

Propagation Map Validation Report SR76&711 Tower

Prepared for

Martin County

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Prepared by:

4G Unwired

A Division of the Foresite Group

www.4GUnwired.com

Executive Summary

4G Unwired was hired to analyze the coverage maps provided by Vertex Development, LLC for the SR76&711 Tower request submitted to Martin County. The SR76&711 is a proposed Monopine tower with up to 4 wireless carriers, with AT&T as the initial anchor tenant.

The proposed SR76/711 monopine tower provides **clear, measurable coverage improvements** to the surrounding area compared with the existing AT&T network configuration. Independent propagation modeling performed by 4G Unwired confirms AT&T's submitted coverage maps and validates that the proposed site meaningfully enhances voice-grade LTE service.

Using industry-standard modeling (Atoll Aster, Band 2), 4G Unwired validated that the addition of the new tower closes existing service gaps and strengthens coverage continuity across the SR76/711 corridor.

Within the 3-mile focus zone around FP68, the new site delivers a **5.6% increase in Good coverage** and a **3.0% increase in Usable coverage** for PCS Band 2 VoLTE service—reinforcing that the tower materially improves service quality and reliability for users in this portion of Martin County.

Existing surrounding towers (SFORK, FP09, Khighway) leave coverage gaps due to terrain, clutter, and separation; the proposed location is well-positioned to address these deficiencies.

Overall, the engineering evidence supports that the proposed tower is beneficial, well-justified, and aligned with industry best practices for improving network performance in underserved areas.

1. Documents Provided

Martin County provided the [2025_0905_K049-004_RESUB.pdf](#), via email on 10/20/2025.

Summary:

Pages	Description
1-13	Cover Sheets
14-17	Development Review Application
18-31	Design Submittal
32-36	ASCE Hazards Report
37-41	Determination of No Hazard to Air Navigation
42	Letter from AT&T RF Engineer
43	AT&T VoLTE Coverage Plot of existing network (4 surrounding sites) (Band 2)
44	AT&T Coverage Plot of above sites with new proposed site
45	Updated RF information useful for propagation modeling
46-54	Blueprints and Surveys

2. Existing Structures

The list of Antenna Structure Registration (ASR) within the county has been compiled using the FCC ASR Search. From the PDF received, we identified the dots that we could not find in the list of ASR from the FCC database: The three adjacent sites from the AT&T coverage maps were identified and confirmed as Constructed in the ASR and are visible in Google Earth.

Table 1: FCC ASR Locations near Proposed SR76&711 Proposed Tower

ATT_Name	Site_Type	ASR_NUM	Longitude	Latitude	Altitude (ft)	Support Height (ft)	Status
FSL01110 (FP09)	ASR	1002219	-80.311639	27.10525	19.69	197	Constructed
FSL00980 (SFORK)	ASR	1018574	-80.264944	27.11356	0	300	Constructed
FSL00994 (Khighway)	ASR	1061056	-80.327389	27.07281	22.97	250	Constructed
FSL00885 (FP68)	ASR	1322956	-80.279389	27.08761	16.4	120	Granted

AT&T Mobile provided additional information on the current RF configuration of the LTE sites/antennas in the area, which can be incorporated into our coverage review. This includes the number of sectors, the antenna height, the antenna orientation on the towers, the specific antenna model used, which also indicates the frequency band and the electrical Downtilt, the amount of any mechanical antenna Downtilt, the power level, and the MIMO configuration.

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Table 2: AT&T Mobile provided Site Information

Sitename, transmitter reference	Antenna Centerline Height (ft)	Antenna Azimuth	Antenna model	Antenna tilt (Mechanical). EDT seen as sufix in antenna model	PA Power (dBm)	Number of MIMO Tx ports
FSL00885_9A_1_LTP	115	280	80010692V01_1950MHz_03DT	0	46.3	4T4R
FSL00885_9B_1_LTP	115	80	80010692V01_1950MHz_03DT	0	46.3	4T4R
FSL00885_9C_1_LTP	115	175	80010692V01_1950MHz_03DT	0	46.3	4T4R
FSL00980_9A_1	228	310	SBNHH-1D85B_1950MHz_05DT	0	46.6	4T4R
FSL02980_9B_1	228	70	SBNHH-1D85B_1950MHz_08DT	0	46.6	4T4R
FSL00980_9C_1	228	180	SBNHH-1D85B_1950MHz_04DT	0	46.6	4T4R
FSL02994_9B_1	249	105	840370966_1950MHz_02.5DT	0	45.4	4T4R
FSL04994_9C_1	249	225	SBNHH-1D85C_1950MHz_00DT	0	45.4	4T4R
FSL00994_9A_1	249	345	800372965_1950MHz_02DT	0	45.4	4T4R
FSL00983_9A_1	199	335	SBNHH-1D85B_1950MHz_05DT	0	46.6	4T4R
FSL02983_9B_1	199	120	SBNHH-1D85B_1950MHz_04DT	0	47.1	4T4R
FSL04983_9C_1	199	225	SBNHH-1D85B_1950MHz_02DT	0	46.6	4T4R
FSL01110_9A_1	187	350	80010764_1950MHz_07DT	0	47.4	4T4R
FSL01110_9B_1	187	120	80010764_1950MHz_07DT	0	47.4	4T4R
FSL01110_9C_1	187	260	80010764_1950MHz_07DT	0	47.4	4T4R

The ASR locations were imported into Atoll and a map below shows their locations with respect to 1 to 5 mile buffers around the proposed tower. The closest tower is ASR 10448764, owned by School Board of Martin County, Florida and is 1.5 miles to the east of the target location.

