



Identifying and Analyzing Post Freeze LPTV/translator Interference

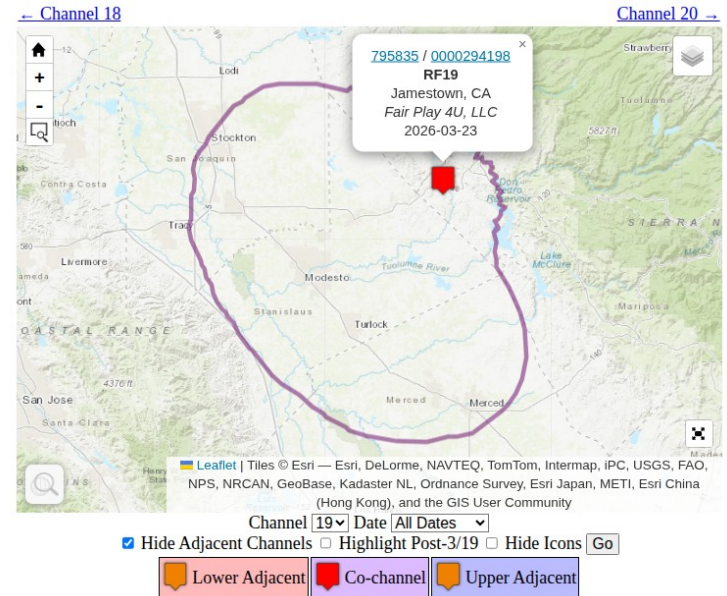
Doug Lung
dlung@transmitter.com

Post-Freeze LPTV/translator applications

- 2,524 applications filed as of April 24, 2026
- Search for applications using FCC LMS Application Search.
- Rabbitears.info “freeze lift tools” are much easier to use. Lists show city, state, channel #, and more. Use map tool to identify potential interference sources.
- Co-channel applications are the primary concern unless applicant is very close to a site receiving a weak adjacent channel station.

The screenshot shows the FCC Licensing and Management System Application Search interface. The form includes fields for Call Sign, File Number, FRN, and Facility ID. The Submitted Date Range is set from 03/19/2026 to 04/25/2026. The Status is set to Select Status. The Purpose includes checkboxes for New CP, Major Change of Licensed Facility, and Major Mod of CP. The Service includes checkboxes for Digital TV Translator, Digital Class A, Digital TV Translator, Low Power Digital TV, Low Power Digital TV-LD, Low Power Distributed Transmission System, and TV Translator Distributed Transmission System. The Community State is set to Arizona. The Community City, Applicant Name, Frequency, and Channel fields are empty. The Search, Cancel, and Clear Form buttons are at the bottom.

Freeze Lift Channel Map for Channel 19



https://www.rabbitears.info/static.php?name=freeze_lift_tools

Potential Impact of Applications

- May cause interference to viewers around major population centers:
 - ♦ 0.5% de minimis interference can impact a large number of people.
 - ♦ The signal doesn't stop at the contour:
 - Viewers in rural areas often use towers and large antennas to receive distant stations.
 - FCC rules require LPTV/translator resolve any interference to a full service viewer even outside its protect contour.
 - FCC rules do not require that LPTV/translator licensees protect other LPTV/translator viewers if interference below de minimis level (2%).
 - Class A stations are not required to protect full service or LPTV/translator viewers if interference is below de minimis level (0.5% / 2.0% respectively).
- Interference to translators outside the protected contour:
 - ♦ LPTV/translator stations will be displaced if they cause interference to translator input.
- Interference to cable TV head end facilities:
 - ♦ New LPTV/translator stations must protect head end facilities.

Analyze interference potential now to be prepared if applications are granted

TVStudy Can Hide Interference

- Default TVStudy parameters “assume service” if the Longley-Rice propagation model generates an error code – “Free parking”.
 - ♦ In a cell with a Longley-Rice error, two signals arriving at the same amplitude are both assumed to have service and no interference is counted.
 - ♦ Errors can be generated in areas with rapid terrain changes.
 - ♦ Terrain profile interval has an impact on the generation of errors.
- TVStudy’s Longley-Rice model has limitations, especially on paths with diffraction.
- Interference beyond the FCC service contour is not calculated.
 - ♦ LPTV/Class A UHF service contour is 51 dB μ V/m before dipole-factor correction.
 - ♦ Full service UHF contour is 41 dB μ V/m before dipole-factor correction.
- Applicants may have used the wrong parameters in the TVStudy interference analysis.
 - ♦ Does the channel, ERP, and antenna pattern match that on the application?
 - ♦ Does the transmitter location match that on the application?

TVStudy parameters must be changed to reveal all potential interference!

