

# 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***

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## **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<br>(ft) | Support<br>Height<br>(ft) | Status      |
|------------------------|-----------|---------|------------|----------|------------------|---------------------------|-------------|
| FSL01110<br>(FP09)     | ASR       | 1002219 | -80.311639 | 27.10525 | 19.69            | 197                       | Constructed |
| FSL00980<br>(SFORK)    | ASR       | 1018574 | -80.264944 | 27.11356 | 0                | 300                       | Constructed |
| FSL00994<br>(Khighway) | ASR       | 1061056 | -80.327389 | 27.07281 | 22.97            | 250                       | Constructed |
| FSL00885<br>(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,<br>transmitter reference | Antenna<br>Centerline<br>Height (ft) | Antenna<br>Azimuth | Antenna model            | Antenna tilt<br>(Mechanical).<br>EDT seen as<br>sufix in antenna<br>model | PA<br>Power<br>(dBm) | Number<br>of MIMO<br>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**

| <b>Band</b> | <b>Duplex Type</b> | <b>Downlink<br/>Frequencies (MHz)</b> | <b>Uplink Frequencies<br/>(MHz)</b> |
|-------------|--------------------|---------------------------------------|-------------------------------------|
| Band 2      | FDD                | <b>1930-1990</b>                      | <b>1850-1910</b>                    |

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.

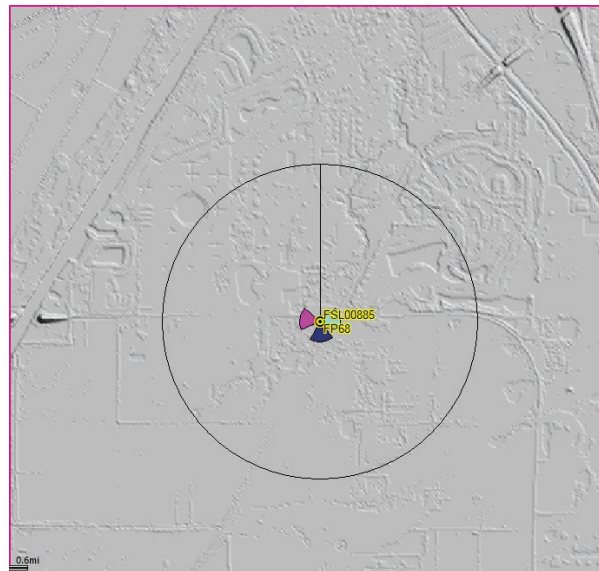
#### 4. Coverage Maps

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.

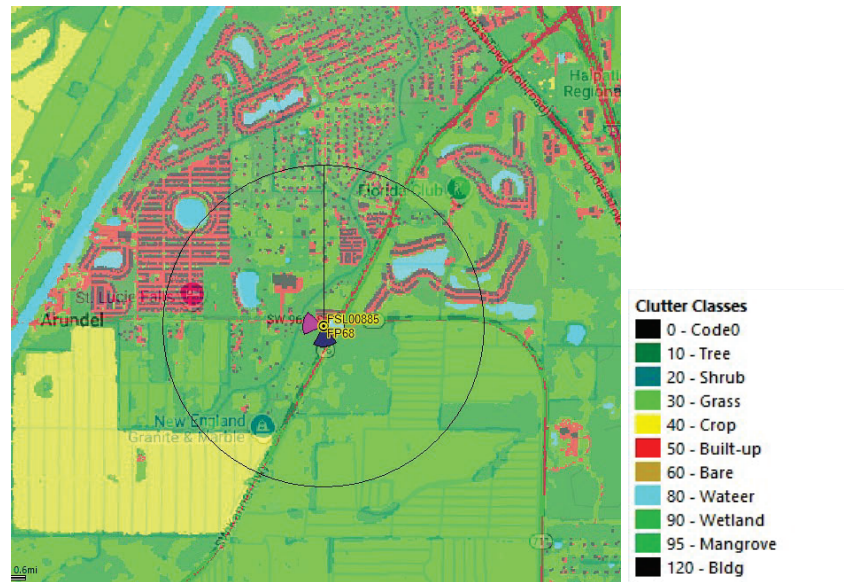
Terrain data was extracted from the USGS dataset at a 10-meter resolution for Martin County, Florida. This is an appropriate resolution for RF modelling in a developed suburban environment. This terrain data will provide propagation model inputs for obstruction.

