traditional TV service model that worked well for analog TV service and that, as argued by the broadcasters, changing the time variability factor values to 99% reliability would greatly shrink local DTV service areas. It further observed, as pointed out by MSW, that the assumed 10% reduction in service availability occurs at the outermost limit of a station's service area and is not the typical figure for time reliability across a station's entire service area. As the distance to a station's transmitter decreases, time availability increases. The Commission stated that households at the edge of a station's service area could also improve their reception (and thereby reduce or eliminate periods when the station's signal is not available) by mounting their antennas higher, using higher gain antennas, or using low-noise pre-amplifiers at their antennas. No commenter suggested changing the location variability factor and the Commission stated that it knew of no considerations that would lead it to recommend changing from the current median value for this factor. We seek comment on whether there should be any changes to this factor in the context of digital signals, which are subject to the so-called cliff effect.[48]

28. *Land Use and Land Cover Factors*. The land use and land cover ("LULC") data provides information on building structures and other man-made terrestrial features and on other land cover variations such as forests and open land that can affect radio propagation. Inclusion of this data in the prediction methodology of the SHVIA ILLR TV computer model significantly enhanced the accuracy and reliability of its signal strength predictions. The method for considering these land cover factors is to assign certain signal loss values, in addition to those already implicit in the model, as a function of the LULC category of the reception point.[49] More specifically, the field strength predicted by the basic Longley-Rice model is reduced by the clutter loss value associated with the respective LULC category.[50] Reception point environments at individual locations are classified in terms of the codes used in the LULC database of the United States Geological Survey (USGS).[51]

29. We are proposing to continue to apply the LULC categories and clutter loss values for describing land use and land cover features in the digital TV ILLR model in the same manner as currently incorporated into the SHVIA ILLR model. These values were specified in the *SHVIA First Report and Order*.[52] We recognize that these parameters were the subject of differing views in the inquiry we conducted in preparing the *2005 Report to Congress*. Therein, we concluded that the clutter loss values used in the current SHVIA ILLR model strike the correct balance, noting that this has been borne out by the data on the model's performance, which shows that using the values adopted by the Commission for the SHVIA ILLR model produce approximately an equal number of over-predictions as under-predictions.[53] Thus, we have found a range of values, including zero, that correspond to different land

[48] The "cliff-effect" is a characteristic of digital television service whereby the picture and/or audio are lost quickly and completely when the signal level falls below the minimum threshold needed for service. This contrasts with the gradual degradation of picture and audio quality with lower signal levels that occurs with analog television service.

[49] A full description and discussion of the modifications that were made to the Longley-Rice 1.2.2 model to include the LULC data is provided in the *SHVIA First Report and Order*, 15 FCC Rcd 12122-12127.

[50] The current 10 environmental LULC classes and values used with the SHVIA ILLR model are shown in Tables 2 3 of OET Bulletin No. 72.

[51] The LULC database is provided by the USGS. *See* USGS website at http://edcwww.cr.usgs.gov/glis/hyper/guide/1_250_lulc.

[52] *See SHVIA First Report and Order*, 15 FCC Rcd 12126.

[53] *See 2005 Report to Congress, 20* FCC Rcd 19569.

cover types are valid. We also observe that the Commission further indicated that it believed that for any digital model that may be developed, the values currently in use for the analog model would similarly yield accurate results. We request comment on the appropriate clutter loss values for predicting digital television field strengths. We are particularly interested in new information and data that may have been developed since 2005. In this regard, we also request comment and information regarding any of the additional LULC categories and data that, at the time of our development of the SHVIA ILLR model, were yet to be evaluated and accepted by the scientific and technical community and have since become accepted by that community.

30. *Analog Low Power TV and TV Translator Stations*. With respect to the continued operation of analog Low-Power Television (LPTV), Class A, and TV Translator stations that retransmit in analog format the content of local digital network-affiliated television stations, we tentatively conclude that the existing predictive methods specified in FCC OET Bulletin No. 72 should continue to apply. The STELA requires the Commission "… to account for the continuing operation of translator stations and low power television stations."[54] Although all full-service television stations were converted fully to digital operation by June 12, 2009, LPTV, Class A, and TV Translator stations were not required to convert and most of those stations continue to broadcast in analog format. For those stations, we believe that there is no reason to change the SHVIA ILLR model that has been in use for several years, and so propose to continue to specify the procedure described in OET-72 for determining the eligibility of viewers with respect to those analog stations.

31. *Procedure for Continued Refinement of the Digital TV ILLR Model*. As indicated above, the STELA requires that the Commission establish procedures for continued refinement in the application of the digital TV ILLR model through use of additional data as it becomes available. We believe the most efficient, effective, fair, transparent and timely approach for revising the digital TV ILLR model if new information becomes available is to hold open the docket in this proceeding and conduct further rule making to consider possible changes to OET Bulletin No. 73 (which will describe the model and be referenced in our rules) to implement improvements to the model. This proposal is consistent with the Commission's past action concerning the SHVIA model. Given that the model will be incorporated into our rules, we believe that this proposal also is consistent with the requirements of Section 553 of the Administrative Procedures Act.[55] Under this proposal, parties with new data, analysis or other information relating to improving the predictive model could submit requests to modify the model under the instant docket. OET would evaluate such requests and prepare a Notice of Proposed Rulemaking for consideration by the Commission. The Commission also could initiate rulemaking action on its own motion. We invite comment on this proposal to use our standard notice and comment rulemaking procedure for updating the digital TV ILLR model and its applications and also ask for suggestions for modifications and alternative plans. *Stations to Consider for Distant Signals*. We do not propose to modify the proposed digital TV ILLR model to address the STELA provision that a subscriber is eligible for delivery of distant network signals only if he or she is unserved by stations located in the same DMA. As discussed above, under the SHVIA and the SHVERA, the predicted signal strengths of all the stations affiliated with the same network were considered, regardless of those stations' DMAs.[56] That is, if a satellite subscriber wanted to receive the distant signal of the XYZ network, then the predicted results from any XYZ network affiliated stations would be analyzed for that subscriber's location and if one or

[54] *See* 47 U.S.C. § 339(c)(A)(3)(A), as amended by STELA section 204.

[55] *See* 5 U.S.C. 553.

[56] See previous definition of "unserved household" in 17 U.S.C. § 119(d)(10)(A), prior to amendment by STELA section 102.

more of those affiliated stations were predicted to deliver a signal of the requisite intensity, the subscriber would be predicted "served" by that network and not eligible for a distant signal from that network unless each of the stations predicted to serve the subscriber granted a waiver.[57] The STELA changes this regime by specifying that only "local" stations are to be considered, *i.e.*, stations that are located in the same DMA as the satellite subscriber instead of examining any station of the same network regardless of DMA.[58]

32. Rather than modify the proposed digital TV ILLR model itself to address this change, we propose to change the way the model's results are to be used. That is, instead of considering any network station that the model predicts to be available in the determination of a subscriber's eligibility for a distant signal, we propose to require satellite carriers to consider only the signals of network stations located in the subscriber's DMA. We seek comment on this proposal. We note that this statutory change will reduce the number of stations that need to be considered when determining eligibility for distant network signals and thereby also reduce the burden associated with waiver requests by reducing the number of stations from which a waiver would have to be requested. As noted below, this statutory change will also reduce the testing burden. We also seek comment on any other methodological or other changes the Commission should consider to minimize consumer burdens.