Finding likely interference in TVStudy – Step 1

- Locate the LPTV application by search on its facility ID number.
- Run a standard TV Interference check.
 - ◆ Recommend using 0.5 km cell size and 0.5 km terrain profile spacing
- Rename the tvixstudy.txt file if you want to save results before changing the study.

Live TV Player

Build TV Interference Check Study Ctrl-1

Record Window Help

Select proposal TV station record

1 records

Type	Call Si...	Channel	Svc	Status	City	State	Cntry	Facility ID	File Number	Date
LMS		D19 503 MHz	LD	APP *P	Jamestown	CA	US	795835	BLANK0000294198	2026-03-23

Search Record Type
TV Baseline

Search Station Data
Most recent LMS

Call Sign
Facility ID
795835

Channel
Status
(any)

File Number

View Duplicate Export Save Delete Import New Clear Search

Study Build Settings

Replicate Channel(s)

Change Channel

Template
Interference Check

Station Data
LMS 2026-04-24

Study Name
NEW19-Jamestown-CA-BLANK0000294

Cell size, km
0.5

Profile inc, km
0.5

Protect records not on baseline channel

Protect baseline records from LPTV

Protect LPTV records from Class A

Include non-U.S. records

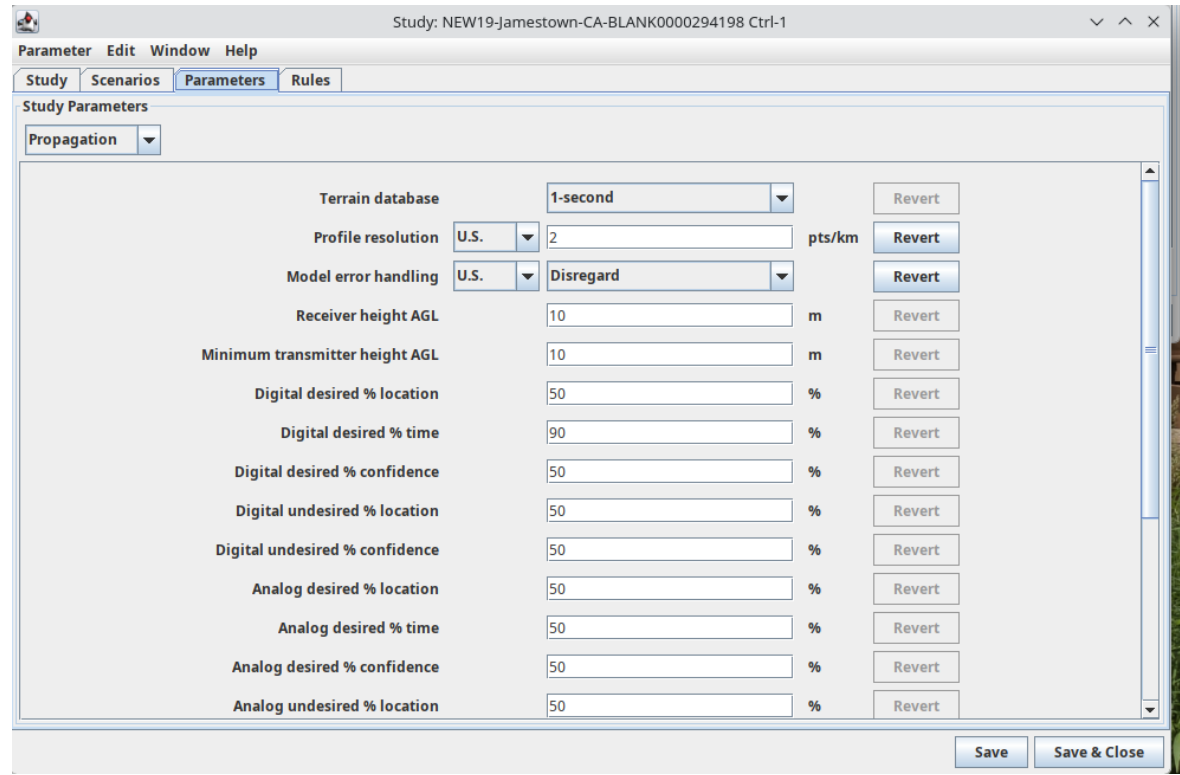
Output Settings
File: base
Map: base-no kml

Memor...
All

Cancel Build Build & Run

Finding likely interference in TVStudy – Step 2

- Open the completed study and make these modifications:
 - ♦ In “Parameters” > “Propagation” > “Model error handling” select “Disregard”.