Figure 1: ASR and towers around the SR76&711 Proposed Tower



3. Frequency Bands for the study

The updated AT&T Mobile data indicated that PCS/Band 02 was the reference band in their provided propagation map study.

Table 3: AT&T Frequency Band Reference in Martin County, FL

Band	Duplex Type	Downlink Frequencies (MHz)	Uplink Frequencies (MHz)
Band 2	FDD	1930-1990	1850-1910

AT&T has many licensed frequency bands to provide commercial mobile service in Martin County, Florida. They can be used to provide LTE/5G services, such as Voice and Mobile Broadband. Lower frequencies typically have better propagation characteristics than higher frequencies due to fundamental physics. Each band would have different coverage footprints due to propagation characteristics, antenna differences, power levels, etc.

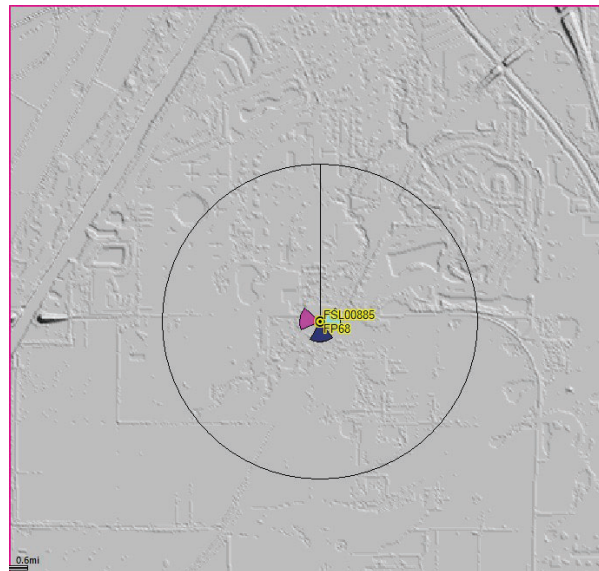
4. Coverage Maps

The coverage maps provided by AT&T Mobile appeared to represent the Band 02 Voice over LTE (VoLTE) RSRP coverage footprints. VoLTE does not require a lot of bandwidth and requires less coverage potential than broadband coverage, say 5 Mbps download service level.

The provided RSRP thresholds for the VoLTE service are -95 dBm for good outdoor coverage, -115 dBm for usable outdoor coverage, and -140 dBm for marginal coverage. These seem to be reasonable thresholds for VoLTE service, though for the marginal coverage band in our predictions, we will use -130 dBm as a threshold to provide more clearance from the RF noise floor.

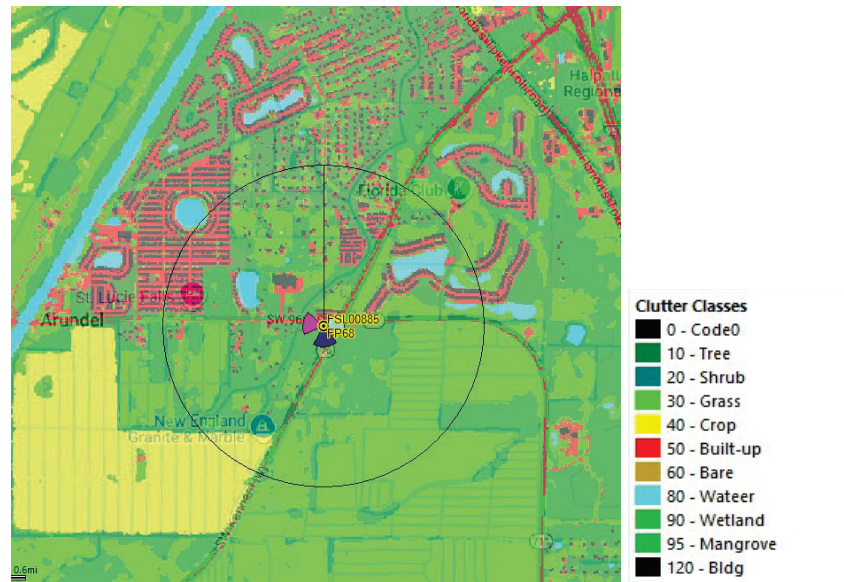
Terrain data was extracted from the USGS dataset at a 10-meter resolution for Martin County, Florida. This is an appropriate resolution for RF modelling in a developed suburban environment. This terrain data will provide propagation model inputs for obstruction.

Figure 2: 10-meter Terrain DEM for the area



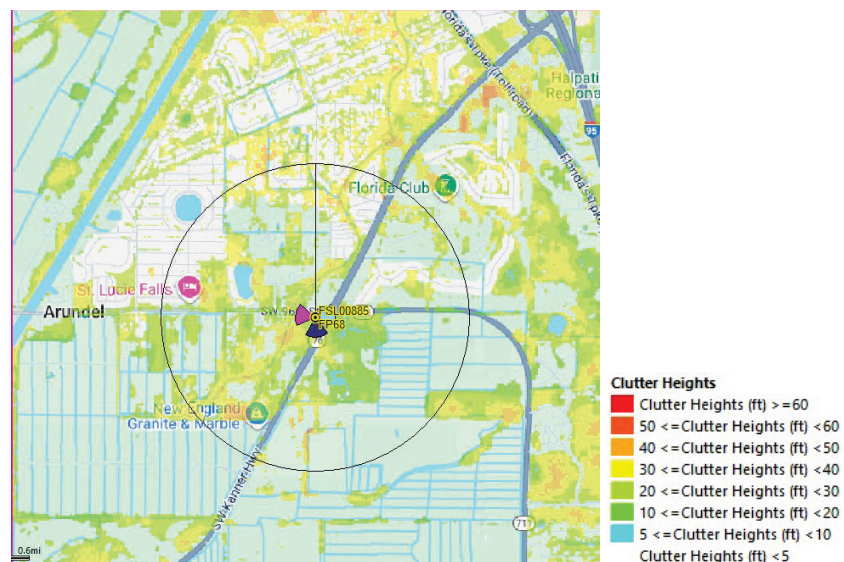
Clutter or Land Area Type of information is designated as Clutter Class data in Atoll and a 10-meter resolution dataset was acquired for Martin County, Florida. This dataset classifies each 10-meter pixel as a different type of area type which impacts the Aster propagation model signal level calculation.