B. On-Site Signal Measurement – Further Notice of Proposed Rulemaking

33. As indicated above, the STELA, similar to the SHVERA, provides that if the ILLR model predicts that a satellite subscriber receives a local network station of sufficient field strength, the subscriber may request an on-site signal strength test to determine definitively whether a local signal can be received at his/her location at the specified signal intensity and directs the Commission to complete its rulemaking proceeding in ET Docket No. 06-94 on establishment of a measurement procedure.[59] The procedure is to be used to determine whether the signal of a network-affiliated station is of sufficient intensity (field strength) to be received at the subscriber's location, *i.e.*, meets or exceeds the standard in Section 73.622(e)(1) of our rules. Essentially, the measurement procedure provides an option for obtaining an empirical, rather than predictive, determination of the signal strength available at a location. The results of measurements would be considered more accurate than the results of the predictive model in all cases. Because the measurement procedure and predictive model are both intended to determine the same issue, the underlying service model and planning factors on which each is based need to be consistent (and our proposals for the predictive model herein and for the measurement procedure in the *SHVERA NPRM* use the same service model/planning factors).

34. The STELA raises three issues regarding the measurement procedure not addressed in the *SHVERA NPRM*: 1) the stations whose signals are to be measured; 2) the antenna to use in performing on-location testing; and 3) the program stream from a station in the market to be measured.[60] Generally, the commenting parties in ET Docket No, 06-94 agreed with our proposals to largely base the measurement procedures for digital television signals on those already in use for measuring analog signals with specific modifications to account for the differences between analog and digital television signals. We seek comment on any new developments or changed positions in order to update the record. To the extent that commenters' positions remain the same, they need not submit additional or repetitive

[57] 47 U.S.C. § 339(c)(2).

[58] *See* note [26], *supra*.

[59] See STELA, section 204(b)(2)(A), amending Section 339(c)(3)(B) of the Communications Act.

[60] *See* note [31], *supra*.

comments reiterating information and positions that were previously filed.

35. Stations to be Tested. As indicated above, the STELA differs from the SHVIA and SHVERA in that it specifies that only "local" stations, *i.e.*, stations located within the same DMA as the subscriber's household, are to be considered in determining a subscriber's eligibility. This change similarly affects the measurement procedures. Previously, a testing entity had to measure the signals of all stations affiliated with a specific network. However, under the STELA, a testing entity is to consider only the signals of those network-affiliated stations that are located in the same DMA as the satellite subscriber. We propose to modify our proposed rules for measurement of DTV signals for purposes of determining eligibility for delivery of distant network signals by satellite providers to incorporate this change.[61] We seek comment on this proposal. As noted above, the statutory change could reduce burdens on both testers and consumers as fewer stations would need to be tested, which should result in lower costs for consumers and consume less time. Consistent with the STELA's direction that we seek ways to minimize consumer burdens associated with on-location testing, we request comment and suggestions regarding steps we could take to further minimize the burden of on-location testing on consumers.

36. Indoor Measurements. We propose the same approach with regard to measurement of digital television signal strengths as proposed above with regard to the digital TV ILLR model: to limit measurement to outdoor antennas. The discussion in the *SHVERA NPRM* only addressed outdoor signal measurements, as the SHVERA specified use of an outdoor antenna. In view of the above-discussed change in the STELA from the term "conventional, stationary, outdoor rooftop receiving antenna" to the term "antenna," we are revisiting the issue of the antenna to be used in testing. The principal alternative to a conventional, stationary outdoor antenna that is currently used by consumers is a moveable indoor antenna. As noted in the NPRM discussion above, in the *2005 Report to Congress* the Commission concluded that many factors make it impractical to develop a simple, reliable and accurate model of indoor television reception. Those same factors, including the performance expected of an indoor antenna, the placement of the antenna, and the location within a structure or room where the antenna is located make it difficult to develop an indoor television signal measurement procedure. First, because of the variability of indoor reception conditions across different structures and in different rooms and locations within the same structure, there is no standard model and planning factors for indoor reception, and in particular there is no standard antenna specification for such reception.[62] The wide variation in indoor viewing situations makes it difficult to specify a standard model that meaningfully relates to any typical indoor viewing location. In addition, the performance of indoor antennas available to consumers varies significantly. Second, signal strengths typically vary significantly at different locations within a room and so there is the question of where to place the antenna - should it be in the center of the room, next to a wall or a window, or at the location of the television? What if the consumer changes the location of the television in the future? Also, there are questions regarding antenna height. Should the

[61] In the ET Docket No. 06-94, the Commission proposed to add a new paragraph 73.686(e) incorporating rules for conducting DTV field strength measurements. We now propose to modify the proposed rule 73.686(e)(iii) of that NPRM to read as follows: (iii) Multiple signals. (1) If more than one signal is being measured (i.e., signals from different transmitters), use the same locations to measure each signal. (2) For establishing eligibility of a satellite subscriber to receive distant network signals, only stations affiliated with the network in question that are located in the same Nielson Designated Market Area (DMA) may be considered and tested.

[62] The outdoor DTV antenna planning factors include antenna gain of 4 dBd, 6 dBd, and 10 dBd for Low VHF, High VHF, and UHF, respectively, downlead line loss of 1 dB, 2 dB, and 4 dB for Low VHF, High VHF, and UHF, respectively, antenna height of 10 meters, and front-to-back ratios of 10 dB, 12 dB, and 14 dB for Low VHF, High VHF, and UHF, respectively. *See* OET Bulletin No. 69, "Longley-Rice Methodology for Evaluating TV Coverage and Interference," February 06, 2004.

testing antenna be placed one or two meters or some other distance above the floor?

37. In addition to the practical difficulties of specifying a standard model for indoor reception, as discussed above, the signal intensity standard in Section 73.622(e)(1) assumes an outdoor antenna. For these reasons, we are proposing not to specify a procedure for indoor measurement of DTV signal strengths. We are, however, requesting comments and suggestions for alternative approaches for making eligibility determinations for situations where consumers are not able to use an outdoor antenna to receive local television signals. Such approaches could include options for measurement of signals indoors. Commenters advocating development of a procedure for indoor measurement of DTV signals should provide detailed technical information on all aspects of such procedures, including a standard indoor antenna and specific measurement procedures that address the considerations indicated above. Such parties are also requested to specify proposals for indoor measurement that would be suitable for adoption into our rules.