Finding likely interference in TVStudy – Step 3

- In the “Scenarios” tab, locate the scenario or scenarios for the station or stations to analyze for interference beyond the FCC service contour.
- Locate the row with the station data for the “Desired” station in the scenario(s).
- Select row, right-click on it, and select “Allow editing” to open the station data window.

Scenario: NEW19-Jamestown-CA-BLANK0000294198/BLANK0000112998_LIC Ctrl-2

Station Edit Window Help

Scenario Name
BLANK0000112998_LIC

Scenario Description
Potential undesireds to KSTS D19 DT LIC SAN JOSE CA

12 stations

D...	Und	Call Sign	Channel	Svc	Status	City	State	Cntry	Facility ID	File Number	Date
<input checked="" type="checkbox"/>	<input type="checkbox"/>	KSTS	D19 503 ...	DT	LIC	SAN JOSE	CA	US	64987	BLANK0000112998	2020-05-01
<input type="checkbox"/>	<input checked="" type="checkbox"/>	KBBV-CD	D19 503 ...	DC	LIC	BAKERSFIELD	CA	US	69735	BLDTA20110930BHC	2011-09-30
<input type="checkbox"/>	<input checked="" type="checkbox"/>	KSEE	D20 509 ...	DT	LIC	FRESNO	CA	US	35594	BLANK0000191059	2022-05-19
<input type="checkbox"/>	<input checked="" type="checkbox"/>	KMPH-CD	D19 503 ...	DC	LIC	MERCED-MARIPOSA	CA	US	168338	BLANK0000063112	2018-10-26
<input type="checkbox"/>	<input checked="" type="checkbox"/>	KUVS-DT	D18 497 ...	DT	LIC	MODESTO	CA	US	58609	BLANK0000148149	2021-06-04
<input type="checkbox"/>	<input checked="" type="checkbox"/>	KMUM-CD	D19 503 ...	DC	LIC	SACRAMENTO	CA	US	18736	BLANK0000116698	2020-06-29
<input type="checkbox"/>	<input checked="" type="checkbox"/>	K20JX-D	D20 509 ...	DC	CP	SACRAMENTO	CA	US	334	BLANK0000280925	2025-11-18
<input type="checkbox"/>	<input checked="" type="checkbox"/>	K20JX-D	D20 509 ...	DC	LIC	SACRAMENTO	CA	US	334	BLDTA20101006AAS	2010-10-06
<input type="checkbox"/>	<input checked="" type="checkbox"/>	KDTV-DT	D20 509 ...	DT	LIC	SAN FRANCISCO	CA	US	33778	BLANK0000212320	2023-03-09
<input type="checkbox"/>	<input checked="" type="checkbox"/>	KCOY-TV	D19 503 ...	DT	LIC	SANTA MARIA	CA	US	63165	BLCDT20030604ACM	2003-06-04
<input type="checkbox"/>	<input checked="" type="checkbox"/>	KTVG-CD	D18 497 ...	DC	LIC	VISALIA	CA	US	68406	BLANK0000001548	2015-05-20
<input type="checkbox"/>	<input checked="" type="checkbox"/>	KRNS-CD	D18 497 ...	DC	LIC	RENO	NV	US	34577	BLANK0000063791	2018-11-28

(all Call Sign) (all Channel) (all Svc) (all State) (all Cntry) Clear

Add One Add Many... Remove Edit Close

Finding likely interference in TVStudy – Step 4

- In the station data, find the “Contour” setting and change it from “Default” to “FCC contour plus distance”.
 - ♦ Add sufficient distance to cover viewers outside the contour (i.e. 50 km).
- Save the modified station data (“OK”).