**Figure 2: 10-meter Terrain DEM for the area**



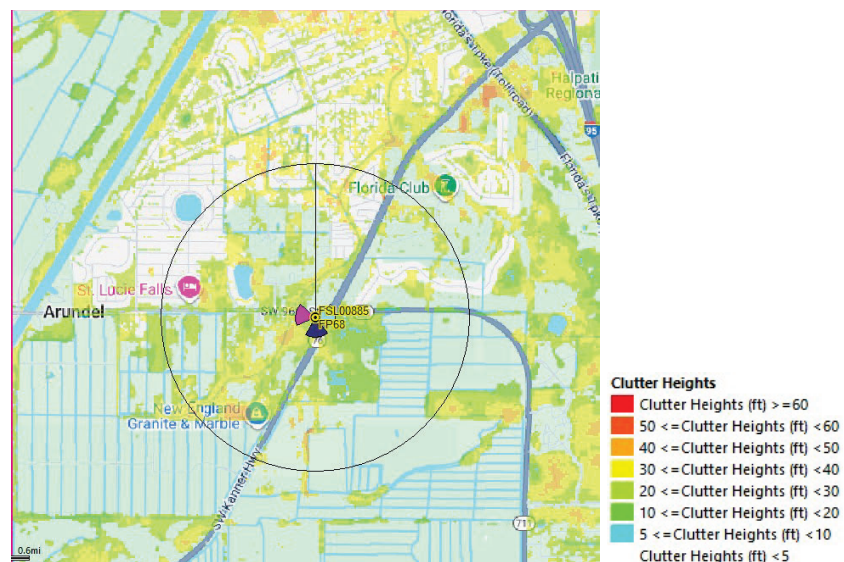
Clutter or Land Area Type of information is designated as Clutter Class data in Atoll and a 10-meter resolution dataset was acquired for Martin County, Florida. This dataset classifies each 10-meter pixel as a different type of area type which impacts the Aster propagation model signal level calculation.

**Figure 3: 10-meter Clutter Classification Overlay**



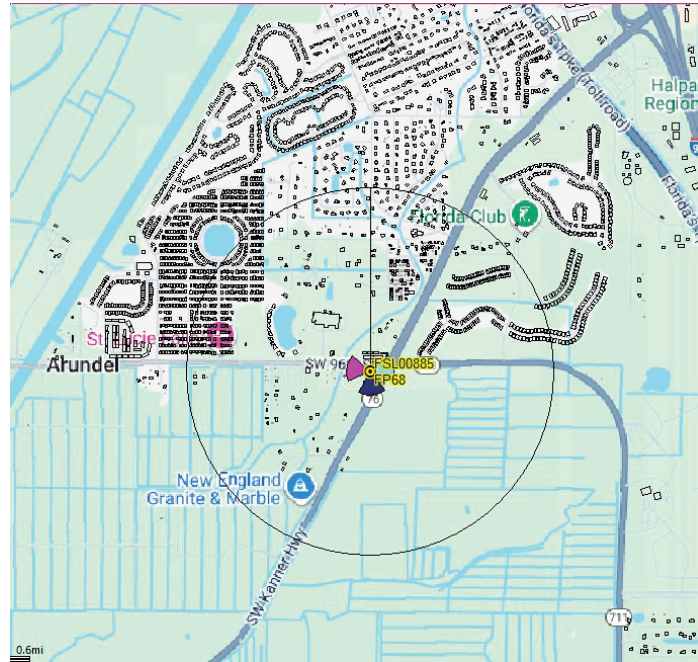
Another input in the Atoll RF Planning tool is the Clutter Height dataset. A 10-meter-resolution clutter-height raster depicting the heights of trees/foliage/obstructions was also imported to reflect the real-world obstructions in the area better.