Figure 3: 10-meter Clutter Classification Overlay



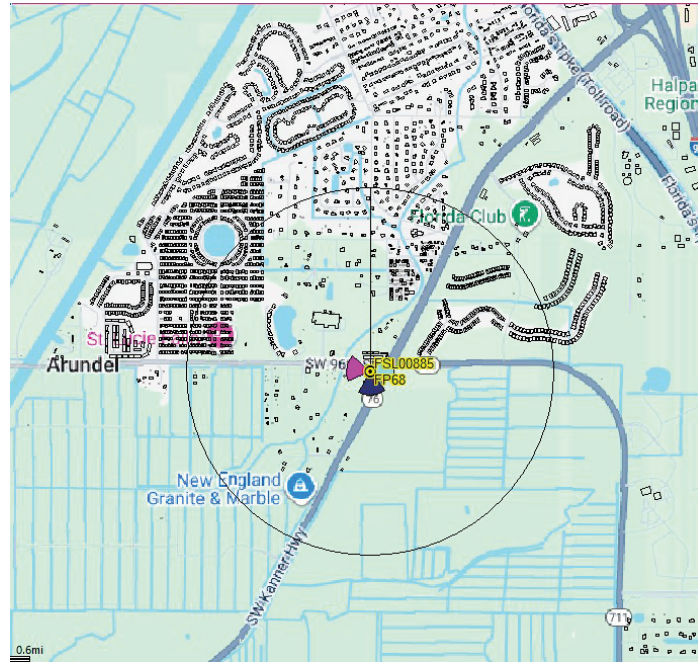
Another input in the Atoll RF Planning tool is the Clutter Height dataset. A 10-meter-resolution clutter-height raster depicting the heights of trees/foliage/obstructions was also imported to reflect the real-world obstructions in the area better.

Figure 4: 10-meter Canopy Height Overlay



Another dataset included in the coverage modelling was a building database (with heights) for Martin County, Florida. This vector data overlays the previously mentioned clutter height data to more fully account for RF obstructions in the area.

Figure 5: Building Database Overlay



The Atoll Aster Propagation Model was used for prediction, which uses loaded terrain, clutter class, clutter height, building data, site information, frequency band, and transmit powers to generate accurate coverage predictions.