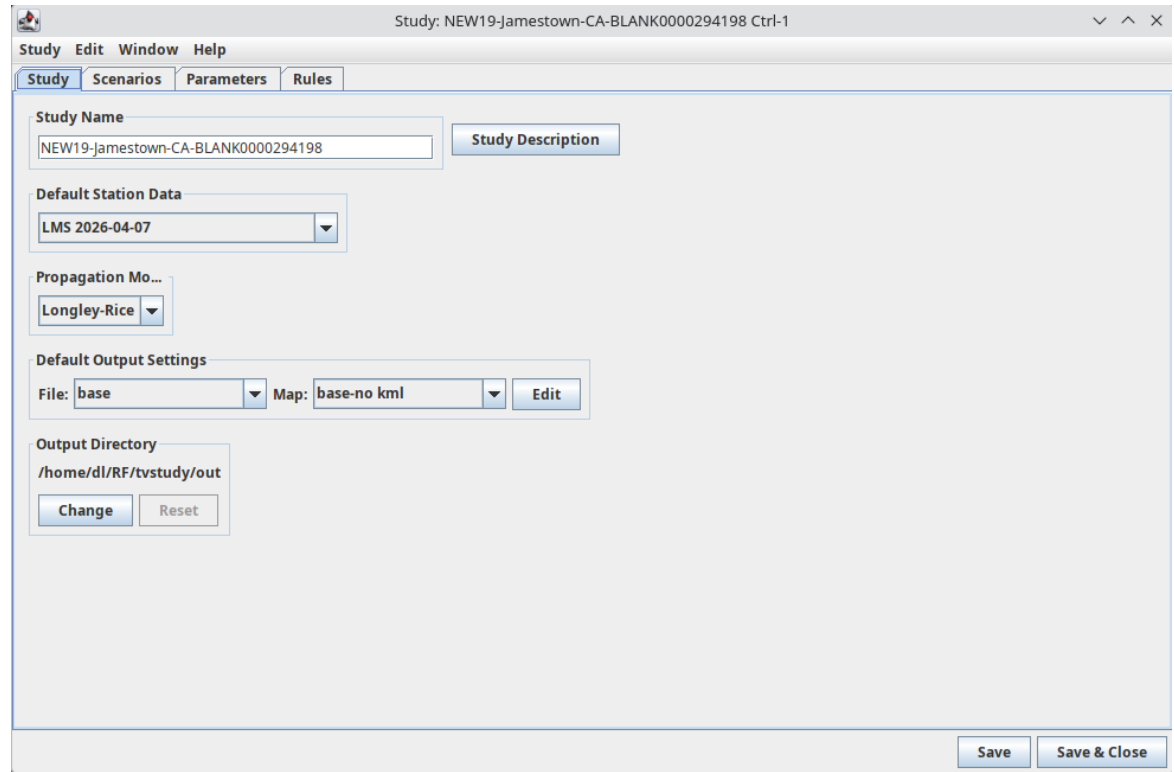
The screenshot shows the 'Station Data' window for station KSTS. The window title is 'Station Data: NEW19-Jamestown-CA-BLANK0000294198/BLANK0000112998_LIC/KSTS'. The window contains several sections for station information:

- Service:** TV digital
- Facility ID:** 64987
- Record ID:** LMS 2026-03-30 (deleted) 25076ff371c2ed580171ccfe110f2e
- Country:** U.S.
- Call Sign:** KSTS
- Channel:** 19 503 MHz
- Status:** LIC
- City:** SAN JOSE
- State:** CA
- File Number:** BLANK0000112998
- Zone:** II
- Freq. Offset:** (none)
- Emission Mask:** (n/a)
- Latitude (NAD83):** N 37° 29' 57.00"
- Longitude (NAD83):** W 121° 52' 20.00"
- Site Number:** 1
- Height AMS...:** 922.3
- HAAT, m:** 703.0
- Peak ERP, kW:** 500
- Azimuth Pattern:** Dielectric-TFU-17ETT/VP-R C170, Orient. 0.0, Baseline record
- Service Area:** FCC contour plus distance (selected), Mode Arg. km or % Cont. Level dBu: 50.00 (default)
- Geography:** (none) (selected), Edit button
- Elevation Pattern:** (none), Elec. Tilt: 1.00, Mech. Tilt: 0.00, Tilt Orient.: 0.0, May use generic pattern when needed

Buttons for 'Copy', 'Paste', 'Edit', 'Change...', 'Export', 'Cancel', and 'OK' are visible throughout the interface.

Finding likely interference in TVStudy – Step 5

- Modify “Default Output Settings” for data and maps as needed.
- Verify changes have been saved.
- Re-run the study.



The screenshot shows the TVStudy software interface. The window title is "Study: NEW19-Jamestown-CA-BLANK0000294198 Ctrl-1". The menu bar includes "Study", "Edit", "Window", and "Help". The "Study" tab is active, and the "Parameters" sub-tab is selected. The "Default Output Settings" section is highlighted, showing the following configuration:

- Study Name:** NEW19-Jamestown-CA-BLANK0000294198
- Default Station Data:** LMS 2026-04-07
- Propagation Mo...:** Longley-Rice
- Default Output Settings:** File: base, Map: base-no kml
- Output Directory:** /home/dl/RF/tvstudy/out

Buttons for "Study Description", "Edit", "Change", "Reset", "Save", and "Save & Close" are visible.

Analyzing TVStudy Results

- When the study has completed view results in the tvixstudy.txt file.
 - ♦ Before and after interference free coverage will be shown in the file.