38. *Multicast signals*. We tentatively conclude not to adopt special testing procedures to measure network signals that are transmitted on multicast streams, rather than on a primary stream. The testing protocol measures a station's signal at the subscriber location. Whether the station's signal includes one or more program streams or networks, there is no change needed in the test employed because the presence of multiple streams has no bearing on the signal intensity or receivability. We believe the tester, the satellite carrier and the network affiliate involved in the conduct of the test will be able to identify the network affiliates in the broadcast signal. If the signal is found to be available at the subscriber location at the requisite intensity, then any and all of the networks in that signal will likewise be available. If the station's signal is not found to be present at the requisite intensity, the subscriber will be unserved with respect to the networks broadcast on the streams in that signal, unless the subscriber receives a signal of sufficient strength from another local station affiliated with the same network or networks. We seek comment on this tentative conclusion.

IV. PROCEDURAL MATTERS

A. Initial Regulatory Flexibility Certification

39. The Regulatory Flexibility Act of 1980, as amended (RFA),[63] requires that an initial regulatory flexibility analysis be prepared for notice and comment rulemaking proceedings, unless the agency certifies that "the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities."[64] The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."[65] In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.[66] A "small business concern" is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria

[63] The RFA, *see* 5 U.S.C. § 601-612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

[64] 5 U.S.C. § 605(b).

[65] 5 U.S.C. § 601(6).

[66] 5 U.S.C. § 601(3) (incorporating by reference the definition of "small business concern" in the Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register."

established by the Small Business Administration (SBA).[67]

40. In the Notice, we propose to amend our rules to prescribe a point-to-point predictive model for reliably and presumptively determining the ability of individual locations, through use of an antenna, to receive signals in accordance with the signal intensity standard in Section 73.622(e)(1) of the Commission's rules, 47 C.F.R. § 73.622(e)(1), or a successor regulation, including the ability to account for the continuing operation of low power television and TV translator stations.

41. Television station licensees, Direct Broadcast Satellite (DBS) operators, and other Direct to Home (DTH) Satellite operators may use the proposed technique to establish the eligibility or non-eligibility of individual households for satellite delivery of distant television programming. These determinations will usually be made at the point of sale of satellite receiving equipment for homes and will tend to increase the number of eligible customers. The changes we propose are of a technical, scientific nature, without a substantial economic impact. In addition, the primary economic impact of these proposals will be their indirect effect on individual consumers.

42. Therefore, we certify that the proposals in this Notice of Proposed Rulemaking, if adopted, will not have a significant economic impact on a substantial number of small entities. If commenters believe that the proposals discussed in the Notice require additional RFA analysis, they should include a discussion of these issues in their comments and additionally label them as RFA comments. The Commission will send a copy of the Notice, including a copy of this initial certification, to the Chief Counsel for Advocacy of the SBA.[68] In addition, a copy of the Notice and this initial certification will be published in the Federal Register.[69]

B. Further Initial Regulatory Flexibility Act Analysis

43. *Further Initial Regulatory Flexibility Analysis*. As required by the Regulatory Flexibility Act of 1980, as amended (RFA),[70] the Commission has prepared a Further Initial Regulatory Flexibility Analysis (Further IRFA) of the possible significant economic impact on a substantial number of small entities by the policies and rules proposed in this Further Notice of Proposed Rulemaking (Further Notice). The Further IRFA is set forth in Appendix C. Written public comments are requested on this Further IRFA. Comments must be identified as responses to the Further IRFA and must be filed by the deadlines for comments on the Further Notice. The Commission will send a copy of this Further Notice, including this Further IRFA, to the Chief Counsel for Advocacy of the Small Business Administration (SBA).[71] In addition, the Further Notice and Further IRFA (or summaries thereof) will be published in the Federal Register.[72]

C. Paperwork Reduction Act Analysis

44. This document does not contain proposed information collection(s) subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104-13. In addition, therefore, it does not contain

[67] 15 U.S.C. § 632.

[68] *See* 5 U.S.C. § 605(b).

[69] *See* 5 U.S.C. § 605(b).

[70] *See* 5 U.S.C. § 603. The RFA, *see* 5 U.S.C. §§ 601–612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

[71] *See* 5 U.S.C. § 603(a).

[72] *Id*.

any new or modified "information collection burden for small business concerns with fewer than 25 employees," pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, *see* 44 U.S.C. 3506(c)(4).

D. Filing Requirements

45. Ex Parte Rules – Permit-But-Disclose Proceeding. This is a permit-but-disclose notice and comment rulemaking proceeding. Ex parte presentations are permitted, except during the Sunshine Agenda period, provided they are disclosed as provided in the Commission's rules. *See generally* 47 C.F.R. §§ 1.1202, 1.1203, and 1.1206(a).

46. Pursuant to sections 1.415 and 1.419 of the Commission's rules, 47 CFR §§ 1.415, 1.419, interested parties may file comments and reply comments on or before the dates indicated on the first page of this document. Comments may be filed using: (1) the Commission's Electronic Comment Filing System (ECFS), (2) the Federal Government's eRulemaking Portal, or (3) by filing paper copies. *See Electronic Filing of Documents in Rulemaking Proceedings*, 63 FR 24121 (1998).

- Electronic Filers: Comments may be filed electronically using the Internet by accessing the ECFS: http://fjallfoss.fcc.gov/ecfs2/ or the Federal eRulemaking Portal: http://www.regulations.gov.

- Paper Filers: Parties who choose to file by paper must file an original and four copies of each filing. If more than one docket or rulemaking number appears in the caption of this proceeding, filers must submit two additional copies for each additional docket or rulemaking number.

  Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail. All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission.

  - All hand-delivered or messenger-delivered paper filings for the Commission's Secretary must be delivered to FCC Headquarters at 445 12th St., SW, Room TW-A325, Washington, DC 20554. The filing hours are 8:00 a.m. to 7:00 p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes must be disposed of before entering the building.

  - Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Hampton Drive, Capitol Heights, MD 20743.

  - U.S. Postal Service first-class, Express, and Priority mail must be addressed to 445 12th Street, SW, Washington DC 20554.

People with Disabilities: To request materials in accessible formats for people with disabilities (braille, large print, electronic files, audio format), send an e-mail to fcc504@fcc.gov or call the Consumer & Governmental Affairs Bureau at 202-418-0530 (voice), 202-418-0432 (tty).

47. For further information, contact Alan Stillwell, Office of Engineering and Technology, (202) 418-2925 or Robert Weller, Office of Engineering and Technology, (202) 418-7397.