Figure 6: Band 02 LTE VoLTE Coverage from Existing Adjacent AT&T Sites

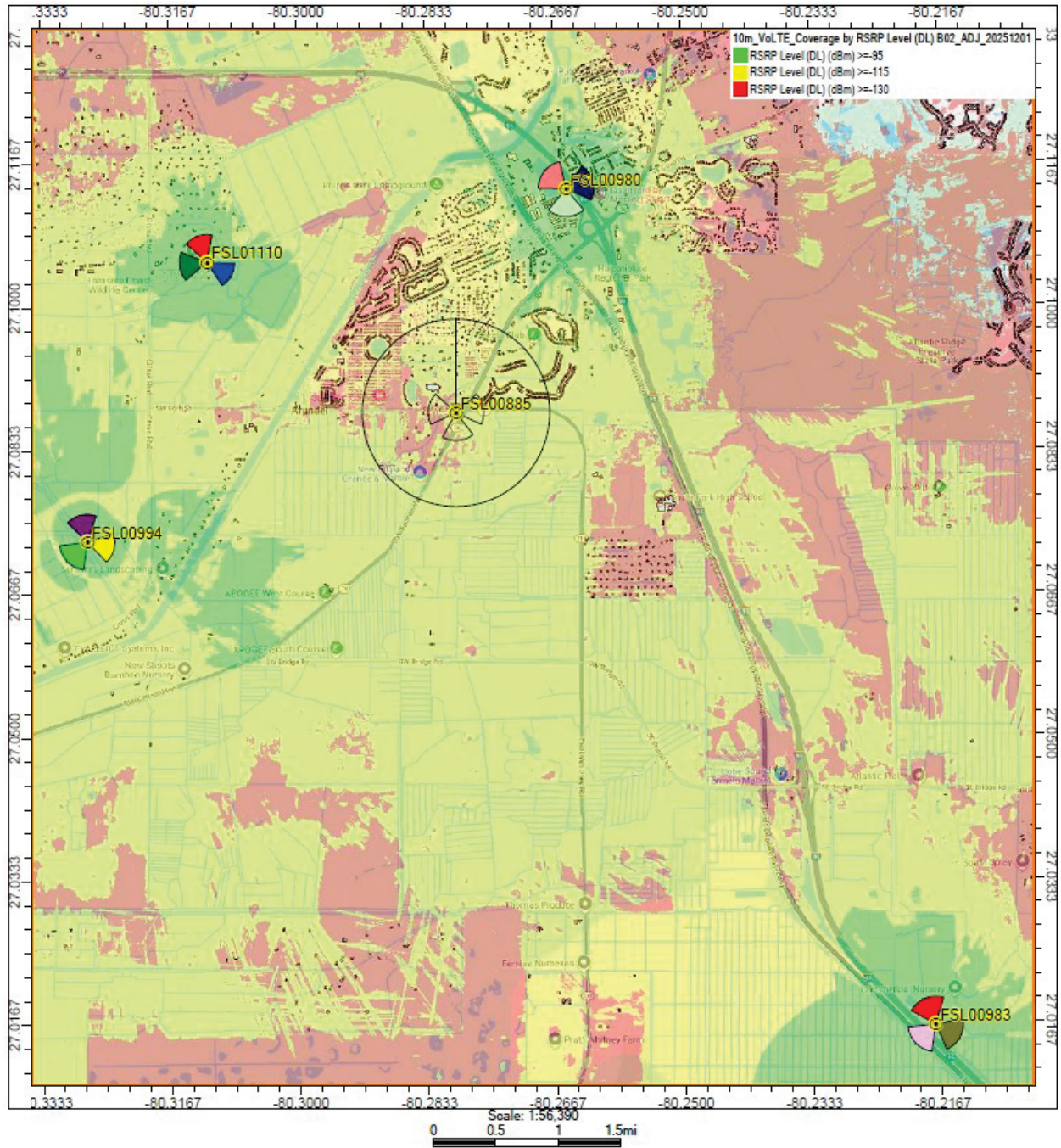


Figure 7: Provided Coverage Map with Existing AT&T Sites with good, usable, and marginal VoLTE coverage (2025_0905_K049-004_RESUB.pdf, page 43)

