

## How Should I Format My LTE Coverage Data?

### What the Map Should Show

Mobile wireless broadband providers must submit polygons in a shapefile format representing geographic coverage nationwide (excluding Alaska, but including U.S. territories) for 4G LTE deployed in each frequency band and bandwidth as of August 4, 2017, or later. Each polygon must represent outdoor 4G LTE coverage, as defined by download speeds of 5 Mbps at the cell edge with 80 percent probability and a 30 percent cell loading factor. The terrain and clutter data used to generate the coverage boundaries must have a resolution or BIN size of 100 meters or smaller.

### Feature Attributes

The following data fields must accompany each polygon on the map. The field names must appear in the shapefile attribute table as shown below. Use the shapefile template posted at <https://www.fcc.gov/MF2-LTE-Collection> as a foundation for your maps.

Field Name	Contents	Description	Type	Example
SEQID	Sequence Number	Unique identifier for each polygon	Integer	1
FRN	FCC Registration Number	10-digit FCC Registration Number used in FCC Form 477 filings	Text	0123456789
HOCO	Holding Company / Common Control Name	A single name, such as the holding company name, to identify all commonly-owned or commonly-controlled entities represented by the feature. (See 47 U.S.C. § 153(2) (establishing a greater than 10 percent equity interest, or the equivalent thereof, as indicia of ownership.))	Text	Eastern Wireless
SOFT	Software Product	The name of the propagation model software product used by the filer to generate the coverage map.	Text	PlanetDB
DATE	As of Date	The map represents network coverage as of this date. The date must be August 4, 2017, or later.	Date: yyyy-mm-dd	2017-08-04
SPECTRUM	Spectrum Used	Code for spectrum used for the provision of service. The valid codes are:	Text	90
		90 700 MHz Band		
		91 Cellular Band		
		92 Specialized Mobile Radio (SMR) Band		
		93 Advanced Wireless Services (AWS) 1 Band		
		94 Broadband Personal Communications Service (PCS) Band		
		95 Wireless Communications Service (WCS) Band		
		96 Broadband Radio Service/Educational Broadband Service Band		
		99 600 MHz Band		
		100 H Block		
101 Advanced Wireless Services (AWS) 3 Band				
102 Advanced Wireless Services (AWS) 4 Band				
		<b>Note:</b> If using <u>carrier aggregation</u> to provide qualified coverage, see #2 below.		
BANDWIDTH	Total Channel Bandwidth	The total downlink channel bandwidth in MHz <b>Note:</b> If using <u>carrier aggregation</u> to provide qualified coverage, see #2 below.	Integer	10
RSRP	Edge RSRP	Minimum signal strength (RSRP) in dBm used to determine the cell edge	Integer	-111

## Standards

---

1. All map areas must be simple (i.e., closed, non-overlapping and non-self-intersecting) polygons with a single, unique identifier.
2. Because the cell edge RSRP can vary by spectrum band and bandwidth, filers should report information on spectrum band and bandwidth used to generate the coverage area as specified above. Any variation in spectrum band or bandwidth necessitates the creation of a separate shapefile showing the relevant coverage. In other words, each polygon must have a single value for each of the following fields: spectrum, bandwidth, and RSRP.

If using carrier aggregation and frequency bands overlap, submit only those coverages associated with the band(s) that meet the specification for qualifying 4G LTE. If the edge RSRP varies for any combination of spectrum and bandwidth, enter the minimum of the edge RSRP values for the combination.

**Clarification:** Filers using carrier aggregation across multiple frequency bands to provide qualified LTE coverage must indicate the frequency bands used in the SPECTRUM field by concatenating the relevant codes, separated by commas. For the BANDWIDTH field, add the downlink bandwidths of the aggregated bands.

For example, if a polygon reflects qualified LTE coverage using carrier aggregation across the 700 MHz band (code 90, with 5 MHz downlink bandwidth) and AWS3 band (code 101, with 10 MHz downlink bandwidth), then enter **90,101** in the SPECTRUM field of the shapefile attribute table and **15** in the BANDWIDTH field.

Note that any variation in the combination of frequency bands used necessitates the creation of a separate shapefile showing the relevant coverage.

3. Each shapefile must have an assigned projection with an accompanying .prj file.
4. Each shapefile must use unprojected (geographic) WGS84 geographic coordinate system.
5. The spatial resolution of maps must be 100 meter BINS (approximately three arc-seconds) or smaller. Do not use smoothing techniques to create contours at the cell edge that obscure the BIN resolution when converting from a raster format to a shapefile. The coverage boundaries shall have a resolution of 100 meters or smaller. An arc-second represents the distance of latitude or longitude traversed on the earth's surface while traveling one second (1/3600th of a degree).<sup>1</sup>
6. Each shapefile must be submitted as a \*.zip file. This can be done with a program like WinZip or, in Windows by (a) selecting the files associated with a shapefile; (b) right-clicking the selected files; (c) clicking **Send to**; and (d) clicking **Compressed (zipped) folder....** Be sure that each \*.zip file contains one and only one shapefile.

---

<sup>1</sup> See Esri, *Measuring in Arc-Seconds*, <http://www.esri.com/news/arcuser/0400/wdside.html> (last visited June 25, 2017). Three arc-seconds is a common resolution of terrain databases. See U.S. Geological Survey National Mapping Division, National Mapping Program Technical Instructions at Part 1 General 1.2, 1.4 (1997), <https://nationalmap.gov/standards/pdf/1DEM0897.PDF>.