V. ORDERING CLAUSES

48. Accordingly, IT IS ORDERED that pursuant to Sections 1, 4, 301, and 339(c)(3) of the Communications Act of 1934, as amended, 47 U.S.C. Sections 151, 154, 301, 339(c)(3), and Section

119(d)(10)(a) of the Copyright Act, 17 U.S.C. § 119(d)(10)(a), this NOTICE OF PROPOSED RULEMAKING and FURTHER NOTICE OF PROPOSED RULEMAKING IS HEREBY ADOPTED.

49. IT IS ALSO ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this NOTICE OF PROPOSED RULEMAKING and FURTHER NOTICE OF PROPOSED RULEMAKING, including the Initial Regulatory Flexibility Certification, and Further IRFA, to the Chief Counsel for Advocacy of the Small Business Administration.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

APPENDIX A

Proposed Rules

For the reasons set forth in the preamble, the Federal Communications Commission proposes to amend Part 73 of title 47 of the Code of Federal Regulations to read as follows:

PART 73 – RADIO BROADCAST SERVICES

1. The authority citation for Part 73 continues to read as follows:

   Authority: 47 U.S.C. 154, 303, 334, 336 and 339.

2. Section 73.683(d) is amended to read as follows:

(d) For purposes of determining the eligibility of individual households for satellite retransmission of distant network signals under the copyright law provisions of 17 U.S.C. 119(d)(10)(A), field strength shall be determined by the Individual Location Longley-Rice (ILLR) propagation prediction model. Guidance for use of the ILLR model for these purposes in predicting the field strength of analog television signals is provided in OET Bulletin No. 72 (stations operating with analog signals include some Class A stations licensed under Part 73 of this chapter and some low power TV and TV translator stations licensed that operate under Part 74 of this chapter). Guidance for use of the ILLR model for these purposes in predicting the field strength of digital television signals is provided in OET Bulletin No. 73 (stations operating with digital signals include all full service stations and some Class A stations that operate under Part 73 of this chapter and some low power TV and TV translator stations that operate under Part 73 or Part 74 of this chapter). OET Bulletin No. 72 and OET Bulletin No. 73 are available at the FCC's Headquarters Building, 445 12th St., SW, Reference Information Center, Room CY-A257, Washington, DC, or at the FCC's Office of Engineering and Technology (OET) webs site: http://www.fcc.gov/oet/info/documents/bulletins/.

APPENDIX B

Proposed OET Bulletin No. 73

"The ILLR Computer Program for Predicting DTV Coverage"

FCC/OET-73

OET BULLETIN

OFFICE OF ENGINEERING AND TECHNOLOGY

FEDERAL COMMUNICATIONS COMMISSION

The ILLR Computer Program for Predicting DTV Coverage

DRAFT

July 7, 2010

THE ILLR COMPUTER PROGRAM FOR PREDICTING DTV COVERAGE

INDIVIDUAL LOCATIONS

July 15, 2010

I. Introduction

In the Satellite Television Extension and Localism Act of 2010 (STELA), Congress instructed the Commission to "develop and prescribe by rule a point-to-point predictive model for reliably and presumptively determining the ability of individual locations, through the use of an antenna, to receive digital television broadcast signals of network affiliated stations in accordance with the signal intensity standard in section 73.622(e)(1) of title 47, Code of Federal Regulations, or a successor regulation."[1] As codified in Section 339(c)(3) of the Communication Act, this law further provides that "[i]n prescribing such model, the Commission shall rely on the Individual Location Longley-Rice [ILLR] model set forth by the Federal Communications Commission in Docket No. 98-201 and ensure that such model takes into account terrain, building structures, and other land cover variations."[2] Terrain features (such as hills), buildings, and land cover (such as forests) have a major effect on the strength of received signals, and Congress instructed the Commission to make the predictive model as accurate as possible by taking these factors into account. In the Satellite Home Viewer Improvement Act of 1999 (SHVIA), Congress previously required that, in determining household eligibility for reception of satellite retransmission of analog TV broadcast network signals, the courts rely on the ILLR model for making a presumptive determination of whether a household is capable of receiving the over-the-air signal of the local station affiliated with that network with at least a certain threshold intensity of signal strength.[3]

This bulletin publishes the detailed definition on the model for making point-to-point predictions of the intensity of digital television (DTV) signals adopted by the Commission as prescribed under the STELA. The model uses an ILLR computer program for DTV stations that is based generally on the ILLR program for analog stations previously-established by the Commission in the SHVIA *First Report and Order* in ET Docket No. 00-11 adopted May 22, 2000.[4] This new version of the ILLR computer program computes the predicted signal strength of DTV stations as received over-the-air at individual viewing locations. Individual locations where a network TV signal is below the prescribed signal strength level are eligible to receive distant network broadcast as subscribers of satellite TV services. The program is used by Satellite TV service providers to determine whether particular TV network signals may be included in the package of channels delivered to individual subscribers. To facilitate use of the program by others, this bulletin provides details for combining the program elements on other computers.

As defined by STELA, a viewer location is "served," or "unserved," depending on whether the signal strength received at that location is at least equal to, or is less than, the noise-limited service level with a

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[1] See Satellite Television Extension and Localism Act of 2010, Title V of the American Workers, State, and Business Relief Act of 2010 ("STELA"), Pub.L. 111-175, 124 Stat. 1218 (2010) relating to copyright licensing and carriage of broadcast signals by satellite carriers, codified in scattered sections of 17 and 47 U.S.C; *see also* 47 C.F.R. § 73.622(e)(1).

[2] In CS Docket No. 98-201 the Commission endorsed a prediction procedure it referred to as the Individual Location Longley-Rice model. See *Satellite Delivery of Network Signals to Unserved Households for Purposes of the Satellite Home Viewer Act; Part 73 Definition and Measurement of Signals of Grade B Intensity*, adopted February 1, 1999, 14 FCC Rcd 2654 (1999).

[3] Satellite Home Viewer Improvement Act of 1999 (SHVIA), Pub.L. 106-113, 113 Stat. 1501, 1501A-526 to 1501A-545 (Nov. 29, 1999), codified in the Communications Act at 47 U.S.C. § 339(c)(3). 17 U.S.C. § 119(a)(2)(B)(ii)(I).

[4] *See* Report and Order in CS Docket No. 98-201 (SHVA Report and Order), 14 FCC Rcd 2654 (1999).

certain statistical probability as set forth in FCC Rules.[5] A location found by the ILLR prediction program to be "served" by the signal of a network affiliate station is not entitled to receive satellite transmission of that same network programming. To complement this predictive model, the STELA also mandated establishment of a procedure for on-site testing that may be used for empirically determining signal intensity levels when satellite carriage of network is denied to a subscriber as a result of a predictive determination by the ILLR program. The Commission's on-site measurement procedure for digital television signals as prescribed under the STELA is set forth in Section 73.686 of the rules.[6]

II. The Individual Location Longley-Rice (ILLR) Computer Program for DTV Stations

A. Availability of Software and Databases

Software and Computer Database Requirements to Implement the ILLR Program model are available from the Department of Commerce as discussed below. The software must be combined with terrain elevation data and also with a database describing the local environment of building structures and vegetation. Terrain elevation data and the Land Use and Land Clutter (LULC) database are both available from the U.S. Geological Survey (USGS). To set up a program to run, the source code for the Department of Commerce's Longley-Rice radio propagation prediction model must be compiled with specific parameter values and linked with the terrain elevation data. Finally, a computerized lookup table of local environment values must be constructed from the USGS LULC database. A computer program complying with the technical details specified herein will qualify as the Individual Location Longley-Rice (ILLR) propagation prediction model for DTV stations.