Interference to KSTS LIC BLANK0000112998 scenario 1

**IX: 5.66% interference caused

	Call	Chan	Svc	Status	City, State	File Number	Distance
Desired:	KSTS	D19	DT	LIC	SAN JOSE, CA	BLANK0000112998	
Undesireds:		D19	LD	APP	Jamestown, CA	BLANK0000294198	120.4 km
	KUVS-DT	D18	DT	LIC	MODESTO, CA	BLANK0000148149	122.0
	KBBV-CD	D19	DC	LIC	BAKERSFIELD, CA	BLDTA20110930BHC	371.1
	KMPH-CD	D19	DC	LIC	MERCED-MARIPOSA, CA	BLANK0000063112	162.7
	KMUM-CD	D19	DC	LIC	SACRAMENTO, CA	BLANK0000116698	138.7
	KCOY-TV	D19	DT	LIC	SANTA MARIA, CA	BLCDT20030604ACM	325.0
	K20JX-D	D20	DC	CP	SACRAMENTO, CA	BLANK0000280925	125.5

Service area	Terrain-limited	IX-free, before	IX-free, after	Percent New IX
82173.9 11,308,104	39149.8	8,741,223 33884.0 7,549,562	32272.8 7,122,431	4.76 5.66

Undesired	Total IX	Unique IX, before	Unique IX, after
D19 LD APP	4135.2	696,686	1611.2 427,131

5.66% new interference! (4.05% with default TVStudy parameters)

Analyzing TVStudy Results (2)

- Class A LPTV stations may also be impacted by new applications.

Interference to KMPH-CD LIC BLANK0000063112 scenario 1

**IX: 27.97% interference caused

Desired:	Call	Chan	Svc	Status	City, State	File Number	Distance		
	KMPH-CD	D19	DC	LIC	MERCED-MARIPOSA, CA	BLANK0000063112			
Undesireds:		D19	LD	APP	Jamestown, CA	BLANK0000294198	57.9 km		
	KTVG-CD	D18	DC	LIC	VISALIA, CA	BLANK0000001548	109.5		
	KBBV-CD	D19	DC	LIC	BAKERSFIELD, CA	BLDTA20110930BHC	264.4		
	KMUM-CD	D19	DC	LIC	SACRAMENTO, CA	BLANK0000116698	182.0		
	KSTS	D19	DT	LIC	SAN JOSE, CA	BLANK0000112998	162.7		
	KCOY-TV	D19	DT	LIC	SANTA MARIA, CA	BLCDT20030604ACM	291.9		
	KSEE	D20	DT	LIC	FRESNO, CA	BLANK0000191059	73.9		
Service area		Terrain-limited		IX-free, before		IX-free, after		Percent New IX	
9765.9	321,972	5667.0	299,672	5497.6	298,229	5020.9	214,820	8.67	27.97
Undesired		Total IX		Unique IX, before		Unique IX, after			
D19	LD APP	485.3	83,409	476.6	83,409				

27.97% new interference!

Analyzing TVStudy Results (3)

- This Jamestown CA Channel 19 application even fails a default TVStudy check.
- The FCC should reject this application, but with thousands of applications filed, it is likely to take a long time to analyze them all.

Study cell size: 1.00 km

Profile point spacing: 1.00 km

Maximum new IX to full-service and Class A: 0.50%

Maximum new IX to LPTV: 2.00%

!!Possible MX, excessive masked interference caused in scenario 1

**IX check failure to KMPH-CD LIC BLANK0000063112 scenario 1, 27.54% interference caused

**IX check failure to KSTS LIC BLANK0000112998 scenario 1, 4.05% interference caused

**IX check failure to KSTS LIC BLANK0000112998 scenario 2, 4.05% interference caused

---- Below is IX received by proposal APP BLANK0000294198 ----

Proposal receives 4.02% interference from scenario 1

Proposal receives 4.02% interference from scenario 2

The applicant submitted TVStudy results showing a 0.370 kW facility on channel 29 passed the ix check, not the 8 kW facility on channel 19 shown in the application!