**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**

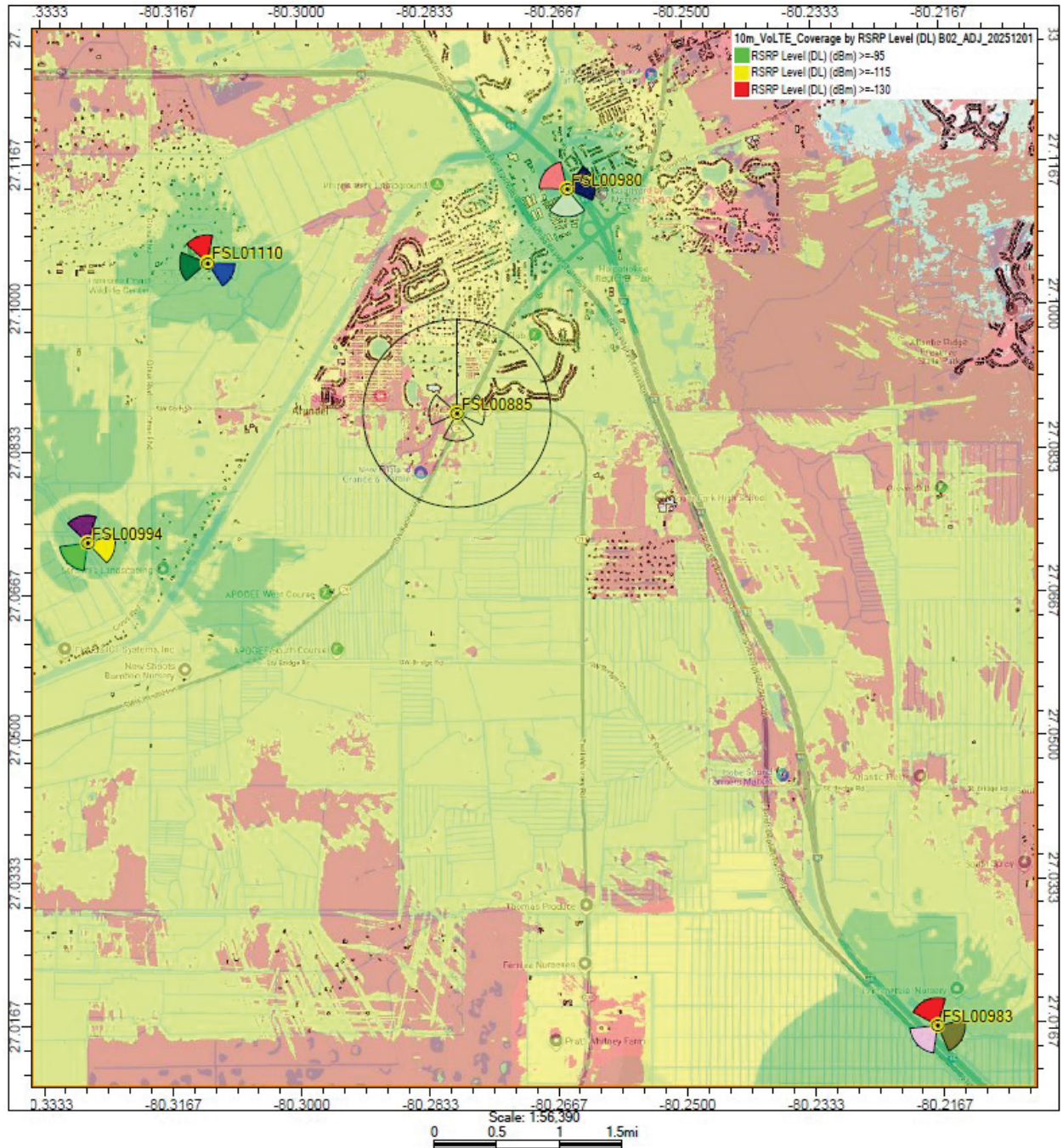
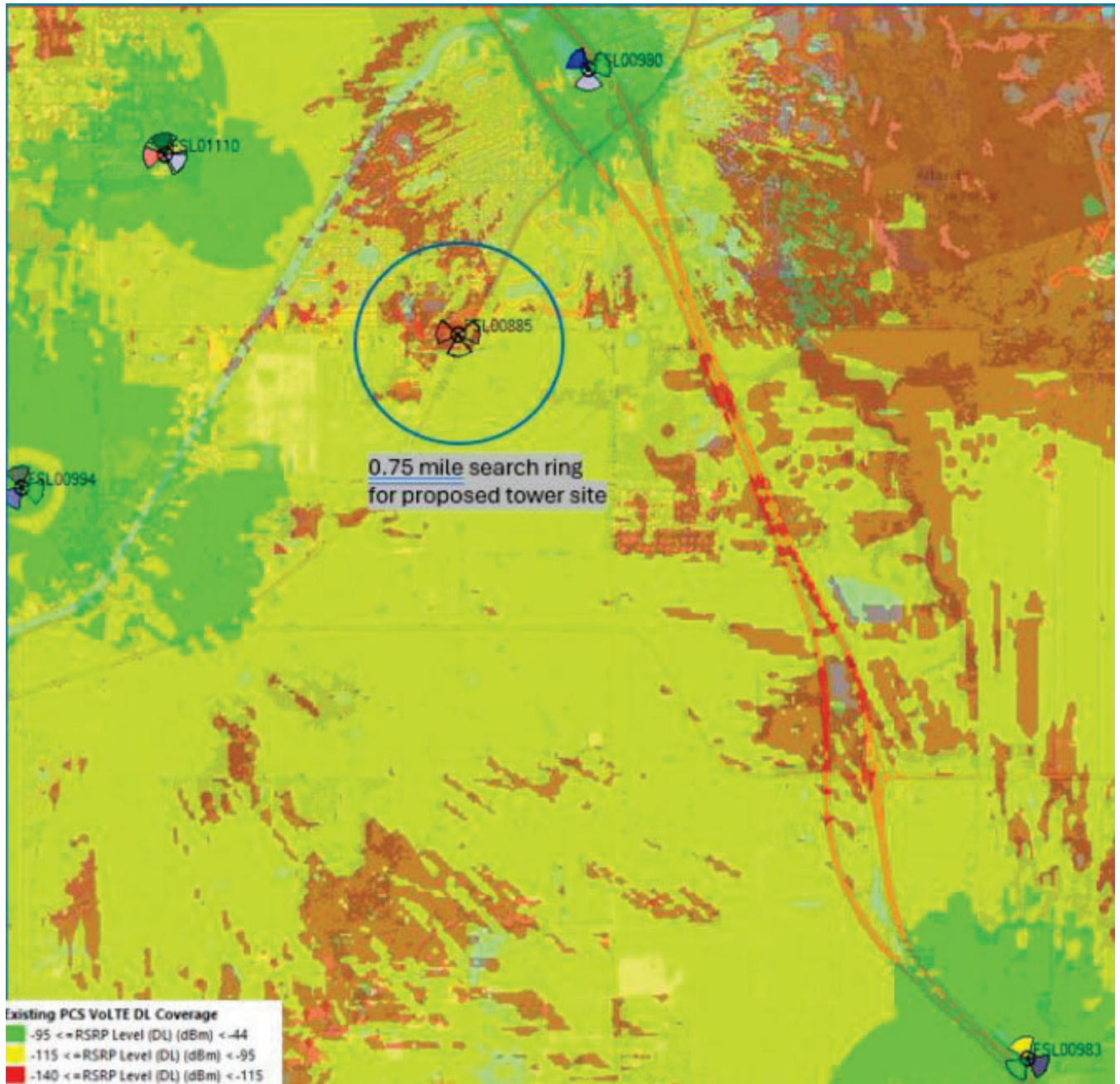