B. Using the ILLR Computer Program

A determination of the served or unserved status of a particular location is made by finding its latitude and longitude coordinates (typically using GPS, maps or geocoding services) and technical information about the desired network affiliated broadcasting station. The ILLR computer program is applied using this information.

C. Implementation of Computer Source Code

Computer code for the Longley-Rice radio propagation prediction model is published in an appendix to NTIA Report 82-100, *A Guide to the Use of the ITS Irregular Terrain Model in the Area Prediction Mode*, authors G.A. Hufford, A.G. Longley and W.A. Kissick, U.S. Department of Commerce, April 1982. The report may be obtained online from the U.S. Department of Commerce, or from the National Technical Information Service, Springfield, Virginia, by requesting Accession No. PB 82-217977. Some modifications to the code were described by G.A. Hufford in a memorandum to users of the model, dated January 30, 1985. With these modifications, the code is referred to as Version 1.2.2 of the Longley-Rice model. It is available for downloading at the U.S. Department of Commerce Web site, http://flattop.its.bldrdoc.gov/itm.html. This computer software model, when used with the appropriate parameters, is the ILLR model.

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[5] *See* 47 C.F.R. § 73.622(e). The signal strength values for noise-limited digital television service are 28 dBμV/m for TV channels 2-6; 36 dBμV/m for channels 7-13; and 41 dBμV/m (adjusted by a dipole factor equal to 20 log [615/(channel mid-frequency in MHz)] for channels 14 and above. These signal strength values are to be used in all cases, whether the DTV station is full-service, Class A, Low Power, or a DTV Translator.

[6] *See* 47 C.F.R. § 73.686.

The ILLR model was adopted for STELA purposes based on the Commission's experience with using the Longley-Rice radio propagation prediction model for predicting service and interference for digital television (DTV). The parameters to be used in a computer implementation of the ILLR model for STELA purposes are mostly the same as were used for DTV service and interference analysis purposes, with only a few exceptions, stemming from their somewhat different objectives. Specific parameter values for the ILLR model are given in Table 1 and the text below:

Table 1.
Parameter Values for ILLR Implementation of the Longley-Rice Fortran Code

Parameter	Explanation	Value	Units
EPS	Relative Ground Permittivity	15.0	(none)
SGM	Ground Conductivity	0.005	Siemens/meter
ZSYS	(Coordinated with EN0)	0.0	(none)
EN0	Surface refractivity	301.0	N-units
IPOL	Polarization	0	(horizontal)
MDVAR	Calculation Mode	1	(Individual Mode)
KLIM	Climate Code	5	(Continental Temperate)
XI	Terrain sampling interval	0.1	Kilometers
HG(1)	Transmit antenna height above ground	See note	Meters
HG(2)	Receive antenna height above ground	6 or 9	Meters

Note 1. HG(1) in Table 1 is the height of the radiation center above ground. It is determined by subtracting the ground elevation above mean sea level (AMSL) at the transmitter location from the height of the radiation center AMSL. The latter value is contained in the FCC's CDBS, and may be found by query at http://www.fcc.gov/mb/video/tvq.html. The former is retrieved from the terrain elevation data base as a function of the transmitter site coordinates also found in CDBS. Linear interpolation between the surrounding data points in the terrain database is used to determine the ground elevation. Care should be used to ensure that consistent horizontal and vertical datums are employed among all data sets.

Note 2. HG(2) is 6 m or 9 m. Use 6 m for a one-story building, otherwise use 9 m.

Following are the parameters that describe the unique features of the ILLR prediction procedure for STELA purposes (these distinguish the ILLR model from the use of Longley-Rice for digital television coverage and interference calculations as detailed in OET Bulletin No. 69):

- the time variability factor to be used is 90%, based on the fact that the ILLR field strength prediction is to be compared with a required field strength (the noise-limited field intensity defined in Section 73.622(e) of the FCC rules);

- the confidence variability factor to be used is 50%, indicating median situations;[7]

- receiving antenna height is to be assumed to be 6 m (20 feet) above ground for one-story buildings and 9 m (30 feet) above ground for buildings taller than one-story;

[7] When point-to-point mode is used, as in ILLR, there are well-defined paths with fixed terminals, so there is no location variability. There is still a "confidence" or "situational" variability factor, which is taken here to be 50%.

• in those cases that error code 3 occurs (KWX = 3), the predicted field strength is nevertheless to be accepted as indicative of whether the noise-limited field strength is available at that location;

• consideration of the land use and land cover (*e.g.,* vegetation and buildings) in the vicinity of the receiving location is to be included through use of a lookup table of clutter losses additional to those inherent in the basic Longley-Rice v1.2.2 model. The lookup table must be constructed from information on the Land Use and Land Cover categories defined by the United States Geological Survey. See Section IV below.

D. Acquiring Terrain Elevation Data

Terrain elevation data for the United States is available from the United States Geological Survey (USGS) in the form of elevations relative to mean sea level at grid points separated by 3 arc-seconds (roughly every 100 feet at mid-latitudes of the U.S.). The Web site for obtaining these data directly from the USGS is http://edc.usgs.gov/geodata/. The Commission currently uses digital elevation model (DEM) data taken from 1:250,000 scale maps. The data are also available from several commercial sources. Installation of the ILLR program necessarily entails a computer coding task to link the terrain elevation data to the propagation prediction code. Computer program code must be developed to retrieve data representing the elevations of points along the path from the network affiliate's transmitter to the individual reception point of interest. To determine the elevation of a point at particular geographic coordinates along the path, the elevation of points at each corner of the 3-arc-second grid surrounding that point should be retrieved. The elevation of that point is then calculated by 4-point linear interpolation.

E. Acquiring TV Engineering Data

Engineering data for DTV stations in the U.S. (including digital Class A, Low Power, and TV Translator stations) is available from the FCC. Data for individual stations can be found at http://www.fcc.gov/mb/video/tvq.html, and consolidated data for all authorized stations can be found at ftp://ftp.fcc.gov/pub/Bureaus/MB/Databases/cdbs/. Where more than one authorization exists for a particular station, the record associated with the facility actually operating shall be used. Calculation of effective radiated power (ERP) in the direction of the individual location under study is accomplished using the relevant antenna azimuth and elevation patterns (including beam tilt, if any) at the relevant depression angle. Where specific elevation pattern data are not provided in the engineering data, a generic elevation pattern may be used as described generally in OET Bulletin No. 69.

