Broadband Equity, Access, and Deployment (BEAD) Program: Unlicensed Fixed Wireless (ULFW) Service Evidence Template Instructions and Schema

This document is intended to guide BEAD applicants in completing the **Unlicensed Fixed Wireless Service Evidence Template.** The evidence is required to demonstrate the applicant has taken the steps necessary to resolve potential interference and capacity constraints associated with such technology and these steps address the problem of interference from other Part 15 users[1] competing for the same spectrum. The evidence will be used to ensure the applicant is compliant with the NTIA's BEAD Restructuring Policy Notice (issued June 6, 2025).

ULFW Service Evidence Template Submission Instructions

1. Refer to the schema below for detailed instructions on how to complete each tab and its associated fields. All fields are required unless otherwise stated.
2. Save your completed ULFW Service Evidence Template with the following file name format: <<CompanyName>>_ULFWEvidence_<<yyyy-mm-dd>>.xlsx.
3. For applications proposing to use multiple technology types in the network (e.g., fiber and licensed fixed wireless), please upload a template for each technology type used.

ULFW Service Evidence Template Schema

The ULFW Service Evidence Template contains eight tabs:

Tab number	Description
1	Instructions
2	Logical network diagram
3	Network assumptions
4	Tower sites
5	Sectors
6	BSLs (Broadband Serviceable Locations)
7	Uplink MCS table
8	Downlink MCS table

[1] 47 CFR Part 15 (Radio Frequency Devices)

Information must be entered for all fields in Tabs 2 – 8. All supplemental evidence files and documents must be submitted with the completed ULFW Service Evidence Template.

Tab 2. Logical Network Diagram Tab

Field	Data type	Example	Description	Constraints
Logical network diagram	Image	Diagram	Provide a logical diagram showing backhaul connection between the Internet and provider demarcation; provider-operated backbone fiber or wireless network to base station site(s); towers/vertical structures; radio access network (RAN); frequency bands and channels used; example premises installation(s) (vertical structure where applicable, connection from antenna to CPE, connection from CPE to user equipment)	Illustrate a worst-case scenario for link capacities and number of subscribers served per network segment

Tab 3. Network Assumptions Tab

Field	Data type	Example	Description	Constraints
Maximum downlink user throughput (Mbps)	Float	1000.0	Absolute maximum downlink throughput can be provided to a single user	Range: 1.0 to 4,000.0 At least one decimal place
Maximum uplink user throughput (Mbps)	Float	200.0	Absolute maximum uplink throughput can be provided to a single user	Range: 1.0 to 4,000.0 At least one decimal place
Maximum latency of the network (milliseconds)	Float	10.0	End-to-end latency (CPE to	Range: 1.0 to 1,000.0

Field	Data type	Example	Description	Constraints
			internet gateway)	At least one decimal place
Maximum coverage distance (mi)	Float	7.0	Maximum coverage allowable by the manufacturer timeslot configuration (if applicable)	Range: 0.1 to 1000.0 At least one decimal place Specify 999 if network is FDD
Design network availability per month (%)	Percentage	99.999%	Design network availability percentage time including RAN and backhaul components	At least three decimal places
Design oversubscription percentage	Float	20.0	Also known as contention ratio. How many end users share the same network capacity or bandwidth resources	Range: 1.0 to 1,000.0 At least one decimal place
For TDD channels; DL to UL channel ratio	String	4:5:1	TDD (Time Division Duplex) ratio defines how time slots are allocated between uplink and downlink transmissions in wireless networks that use TDD technology	
Network-Specific				
Radio Access Network (RAN) manufacturer	String	Acme Technologies	Name of radio manufacturer	

Field	Data type	Example	Description	Constraints
Maximum number of MIMO layers supported	String	4 Layers Downlink 2 Layers Uplink	Number of independent streams each antenna supports	
Beamforming mechanism/technique and expected capacity gains used to improve throughput and capacity	String	Massive MIMO with expected capacity gains of 2X-6X	Description of beamforming and massive MIMO scheme	Limit of 255 characters N/A if passive antennas are being used
Carrier aggregation techniques to improve throughput and capacity	String	5X20 MHz CA Downlink 3x20 MHz Uplink	Description of channel aggregation methods	Limit of 255 characters
Description of security to prevent unauthorized devices and users from having access to the network	String		Description of the security algorithms the network uses	Limit of 255 characters
Description of user prioritization	String		Description of the scheduler of the RAN and its features	Limit of 255 characters
Description of system redundancy	String		List of features that describe the redundancies in the network that eliminate single point of failures	Limit of 255 characters
Does your system operate solely on the unlicensed spectrum?	String	Yes	Indicate whether the RAN solely operates on unlicensed spectrum such as 5.8 GHz	Valid responses: 'Yes' or 'No'
Describe any coverage threshold margins that should account for	String		Describe the derivations of margins that	Limit of 255 characters