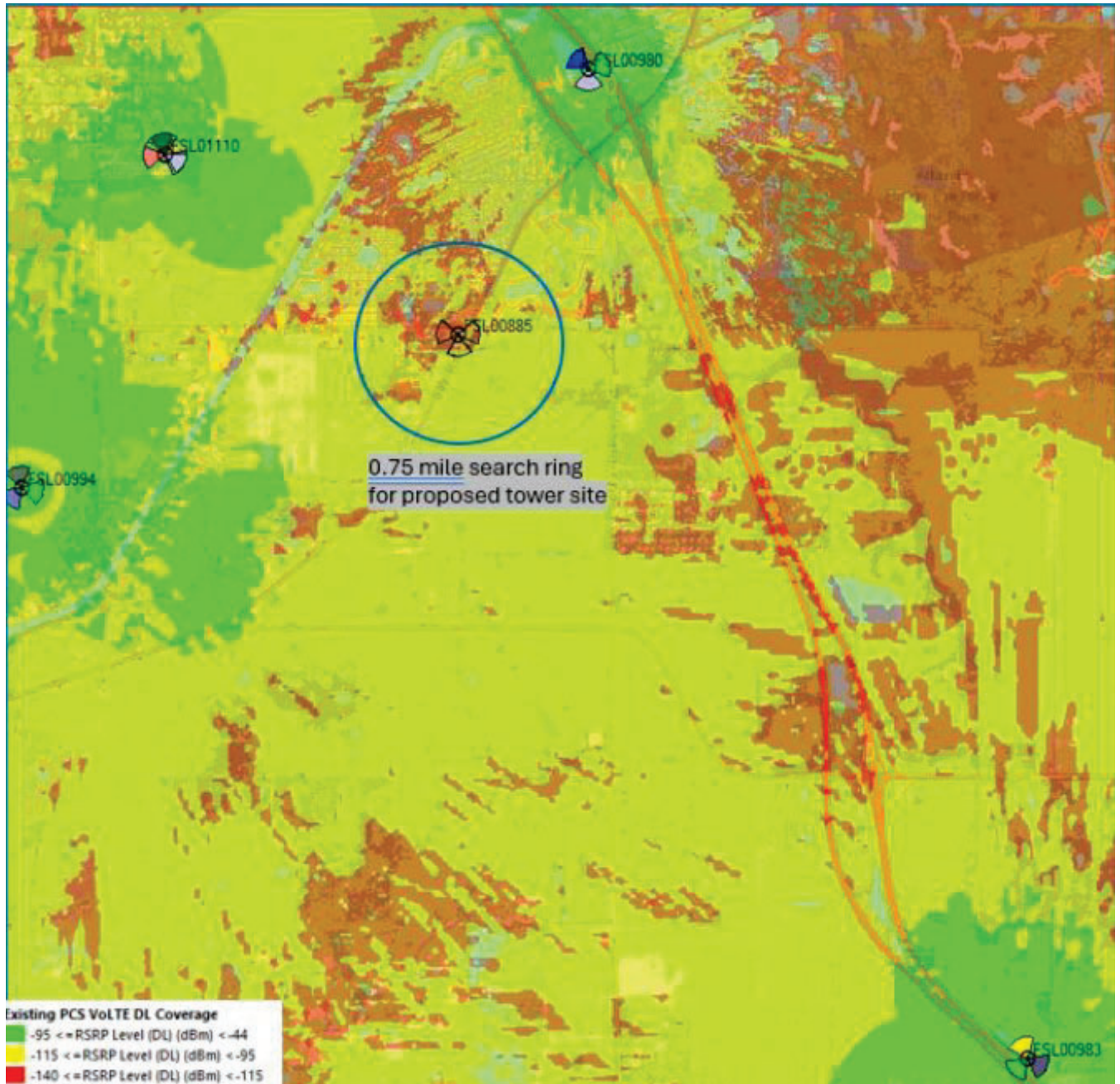


Figure 8: Band 02 LTE VoLTE Coverage from Existing & Proposed AT&T Sites

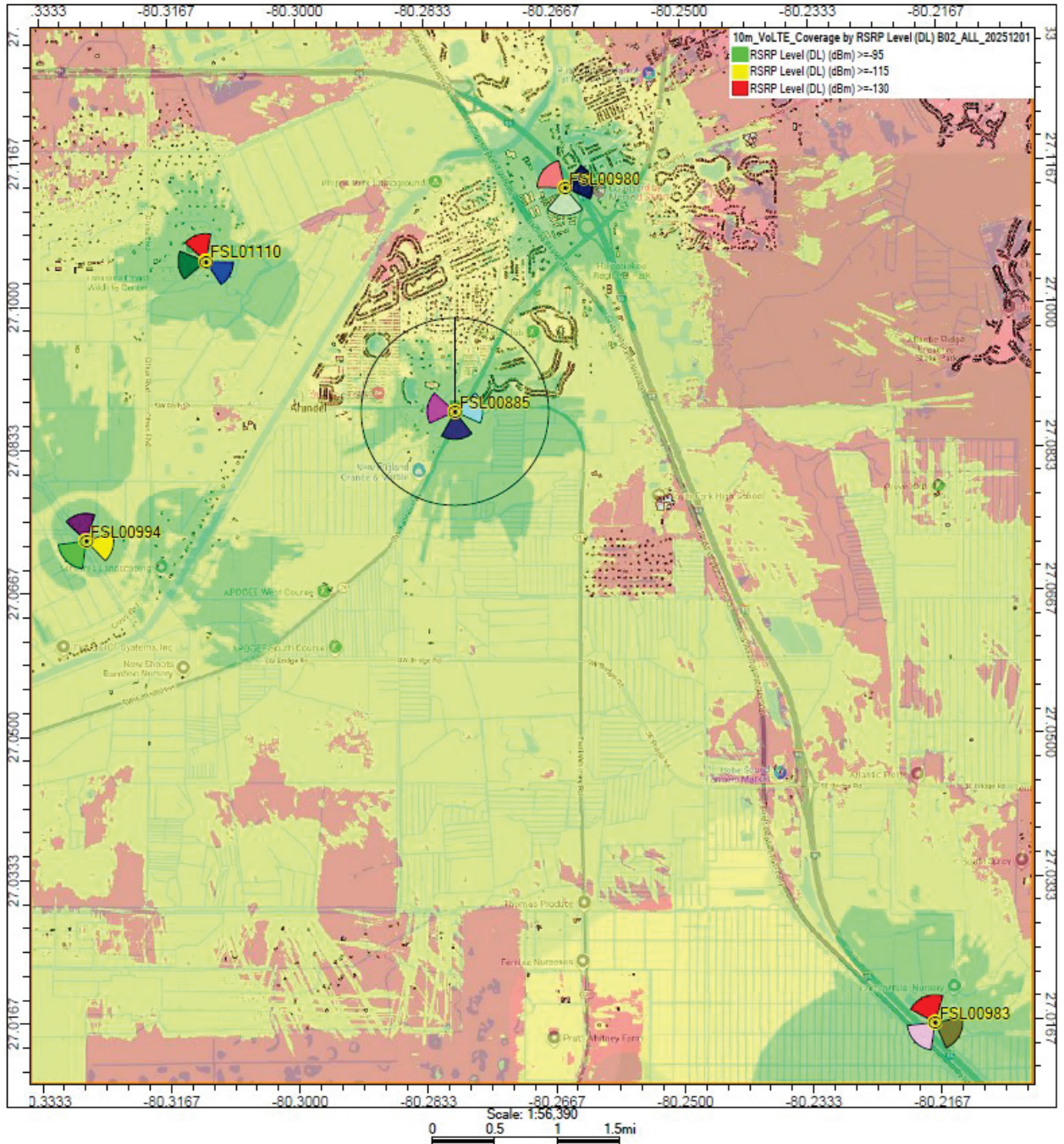
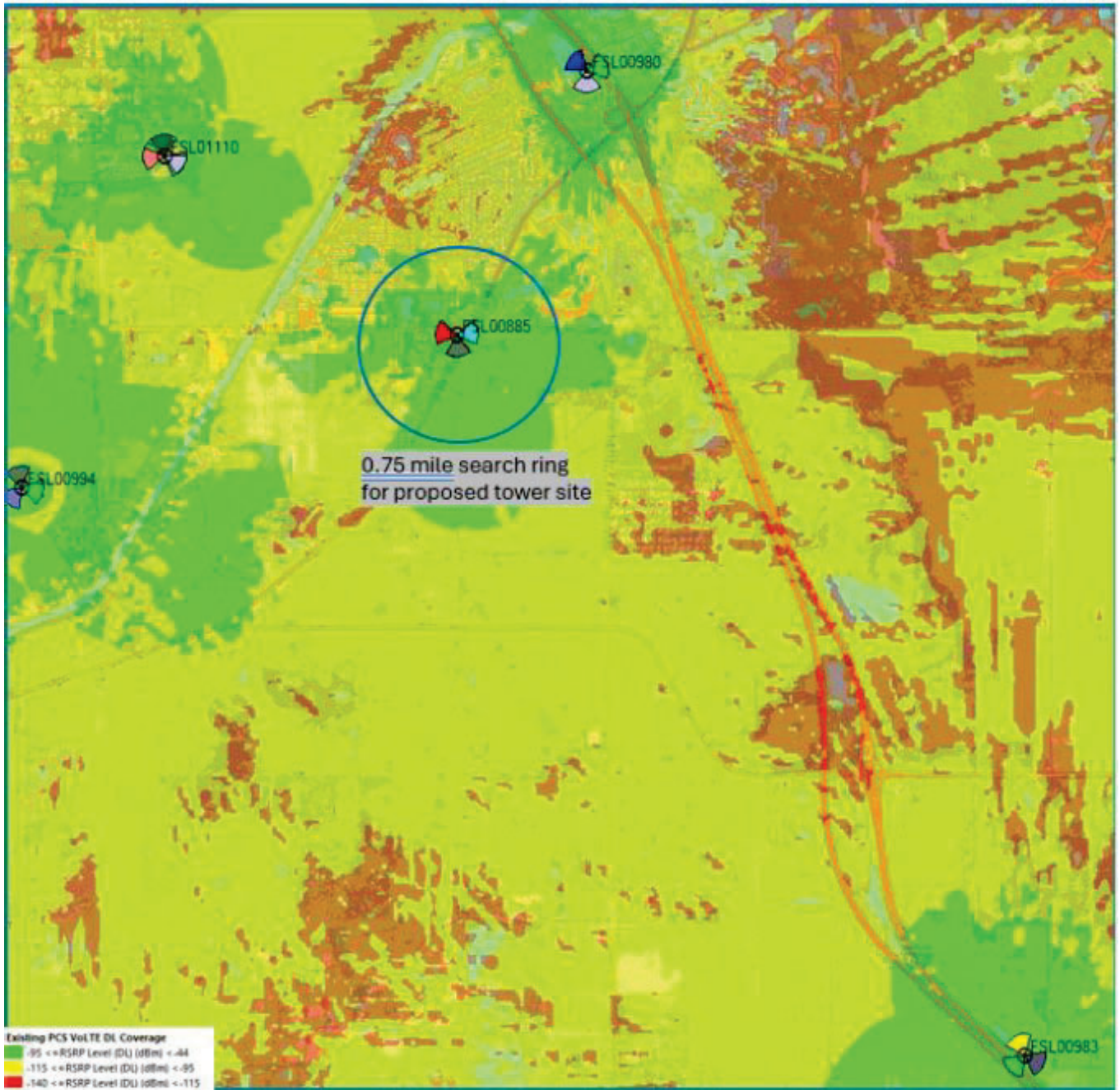