III. Land Use and Land Cover (LULC) Clutter Losses

A. Clutter Losses

The presence of foliage and man-made structures in the radio path tends to reduce the strength of received signals. The Department of Commerce Longley-Rice code was developed from field strength measurements in areas selected for the purpose of investigating effects of terrain elevation profiles, not morphology. Thus, the ILLR computer program defined in this bulletin accounts for additional factors, especially buildings and vegetation, as so-called "clutter losses." The clutter loss, if any, at an individual reception location is determined by reference to the Land Use and Land Cover (LULC) database of the USGS. This database is entered with the geographic coordinates of the reception point to find the point's LULC classification and, subsequently, to determine a clutter loss value from Table 3. Finally, the clutter loss is subtracted from the signal strength predicted by the basic propagation prediction code to determine

whether the location is served or unserved.

B. Source of LULC Classification Data

The LULC database is available for downloading at the USGS Web site http://edc.usgs.gov/geodata/. The FCC presently uses data from at the 1:250,000 scale. In the FCC's implementation of the ILLR program, the LULC classifications are stored in a rasterized fashion like that used for terrain elevations. That is, the classifications are stored as functions of the latitude and longitude coordinates of points of the Universal Transverse Mercator (UTM) system with 200 meters between grid points. The classification of the nearest grid point is then used as the classification of any particular latitude-longitude point.

C. LULC Categories of the ILLR Program

Since the LULC classifications of the USGS have a broader purpose and are not targeted for application to radio propagation analyses, we have regrouped these classifications into more appropriate categories for use in the ILLR program. Table 2 defines this regrouping. For each computer run of the program, the appropriate ILLR clutter category number should be selected from Table 2 according to environmental conditions in the vicinity of the individual reception point. The clutter loss value, if any, is then determined as a function of the ILLR clutter category number and the channel number of the desired network television affiliate, by referring to Table 3.

Table 2.
Regrouping of LULC Categories for ILLR Applications

LULC Classification Number	LULC Classification Description	ILLR Clutter Category	ILLR Clutter Category Description
11	Residential	7	Residential
12	Commercial and Services	9	Commercial / Industrial
13	Industrial	9	Commercial / Industrial
14	Transportation, communications & utilities	1	Open land
15	Industrial and commercial complexes	9	Commercial / Industrial
16	Mixed urban and built-up lands	8	Mixed urban / buildings
17	Other urban and built-up land	8	Mixed urban / buildings
21	Cropland and pasture	2	Agricultural
22	Orchards, groves, vineyards, nurseries, and horticultural	2	Agricultural
23	Confined feeding operations	2	Agricultural
24	Other agricultural land	2	Agricultural
31	Herbaceous rangeland	3	Rangeland
32	Shrub and brush rangeland	3	Rangeland
33	Mixed rangeland	3	Rangeland
41	Deciduous forest land	5	Forest land
42	Evergreen forest land	5	Forest land
43	Mixed forest land	5	Forest land
51	Streams and canals	4	Water
52	Lakes	4	Water
53	Reservoirs	4	Water
54	Bays and estuaries	4	Water
61	Forested wetland	5	Forest land
62	Non-forest wetland	6	Wetland
71	Dry salt flats	1	Open land
72	Beaches	1	Open land
73	Sandy areas other than beaches	1	Open land
74	Bare exposed rock	1	Open land
75	Strip mines, quarries, and gravel pits	1	Open land
76	Transitional areas	1	Open land
77	Mixed Barren land	1	Open land
81	Shrub and brush tundra	1	Open land
82	Herbaceous tundra	1	Open land
83	Bare ground	1	Open land
84	Wet tundra	1	Open land
85	Mixed tundra	1	Open land
91	Perennial snowfields	10	Snow and Ice
92	Glaciers	10	Snow and Ice

This regrouping into 10 categories for use with the ILLR model was designed by EDX Engineering, Inc., now EDX Wireless, LLC, Eugene, Oregon.

Table 3.
Clutter Loss as a Function of ILLR LULC Clutter Category and TV Channel

		Clutter Loss, decibels (to be subtracted from calculated field strength)			
ILLR Clutter Category	**ILLR Clutter Category Description**	**Channels 2-6**	**Channels 7-13**	**Channels 14-36**	**Channels 38-69**
1	Open land	0	0	4	5
2	Agricultural	0	0	5	6
3	Rangeland	0	0	3	6
4	Water	0	0	0	0
5	Forest land	0	0	5	8
6	Wetland	0	0	0	0
7	Residential	0	0	5	7
8	Mixed Urban / Buildings	0	0	6	6
9	Commercial / Industrial	0	0	5	6
10	Snow and Ice	0	0	0	0

IV. Field Strength Calculation

The field strength of a network TV station at an individual location is predicted as follows:

1) Find the engineering facilities data for the network affiliate station of interest by, for example, consulting the TV Query FCC Web site at http://www.fcc.gov/mb/video/tvq.html. Necessary technical data include the station latitude and longitude, height above mean sea level of the antenna radiation center, and the effective radiated power (ERP) in the direction of the individual location under study.

2) Run Longley-Rice v1.2.2 in point-to-point mode with the parameters specified in Section II.C. above (Table 1 and the following text) to find the propagation path loss relative to free space propagation.

3) Find the USGS Land Use and Land Cover classification of the individual receiving location under study by consulting the LULC database, available from the USGS.

4) Convert the USGS Land Use and Land Cover classification to the corresponding ILLR clutter category using Table 2, and find the associated clutter loss from Table 3.

5) Calculate the ILLR field strength prediction from the formula

$$\text{Field} = (\text{Free Space Field}) - (\text{Longley-Rice 1.2.2 Path Loss}) - (\text{ILLR Clutter Loss})$$

where the Free Space Field in dB = $106.92 + 10\log_{10}(\text{ERP in kW}) - 20\log_{10}(\text{distance in km})$.

The field strength calculated in the last step determines whether the individual location is presumed to be served or unserved. The signal strength values for noise-limited service are 28 dBμV/m for TV channels 2-6; 36 dBμV/m for channels 7-13; and 41 dBμV/m (adjusted by a dipole factor equal to 20 log [615/(channel mid-frequency in MHz)] for channels 14 and above.