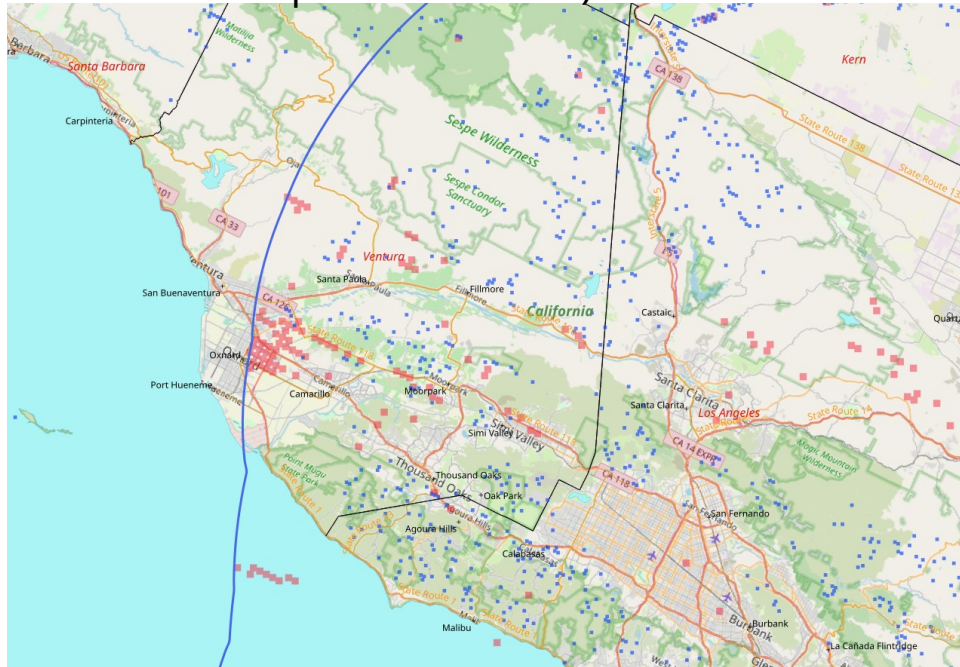
LPTV Application: Channel 36 Santa Paula

- This application (FID 794346) is co-channel to KNBC, Channel 36, Los Angeles.
- Study with default TVStudy parameters shows 0.78% unique interference to KNBC.
- Study with terrain profile interval at 0.1 km drops interference to 0.35% (*de minimis*).
- Unique interference to KNBC:
 - ♦ 0.1 km Terrain Profile Interval (TPI): 57,242 people (0.35%) **PASS**
 - ♦ 0.1 km Terrain Profile Interval, disregard model errors: 64,436 people (0.43%) **PASS**
 - ♦ Default TVStudy parameters: 126,465 people (0.78%) **FAIL**
 - ♦ Default TVStudy parameters except ignore model errors: 134,705 people (0.83%) **N/A**
 - ♦ KNBC true AZ-EL antenna pattern, extended contour, 0.5 km cell size, 0.5 km TPI. disregard model errors: 390,688 people (2.32%) **N/A**

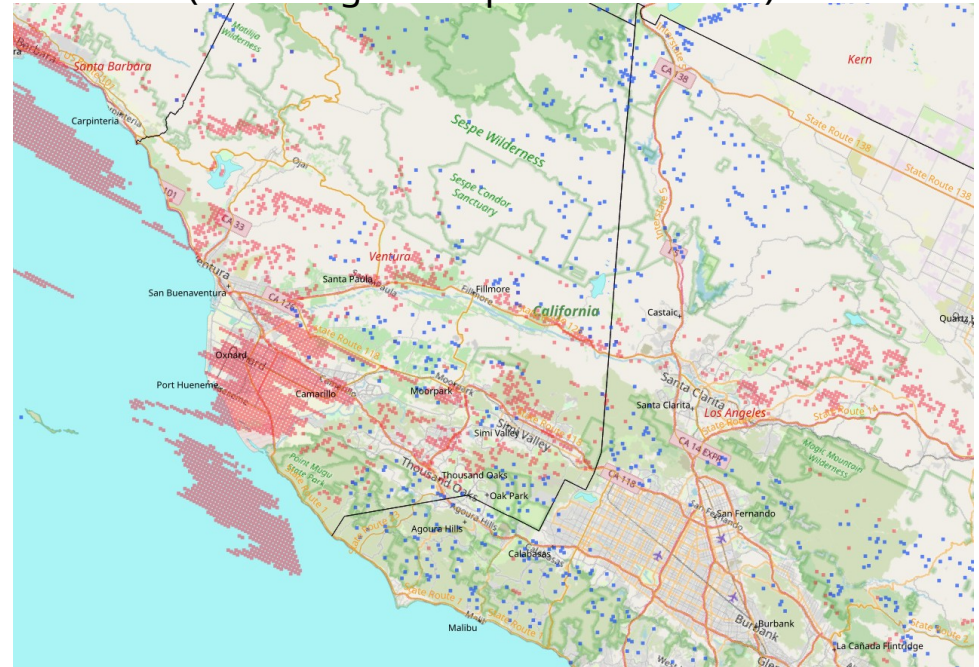
In spite of interference, this application should pass FCC analysis if specified 0.1 TPI is used

Mapping TVStudy Results (Interference to KNBC)

TVStudy interference per application parameters (KNBC FCC h-plane azimuth pattern, TVStudy defaults except for 0.1 km TPI)