Figure 7: Provided Coverage Map with Existing AT&T Sites with good, usable, and marginal VoLTE coverage (2025\_0905\_K049-004\_RESUB.pdf, page 43)



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

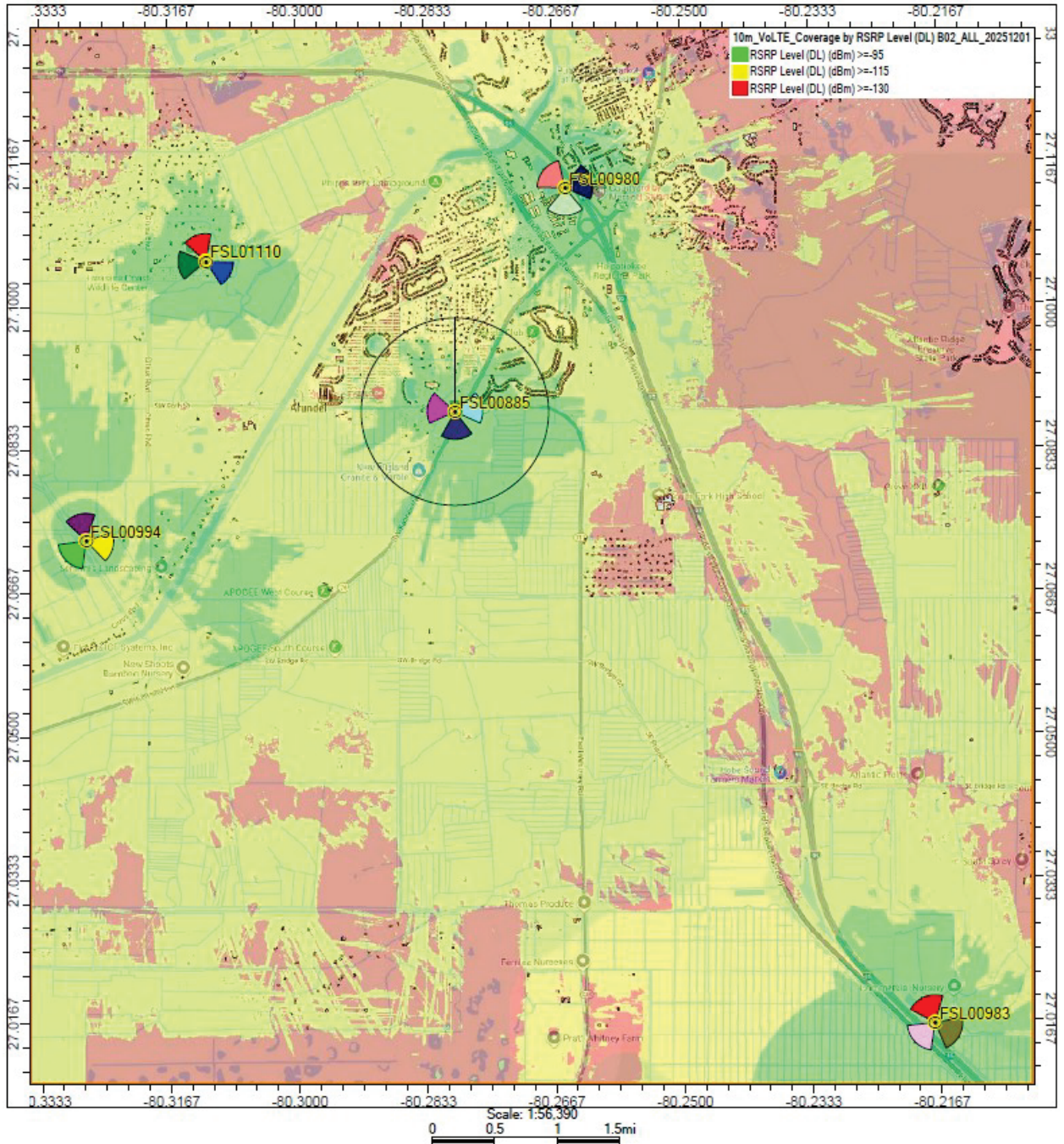
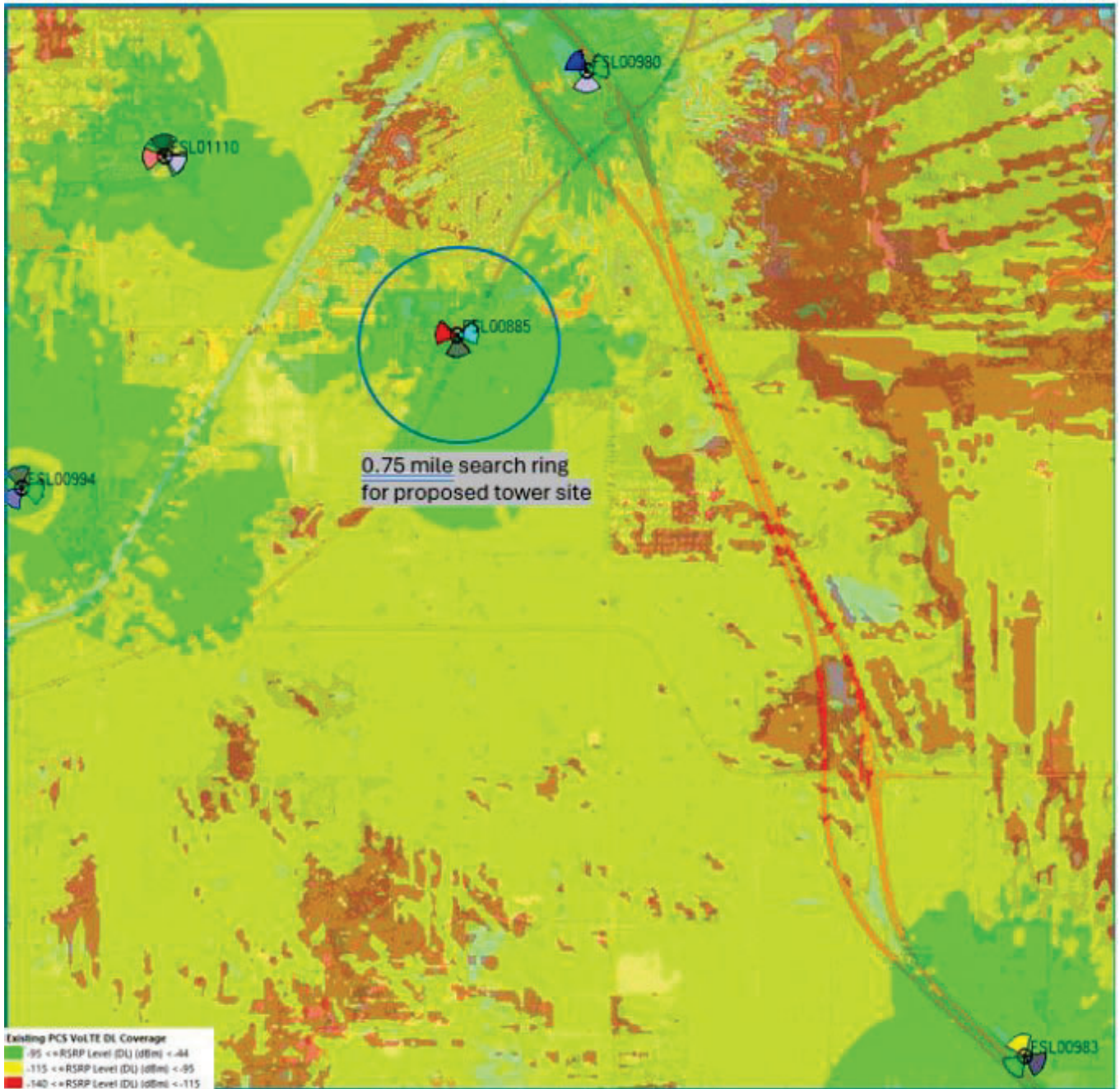