APPENDIX C

Further Initial Regulatory Flexibility Analysis

As required by the Regulatory Flexibility Act of 1980, as amended (RFA),[1] the Commission has prepared this present Further Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on small entities by the policies and rules proposed in the Further Notice of Proposed Rulemaking. (FNPRM). Written public comments are requested on this Further IRFA. Comments must be identified as responses to the Further IRFA and must be filed by the deadlines specified on the first page of this NPRM and FNPRM. The Commission will send a copy of this NPRM and FNPRM, including this IRFA, to the Chief Counsel for Advocacy of the Small Business Administration (SBA).[2] In addition, the NPRM and IRFA (or summaries thereof) will be published in the Federal Register.[3]

A. Need for and Objectives of the Proposed Rules. In the NPRM portion of this action, we seek comment on proposals for establishing a predictive model for determining the signal strength of digital television signals, including low power TV stations (Class A, LPTV and TV translator stations), at individual locations and for using that model to determine eligibility for delivery of distant network-affiliated television broadcast signals by direct broadcast satellite services. In addition, we seek comment on our proposal to continue to use the current standard for an outdoor antenna as specified in the DTV planning factors in predicting digital television signal strengths at individual. In the FNPRM discussion, we seek comment on two additional proposals relating to our proposed procedure for measurement of the strength of digital television signals at individual locations in ET Docket No 06-94. First, consistent with the new STELA provisions for eligibility, we propose to specify that a testing entity is to consider and test only the signals of those network affiliated stations that are located in the same DMA as the satellite subscriber. Second, we propose to specify the use of an outdoor antenna in measuring digital television signal strengths and, consistent with the change in the STELA to specifying an "antenna" rather than an "outdoor antenna," we also will consider comments and suggestions for solutions for situations where consumers are not able to use an outdoor antenna to receive local television signals. We indicate that such solutions could include options for measurement of signals indoors. This NPRM and FNPRM begins the process of implementing requirements of the Satellite Television Extension and Localism Act of 2010 (STELA).[4]

B. Legal Basis: The legal basis for the rule changes proposed in the NPRM and FNPRM is contained in Sections 1, 4(i) and (j), and 339 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154(i) and (j), and 339 (including amendments enacted in the Satellite Television Extension and Localism Act of 2010).

C. Description and Estimates of the Number of Small Entities to Which the Rules Adopted in this Notice may apply. The RFA directs agencies to provide a description of and, where feasible, an

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[1] *See* 5 U.S.C. § 603. The RFA, *see* 5 U.S.C. § 601-612, has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996, (SBREFA) Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

[2] *See* 5 U.S.C. § 603(a).

[3] *See* 5 U.S.C. § 603(a).

[4] *See* Satellite Television Extension and Localism Act of 2010, Title V of the "American Workers, State, and Business Relief Act of 2010," Pub. L. 111-175, 124 Stat. 1218 (2010) relating to copyright licensing and carriage of broadcast signals by satellite carriers, codified in scattered sections of 17 and 47 U.S.C.

estimate of the number of small entities that will be affected by the proposed rules.[5] The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."[6] In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.[7] A small business concern is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration (SBA).[8]

The proposed rules contained in this *Further NPRM* seek comment on and modify previous proposals to measure the strength of digital television signals at any particular location, as a means of determining whether any particular household is "unserved" by a local DTV network station and is therefore eligible to receive a distant DTV network signal retransmitted by a Direct Broadcast Satellite (DBS) service provider. Therefore, DBS providers will be directly and primarily affected by the proposed rules, if adopted. In addition, the proposed rules, if adopted, will also directly affect those local digital television stations that broadcast network programming. Therefore, in this Further IRFA, we consider, and invite comment on, the impact of the proposed rules on small digital television broadcast stations, small DBS providers, and other small entities. A description of such small entities, as well as an estimate of the number of such small entities, is provided below.

Nationwide, there are a total of approximately 29.6 million small businesses, according to the SBA.[9] A "small organization" is generally "any not-for-profit enterprise which is independently owned and operated and is not dominant in its field."[10] Nationwide, as of 2002, there were approximately 1.6 million small organizations.[11] The term "small governmental jurisdiction" is defined generally as "governments of cities, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand."[12] Census Bureau data for 2002 indicate that there were 87,525 local governmental jurisdictions in the United States.[13] We estimate that, of this total, 84,377 entities were "small governmental jurisdictions."[14] Thus, we estimate that most governmental jurisdictions are small.

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[5] 5 U.S.C. §§ 603(b) (3), 604(a) (3).

[6] *Id*., § 601(6).

[7] 5 U.S.C. § 601(3) (incorporating by reference the definition of "small business concern" in the Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such terms which are appropriate to the activities of the agency and publishes such definitions(s) in the Federal Register."

[8] 15 U.S.C. § 632.

[9] *See* SBA, Office of Advocacy, "Frequently Asked Questions," http://web.sba.gov/faqs/faqindex.cfm?areaID=24 (revised Sept. 2009).

[10] 5 U.S.C. § 601(4).

[11] Independent Sector, The New Nonprofit Almanac & Desk Reference (2002).

[12] 5 U.S.C. § 601(5).

[13] U.S. Census Bureau, Statistical Abstract of the United States: 2006, Section 8, page 272, Table 415.

[14] We assume that the villages, school districts, and special districts are small, and total 48,558. *See* U.S. Census Bureau, Statistical Abstract of the United States: 2006, section 8, page 273, Table 417. For 2002, (continued….)

Cable Television Distribution Services. The "Cable and Other Program Distribution" census category includes cable systems operators, closed circuit television services, direct broadcast satellite services, multipoint distribution systems, satellite master antenna systems, and subscription television services. Since 2007, these services have been defined within the broad economic census category of Wired Telecommunications Carriers; that category is defined as follows: "This industry comprises establishments primarily engaged in operating and/or providing access to transmission facilities and infrastructure that they own and/or lease for the transmission of voice, data, text, sound, and video using wired telecommunications networks. Transmission facilities may be based on a single technology or a combination of technologies. Establishments in this industry use the wired telecommunications network facilities that they operate to provide a variety of services, such as wired telephony services, including VoIP services; wired (cable) audio and video programming distribution; and wired broadband Internet services. By exception, establishments providing satellite television distribution services using facilities and infrastructure that they operate are included in this industry." The SBA has developed a small business size standard for this category, which is: All such firms having 1,500 or fewer employees. To gauge small business prevalence for these cable services the Commission must, however, use current census data that are based on the previous category of Cable and Other Program Distribution and its associated size standard; that size standard was: All such firms having $13.5 million or less in annual receipts. According to Census Bureau data for 2002, there were a total of 1,191 firms in this previous category that operated for the entire year. Of this total, 1,087 firms had annual receipts of under $10 million, and 43 firms had receipts of $10 million or more but less than $25 million. Thus, the majority of these firms can be considered small.