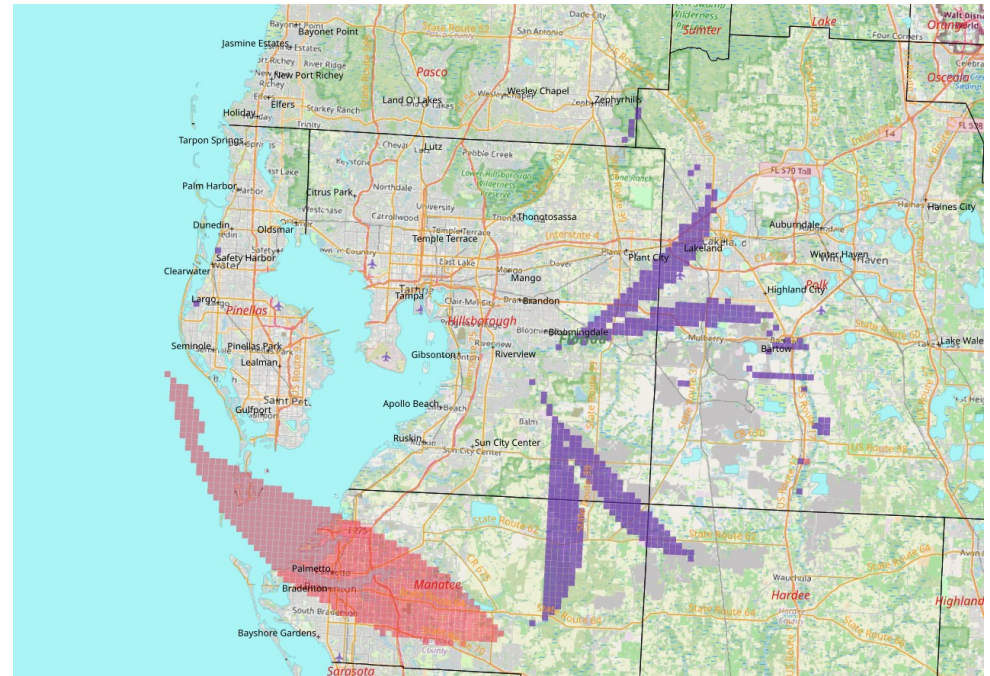
Study with KNBC Az-El pattern, 0.5 km cell size, 0.5 km TPI, disregard model errors, added 50 km to contour (no change in required threshold)



Applicant must resolve interfere issues with viewers & MVPDs regardless of location

LPTV Application: Channel 30 Myakka, FL

- This application (FID 796026) is co-channel to WRMD-CD, Channel 30, Tampa, FL.
- Study with default TVStudy parameters shows 6.49% unique interference to WRMD-CD.
- Study submitted with application (same parameters) says “No IX check failures found”.
- Only the results, not the complete tvixstudy.txt file, were attached to the application.
- Using a 0.1 km terrain profile interval did not significantly change the interference.
- How did the applicant get TVStudy to show “No IX check failures found” ?



This application should be rejected

Washington MD TV Study Failure

- Washington County MD and surrounding areas in West Virginia are outside Washington D.C. and Baltimore MD station contours and/or predicted Longley-Rice coverage.
- Diffraction over South Mountain provides excellent reception of these stations.
See <https://www.transmitter.com/tc2024/> for details on propagation in this case
- Applications were filed on multiple D.C. and Baltimore, MD TV stations' channels that will prevent viewers and cable head ends from receiving these stations.
- A small sample of applications expected to cause co-channel interference :
 - ◆ Channel 7 FID 794457 application with WJAL (Washington, D.C.)
 - ◆ Channel 11 FID 794382 application with WBAL (Baltimore, MD)
 - ◆ Channel 31 FID 794272 application with WETA (Washington, D.C.)
 - ◆ Channel 34 FID 794274 application with WRC-TV (Washington, D.C.)
 - A post-repack translator operating at the same location was displaced due to viewer interference to WRC-TV observed after it was constructed.

Similar situations likely exist elsewhere, affecting cable head ends and translator inputs

WRC-TV to Hagerstown, MD – Will it work?