Figure 9: Provided Coverage Map with Existing and Proposed AT&T Sites with good, usable, and marginal VoLTE coverage (2025_0905_K049-004_RESUB.pdf, page 44).



5. Coverage Statistics

Band 2 (1900 MHz)

The table below provides a summary of the covered area per Study and per Receive Signal Level for 1900 MHz using a 3-mile radius around the FP68 site location as a focus zone. Based upon our estimated coverage predictions, we are noting a **5.6% increase in Good** coverage, **3.0% increase in Usable coverage**, and a 0% increase in Marginal coverage.

Figure 10: Focus Zone defined as 3-mile buffer around FP68 location for Band 02 statistics

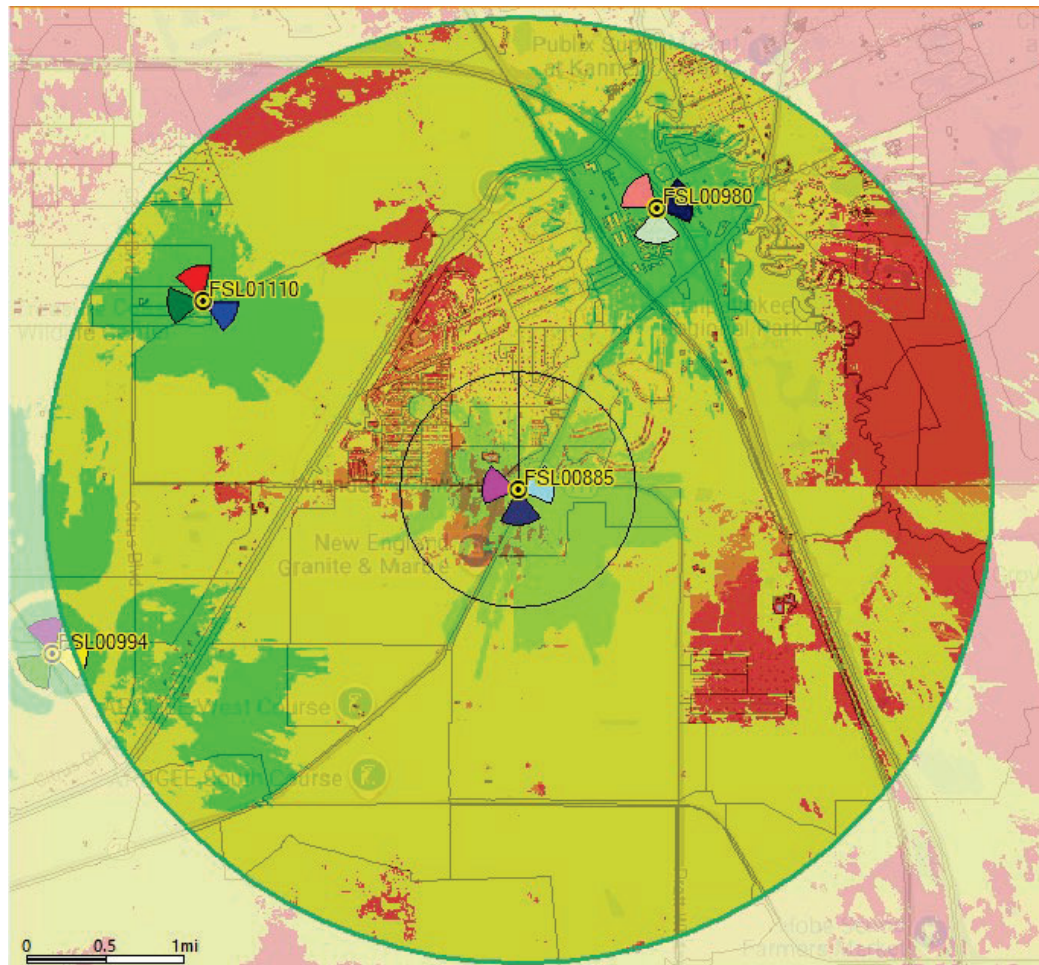


Figure 11: Coverage statistics for Band 02 (1900 MHz)