Direct Broadcast Satellite (DBS) Service. DBS service is a nationally distributed subscription service that delivers video and audio programming via satellite to a small parabolic "dish" antenna at the subscriber's location. Because DBS provides subscription services, DBS falls within the SBA-recognized definition of Wired Telecommunications Carriers. However, as discussed above, the Commission relies on the previous size standard, Cable and Other Subscription Programming, which provides that a small entity is one with $13.5 million or less in annual receipts. Currently, only two operators—DirecTV and EchoStar Communications Corporation (EchoStar)—hold licenses to provide DBS service, which requires a great investment of capital for operation. Both currently offer subscription services and report annual revenues that are in excess of the threshold for a small business. Because DBS service requires significant capital, the Commission believes it is unlikely that a small entity as defined by the SBA would have the financial wherewithal to become a DBS licensee. Nevertheless, given the absence of specific data on this point, the Commission acknowledges the possibility that there are entrants in this field that may not yet have generated $13.5 million in annual receipts, and therefore may be categorized as a small business, if independently owned and operated.

Television Broadcasting. The proposed rules and policies apply to television broadcast licensees and potential licensees of television service. The SBA defines a television broadcast station as a small business if such station has no more than $14 million in annual receipts.[15] Business concerns included in this industry are those "primarily engaged in broadcasting images together with sound."[16] The

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Census Bureau data indicate that the total number of county, municipal, and township governments nationwide was 38,967, of which 35,819 were small. *Id.*

[15] *See* 13 C.F.R. § 121.201, NAICS Code 515120.

[16] *Id*. This category description continues, "These establishments operate television broadcasting studios and facilities for the programming and transmission of programs to the public. These establishments also produce or transmit visual programming to affiliated broadcast television stations, which in turn broadcast the programs to the public on a predetermined schedule. Programming may originate in their own studios, from an affiliated network, or (continued….)

Commission has estimated the number of licensed commercial television stations to be 1,392.[17] According to Commission staff review of the BIA/Kelsey, MAPro Television Database ("BIA") as of April 7, 2010, about 1,015 of an estimated 1,380 commercial television stations[18] (or about 74 percent) have revenues of $14 million or less and thus qualify as small entities under the SBA definition. The Commission has estimated the number of licensed non-commercial educational (NCE) television stations to be 390.[19] We note, however, that, in assessing whether a business concern qualifies as small under the above definition, business (control) affiliations[20] must be included. Our estimate, therefore, likely overstates the number of small entities that might be affected by our action, because the revenue figure on which it is based does not include or aggregate revenues from affiliated companies. The Commission does not compile and otherwise does not have access to information on the revenue of NCE stations that would permit it to determine how many such stations would qualify as small entities.

In addition, an element of the definition of "small business" is that the entity not be dominant in its field of operation. We are unable at this time to define or quantify the criteria that would establish whether a specific television station is dominant in its field of operation. Accordingly, the estimates of small businesses to which rules may apply do not exclude any television station from the definition of a small business on this basis and are therefore over-inclusive to that extent. Also as noted, an additional element of the definition of "small business" is that the entity must be independently owned and operated. We note that it is difficult at times to assess these criteria in the context of media entities and our estimates of small businesses to which they apply may be over-inclusive to this extent.

Class A TV, LPTV, and TV translator stations. The rules and policies proposed in this Notice include licensees of Class A TV stations, low power television (LPTV) stations, and TV translator stations, as well as potential licensees in these television services. The same SBA definition that applies to television broadcast licensees would apply to these stations. The SBA defines a television broadcast station as a small business if such station has no more than $14 million in annual receipts.[21] Currently, there are approximately 537 licensed Class A stations, 2,386 licensed LPTV stations, and 4,359 licensed TV translators.[22] Given the nature of these services, we will presume that all of these licensees qualify as small entities under the SBA definition. We note, however, that under the SBA's definition, revenue of affiliates that are not LPTV stations should be aggregated with the LPTV station revenues in determining whether a concern is small. Our estimate may thus overstate the number of small entities since the revenue figure on which it is based does not include or aggregate revenues from non-LPTV affiliated companies. We do not have data on revenues of TV translator or TV booster stations, but virtually all of

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from external sources." Separate census categories pertain to businesses primarily engaged in producing programming. *See* Motion Picture and Video Production, NAICS code 512110; Motion Picture and Video Distribution, NAICS Code 512120; Teleproduction and Other Post-Production Services, NAICS Code 512191; and Other Motion Picture and Video Industries, NAICS Code 512199.

[17] *See* News Release, "Broadcast Station Totals as of December 31, 2009," 2010 WL 676084 (F.C.C.)(dated Feb. 26, 2010) ("*Broadcast Station Totals*"); also available at http://www.fcc.gov/mb/.

[18] We recognize that this total differs slightly from that contained in *Broadcast Station Totals*, *supra* note 446; however, we are using BIA's estimate for purposes of this revenue comparison.

[19] *See Broadcast Station Totals*, *supra* note 239.

[20] "[Business concerns] are affiliates of each other when one concern controls or has the power to control the other or a third party or parties controls or has the power to control both." 13 C.F.R. § 121.103(a)(1).

[21] *See* 13 C.F.R. § 121.201, NAICS Code 515120.

[22] *See Broadcast Station Totals*, *supra* note 239.

these entities are also likely to have revenues of less than $14 million and thus may be categorized as small, except to the extent that revenues of affiliated non-translator or booster entities should be considered.

D. Description of Projected Reporting, Recordkeeping and Other Compliance Requirement for Small Entities. The rules proposed in this Further *Notice* would modify previously proposed rules for measuring digital television signal strength at any specific location. These measurement procedures would be used as a means of determining whether households are eligible to receive distant DTV network signals retransmitted by DBS providers. Section 339(a)(2)(D)(vi) of the Communications Act (47 U.S.C. § 339(a)(2)(D)(vi)) delineates when measurements are necessary and when the satellite communications provider, the digital television broadcast station, or the consumer is responsible for bearing their cost. No reporting requirement is proposed. In this Further IFRA, we seek comment on the types of burdens direct broadcast satellite service providers and digital television broadcast stations will face in complying with the proposed requirements. Entities, especially small businesses and, more generally, small entities are encouraged to quantify the costs and benefits of the proposed reporting requirements.

E. Steps Taken to Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered. The RFA requires an agency to describe any significant alternatives that it has considered in reaching its proposed approach, which may include the following four alternatives (among others): (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.[23]

The Further Notice examines only two issues related to our previous proposals regarding DTV signal measurement procedures. As noted in the text, the proposal related to which stations need to be tested would reduce burdens both on businesses that conduct tests and on consumers. This is because the STELA limits the broad universe of stations that need to be tested to only a handful that are located in the same market at the satellite subscriber. This could reduce the amount and complexity of the equipment necessary to conduct a test as well as reduce the complexity of actually conducting the test as fewer stations need to be measured. This should have an accompanying cost savings to consumers as the tests should be less complex. We seek comment on this tentative conclusion especially from small entities.

F. Federal Rules that Might Duplicate, Overlap, or Conflict with the Proposed Rules. None.

[23] 5 U.S.C. § 603(c).