Obstructed Path Field Strength Predictions – WRC-TV to HGR

Model	ITM 7.0 / Longley-Rice 1.22				ITWOM 3.0	P1812-4
Software	SPLAT!	SPLAT!	TVStudy	TVStudy	SPLAT!	RadioPlanner 2.1
Elevation data	ASTER	USGS	USGS	USGS	ASTER	USGS
Clutter data	None	None	None	NLCD 2006	None	OpenStreetMap
Path Loss (dB):						
Free Space	128.15	128.15			128.15	128
Terrain	80.59	71.07			25.08	46.1
Total	208.74	199.23			153.24	174.1
Field (dB μ V/m):	13.7	23.67	26.8	21.8	69.2	47.4
Path notes:	Double Horizon	Double Horizon			Double Horizon	
Dominant mode:	Troposcatter	Diffraction			Diffraction	
Model errors:	#3 (Out of range)	None			None	

- **Yes! Excellent error free reception with Televes Ellipse Mix antenna ~ 6.1 m (20') AGL**
- Models predicted significantly different signal levels
- Field strength not measured, but P.1812-4 appears closest based on CNR (24 to 26 dB) considering antenna gain and LNA
- More details in 1Q2024 IEEE Broadcast Technology:
<https://bts.ieee.org/publications/ieee-broadcast-technology.html>

In complex propagation environments, other propagation models work better than TVStudy

LPTV Interference: FCC Rules (1)

§ 74.703 Interference

(a) An application for a new low power TV or TV translator station or for a change in the facilities of such an authorized station will not be granted when it is apparent that interference will be caused. Except where there is a written agreement between the affected parties to accept interference, or where it can be shown that interference will not occur due to terrain shielding and/or Longley-Rice terrain dependent propagation methods, the licensee of a new low power TV or TV translator station shall protect existing low power TV and TV translator stations from interference within the protected contour defined in § 74.792 and shall protect existing Class A TV stations within the protected contours defined in § 73.6010 of this chapter. Such written agreement shall accompany the application. Copies of OET Bulletin No. 69 are available for inspection through the Federal Communications Commission's Reference Information Center. This document is also available on the FCC homepage at <https://www.fcc.gov/oet/info/documents/bulletins/#69>.

LPTV Interference: FCC Rules (2)

§ 74.703 Interference

(b) It shall be the responsibility of the licensee of a low power TV or TV translator station to correct at its expense any condition of interference to the direct reception of the signal of any full-power TV broadcast station operating on the same channel as that used by the low power TV or TV translator station or an adjacent channel which occurs as a result of the operation of the low power TV or TV translator station. *Interference will be considered to occur whenever reception of a regularly used signal is impaired by the signals radiated by the low power TV or TV translator station, regardless of the quality of the reception or the strength of the signal so used. If the interference cannot be promptly eliminated by the application of suitable techniques, operation of the offending low power TV or TV translator station shall be suspended and shall not be resumed until the interference has been eliminated.* If the complainant refuses to permit the low power TV or TV translator station to apply remedial techniques that demonstrably will eliminate the interference without impairment of the original reception, the licensee of the low power TV or TV translator station is absolved of further responsibility. [Emphasis added]

Identify and correct (if possible) interference before the new LPTV/translator is built

LPTV Interference: FCC Rules (3)

§ 74.703 Interference

(d) When a low-power TV or TV translator station causes interference to a CATV system by radiations within its assigned channel at the cable headend or on the output channel of any system converter located at a receiver, the earlier user, whether cable system or low-power TV or TV translator station, will be given priority on the channel, and *the later user will be responsible for correction of the interference*. When a low-power TV or TV translator station causes interference to a BRS or EBS system by radiations within its assigned channel on the output channel of any system converter located at a receiver, the earlier user, whether BRS system or low-power TV or TV translator station, will be given priority on the channel, and the later user will be responsible for correction of the interference. [Emphasis added]

- Section 74.703 rules do not specifically require protection of translator input channels, but the FCC 25-84 Report and Order states “we add as a basis for displacement interference caused by an LPTV/TV translator station to a TV translator input channel.”

Identify threats early to cable head ends receiving full power, translator, or LPTV signals

Post-Freeze Interference – Summary

- Thousands of applications have been filed for new LPTV and translator stations since the FCC lifted the freeze.
- A sample of applications reviewed shows major errors in interference calculation. These should be rejected by the FCC.
- Other applications checked pass the TVStudy Interference Check, but are likely to cause interference to viewers.
 - ♦ For stations in large markets, 0.5% or 2% “de minimis” interference can impact entire communities.
 - ♦ Viewers outside the FCC protected contour are not considered in TVStudy FCC interference checks.
 - ♦ Interference to cable head ends and translator inputs is not considered in TVStudy.
- Interference to viewers of full power stations must be resolved, but this can take time.
- New LPTV interference to cable head ends or translator inputs should take less time, but must be recognized first.

Advice to new & existing stations – Do a thorough interference check! Be Prepared!

Additional Resources

- Slides from this presentation will be posted at:
<https://www.transmitter.com/nta2026>
- Tips on using TVStudy and Mapping Results with sample files:
<https://transmitter.com/QGIS/>
- Rabbitears.info post-freeze tools:
https://www.rabbitears.info/static.php?name=freeze_lift_tools

Questions & comments welcome – email me at dlung@transmitter.com