		Band 02								
Prediction		EXISTING			PROPOSED			DELTA		
		Surface (mi ²)	% Focus Zone	Population	Surface (mi ²)	% Focus Zone	Population	Surface (mi ²)	% Focus Zone	Population
Green (Good VoLTE Outdoor)	RSRP Level (DL) (dBm) >=-95	3.8	13.6	1167.9	5.4	19.2	1742.1	1.6	5.6	574.2
Yellow (Usable VoLTE Outdoor)	RSRP Level (DL) (dBm) >=-115	24.2	85.9	6946.4	25.1	88.9	8100.8	0.8	3.0	1154.4
Red (Marginal VoLTE Outdoor)	RSRP Level (DL) (dBm) >=-140	28.2	99.9	9378.8	28.2	99.9	9444.4	0.0	0.0	65.6

6. Summary

AT&T submitted before-and-after coverage plots for the SR76/711 location, which were independently recreated and validated by 4G Unwired using standard LTE parameters and available LiDAR, terrain, and clutter datasets.

The propagation improvements demonstrated in both the carrier-provided and independently produced maps confirm that a new wireless facility is required to improve VoLTE coverage in this part of Martin County.

Model results using Band 2 show that the new tower significantly strengthens outdoor voice coverage along SR76 and nearby residential and rural areas, correcting existing weak-signal zones.

Coverage statistics indicate a meaningful increase in reliable signal levels (Good and Usable RSRP), supporting improved call reliability, capacity, and emergency-service availability.

No existing tower within a reasonable distance can provide equivalent improvements due to spacing constraints, height limitations, and propagation characteristics.

The findings support the conclusion that the SR76/711 tower will materially expand and reinforce commercial wireless coverage and represent a beneficial infrastructure addition for Martin County.

Anex 1

ASR Sites in Martin County

Name	Source	Longitude	Latitude	Comment
ASR_1210607	ASR	-80.19255556	26.99561111	Good Karma Broadcasting, L.L.C.
ASR_1210608	ASR	-80.19255556	26.99561111	Good Karma Broadcasting, L.L.C.
ASR_1210609	ASR	-80.19255556	26.99561111	Good Karma Broadcasting, L.L.C.
ASR_1210610	ASR	-80.19255556	26.99561111	Good Karma Broadcasting, L.L.C.
ASR_1002219	ASR	-80.31163889	27.10525	Pinnacle Towers LLC
ASR_1020891	ASR	-80.37472222	27.18638889	OPM USA INC
ASR_1027967	ASR	-80.30280556	27.17305556	American Towers LLC
ASR_1000242	ASR	-80.45472222	27.02194444	Martin County Board of County Commissioners
ASR_1000262	ASR	-80.22666667	27.22833333	Martin County Board of County Commissioners
ASR_1000853	ASR	-80.54247222	27.02763889	Global Tower, LLC. through American Towers, LLC
ASR_1001954	ASR	-80.56572222	27.09205556	CCATT LLC
ASR_1013559	ASR	-80.22555556	27.13138889	BOARD OF MARTIN COUNTY COMMISSIONERS
ASR_1018573	ASR	-80.17830556	27.02555556	American Towers LLC
ASR_1018574	ASR	-80.26494444	27.11355556	American Towers LLC
ASR_1018575	ASR	-80.39938889	27.12152778	American Towers LLC
ASR_1018582	ASR	-80.25658333	27.21533333	American Towers LLC
ASR_1028519	ASR	-80.19361111	27.04138889	AT&T WIRELESS SERVICES, INC.
ASR_1029311	ASR	-80.39472222	27.12194444	Hearst Properties Inc.
ASR_1029542	ASR	-80.48033333	27.11891667	Alltel Corporation
ASR_1029603	ASR	-80.24611111	27.10888889	COMMUNITY TELEVISION FOUNDATION OF SOUTH FLORIDA INC
ASR_1029632	ASR	-80.38861111	27.12222222	WTVX Licensee, LLC
ASR_1030234	ASR	-80.25236111	27.03094444	Pinnacle Towers LLC
ASR_1030335	ASR	-80.27388889	27.23722222	Pinnacle Towers LLC
ASR_1030648	ASR	-80.22527778	27.13138889	Southeast Florida Cable, Inc., Debtor-in-Possession
ASR_1030649	ASR	-80.50388889	27.02777778	Southeast Florida Cable, Inc., Debtor-in-Possession
ASR_1030650	ASR	-80.27366667	27.23755556	Southeast Florida Cable, Inc., Debtor-in-Possession
ASR_1047362	ASR	-80.39444444	27.12166667	HEARST CORPORATION DBA = WPBF
ASR_1048319	ASR	-80.23955556	27.17013889	American Towers LLC
ASR_1048764	ASR	-80.25441667	27.08661111	School Board of Martin County, Florida
ASR_1054424	ASR	-80.38191667	27.14625	Crown Castle South LLC
ASR_1054452	ASR	-80.19305556	27.12638889	SBA Properties, LLC
ASR_1054579	ASR	-80.46955556	27.01963889	SBA Sites, LLC
ASR_1055878	ASR	-80.32	27.15527778	SBA Towers III LLC
ASR_1056907	ASR	-80.60888889	26.95805556	Nextel South Corp
ASR_1057759	ASR	-80.13572222	27.06252778	SBA 2012 TC Assets, LLC