Figure 9: Provided Coverage Map with Existing and Proposed AT&T Sites with good, usable, and marginal VoLTE coverage (2025\_0905\_K049-004\_RESUB.pdf, page 44).

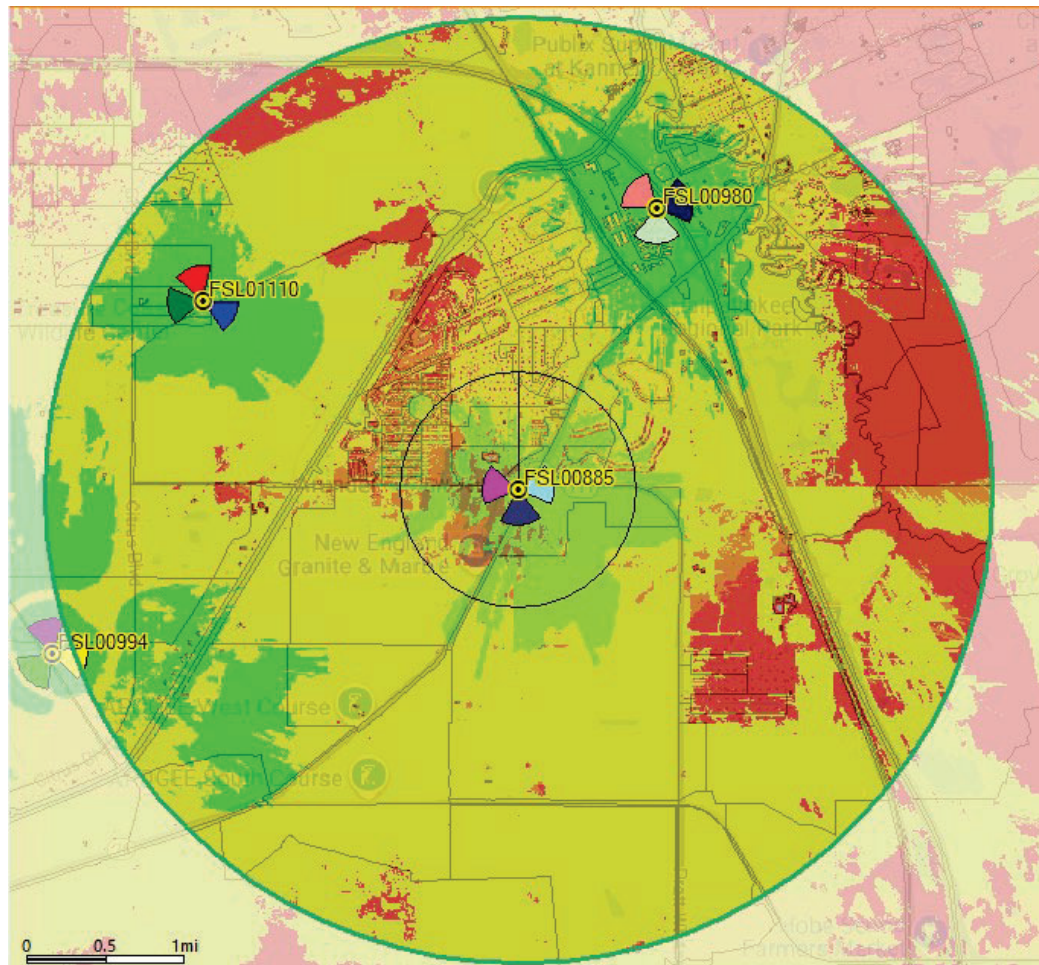


## 5. Coverage Statistics

### 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 <span style="border: 1px solid black; padding: 0 2px;">Band 02</span> |              |            |                            |              |            |                            |              |            |
|-------------------------------|------------------------------|----------------------------------------------------------------------------|--------------|------------|----------------------------|--------------|------------|----------------------------|--------------|------------|
| Prediction                    |                              | EXISTING                                                                   |              |            | PROPOSED                   |              |            | DELTA                      |              |            |
|                               |                              | Surface (mi <sup>2</sup> )                                                 | % Focus Zone | Population | Surface (mi <sup>2</sup> ) | % Focus Zone | Population | Surface (mi <sup>2</sup> ) | % 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.                    |