ASR_1058004	ASR	-80.19888889	27.13722222	Crown Castle South LLC
ASR_1059846	ASR	-80.18277778	27.04305556	Martin County Board of County Commissioners
ASR_1059847	ASR	-80.24138889	27.17266667	Martin County Board of County Commissioners
ASR_1060578	ASR	-80.42083333	26.9875	OPM-USA (2775) DBA = SHERRY BARWICK
ASR_1060698	ASR	-80.37488889	27.18358333	STC Five, LLC
ASR_1061034	ASR	-80.1645	27.041	FLORIDA POWER & LIGHT COMPANY
ASR_1061056	ASR	-80.32738889	27.07280556	Crown Castle South LLC
ASR_1062441	ASR	-80.50111111	27.16527778	BELLSOUTH MOBILITY INC
ASR_1205825	ASR	-80.092	26.98544444	NEW CINGULAR WIRELESS PCS, LLC
ASR_1207082	ASR	-80.21977778	27.16561111	GOLDEN GATE VENTURES, INC.
ASR_1209716	ASR	-80.30363889	27.16086111	Florida, State of
ASR_1210607	ASR	-80.19333333	26.99569444	Good Karma Broadcasting, L.L.C.
ASR_1210608	ASR	-80.19158333	26.99594444	Good Karma Broadcasting, L.L.C.
ASR_1210609	ASR	-80.19277778	26.99533333	Good Karma Broadcasting, L.L.C.
ASR_1210610	ASR	-80.19225	26.995	Good Karma Broadcasting, L.L.C.
ASR_1213387	ASR	-80.46836111	27.02030556	CSX Transportation
ASR_1218866	ASR	-80.50102778	27.16519444	Crown Communications LLC
ASR_1220974	ASR	-80.14380556	27.07844444	Pinnacle Towers LLC
ASR_1221518	ASR	-80.09197222	26.98538889	SBA Properties, LLC
ASR_1223342	ASR	-80.24683333	27.19122222	STC Five, LLC
ASR_1225706	ASR	-80.21755556	27.01625	Crown Castle South LLC
ASR_1227058	ASR	-80.235	27.17972222	Florida East Coast Railway Company
ASR_1228609	ASR	-80.60536111	26.98580556	American Towers LLC
ASR_1236165	ASR	-80.21436111	27.15183333	Nextel South Corp.
ASR_1237366	ASR	-80.22555556	27.13138889	Martin County Board of County Commissioners
ASR_1240271	ASR	-80.27336111	27.23752778	American Towers LLC
ASR_1240860	ASR	-80.21691667	27.19702778	NEW CINGULAR WIRELESS PCS, LLC
ASR_1246169	ASR	-80.21033333	27.14975	American Towers LLC
ASR_1247854	ASR	-80.48183333	27.04494444	Martin County Board of County Commissioners
ASR_1254152	ASR	-80.24305556	27.18636111	Crown Castle South LLC
ASR_1259033	ASR	-80.26497222	27.22416667	SBA Towers II LLC
ASR_1267209	ASR	-80.23847222	27.24616667	Crown Castle Towers 06-2 LLC
ASR_1267679	ASR	-80.40169444	27.20486111	Tower Development Corporation
ASR_1272385	ASR	-80.15725	27.09747222	Crown Castle South LLC
ASR_1273783	ASR	-80.43069444	27.07819444	South Florida Water Management District
ASR_1274412	ASR	-80.22680556	27.24255556	American Towers, LLC
ASR_1275826	ASR	-80.43069444	27.07819444	South Florida Water Management District
ASR_1281039	ASR	-80.21788889	27.16261111	PI Tower Development LLC
ASR_1283299	ASR	-80.23763889	27.22602778	CCATT LLC
ASR_1284034	ASR	-80.18058333	27.11697222	PJ Development, LLC
ASR_1284632	ASR	-80.23694444	27.13963889	SBA Towers VI, LLC
ASR_1285435	ASR	-80.16275	27.18483333	American Towers LLC
ASR_1288212	ASR	-80.22097222	27.16161111	Crown Castle Towers 06-2 LLC

ASR_1290598	ASR	-80.22291667	27.19655556	American Towers LLC
ASR_1296084	ASR	-80.27541667	27.24922222	T-Mobile South LLC
ASR_1300428	ASR	-80.12897222	26.98516667	Crown Castle Towers 06-2 LLC
ASR_1308187	ASR	-80.55483333	27.06247222	Florida Power & Light Co
ASR_1309916	ASR	-80.12897222	26.98516667	Crown Castle Towers 06-2 LLC
ASR_1313452	ASR	-80.23361111	27.19022222	New Cingular Wireless PCS, LLC
ASR_1313487	ASR	-80.23469444	27.17538889	New Cingular Wireless PCS, LLC
ASR_1313908	ASR	-80.2365	27.18552778	New Cingular Wireless PCS, LLC
ASR_1314516	ASR	-80.22913889	27.18461111	New Cingular Wireless PCS, LLC
ASR_1317227	ASR	-80.10933333	26.98522222	Martin County Board of County Commissioners
ASR_1322608	ASR	-80.19088889	26.99394444	Tarpon Towers II, LLC
ASR_1322956	ASR	-80.27938889	27.08761111	Vertex Development, LLC
ASR_1325501	ASR	-80.23583333	27.17722222	Alltel Corporation
ASR_1328253	ASR	-80.23888889	27.16922222	There's Hope Radio, Inc.