Field	Data type	Example	Description	Constraints
interference. How are these margins accounted for in planning?			account for external interference set in RSL and C/N thresholds in MCS tables	
Describe the effects of unlicensed interference on system capacity.	String		Describe impact of external interference based on applicant experience (if applicable)	Limit of 255 characters
Description of interference cancelation at the CPE. Provide the typical interference suppression in dB	String		Describe any CPE interference cancelation mechanisms	Limit of 255 characters
Description of interference cancelation at the base station. Provide the typical interference suppression in dB.	String		Describe any base station interference cancelation mechanisms	Limit of 255 characters
Describe how the proposed network will meet the following performance targets five years after initial deployment: (1) Provide at least 240 Mbps download and 48 Mbps upload capacity to each Broadband Serviceable Location (BSL), (2)Support simultaneous 12 Mbps throughput for all connected users (BEAD and non-BEAD users)				Please include the following in your calculations: (1) Existing and future network components upon which the application is dependent (2) Oversubscription ratios (3) Number of anticipated subscribers that

Field	Data type	Example	Description	Constraints
				will utilize shared capacity along any segment of the network as of the activation date Calculations should be for the proposed design specific to the BSLs and all network components encompassed the application
Describe how the proposed network will support deployment of 5G, successor wireless technologies, and other advanced services. How will your network be able to support rural capacity backhaul of at least 300 Mbps download and 30 Mbps upload capacity to each of three mobile carriers within the proposed project area?				Your response must include a description of the technology used for the backhaul (if different from the one serving the BSLs) and any modifications that need to be made to the network.

Tab 4. Tower Sites Tab

Field	Data type	Example	Description	Constraints
Site name	String	LIZ001	String identifier of the site	All sites **must** have a unique site name

Field	Data type	Example	Description	Constraints
Latitude	Float	36.243600	Geographic coordinate in decimal degrees (WGS84), indicating the north–south position of the tower site	Range: -90.000000 to 90.000000 At least six decimal places
Longitude	Float	-77.931100	Geographic coordinate in decimal degrees (WGS84), indicating the east–west position of the tower site	Range: -180.000000 to 180.000000 At least six decimal places
Elevation (feet)	Float	5.0	The elevation of the site above mean sea level	Range: -32,000.0 to 32,000.0 At least one decimal place
Address line 1	String	1312 Mockingbird Lane	Primary street address or physical location of the site (e.g., street number and name)	
Address line 2	String	Unit. 1	Additional address information such as unit, suite, apartment, or building number for the tower site	

Field	Data type	Example	Description	Constraints
Address line 3	String	Anytown, USA 00000	City, state, and ZIP code for the tower site	
Backhaul type	String	Wireless	Type of network connection used to link the tower site to the core network	
Backhaul capacity (Mbps)	Float	2000.0	Maximum data transmission capacity of the backhaul connection serving the tower site	Range: 1.0 - 20,000.0 At least one decimal place
Structure type	String	Monopole	Type of physical structure supporting the tower site equipment	
Call signs for FCC licenses	String	WLX123,WLX456	FCC-assigned call signs associated with the licenses required for operation at the site; for unlicensed spectrum use “Unlicensed”; for 3.65 GHz GAA spectrum use “GAA”	Valid responses: Unlicensed, GAA, or list of FCC call signs
Existing or new tower	String	Existing	Indicates whether the tower is an existing structure or if	Valid responses: ‘Existing’ or ‘New’

Field	Data type	Example	Description	Constraints
			applicant is proposing to build a new tower	

Tab 5. Sectors Tab

Field	Data type	Example	Description	Constraints
Sector ID	String	LIZ_A	String identifier of sector	All sectors listed **must** have a unique Sector ID
Name of parent site (the "site name" as referenced in the Tower Sites tab)	String	LIZ001	Name of the parent site that the sector resides	
Radio make and model number	String	Acme RRH 7	Manufacturer make and model of sector radio	
Transmit antenna gain (dBi)	Float	16.0	Gain of sector antenna relative to an isotropic antenna	Range: 0 to 100.0 At least one decimal place
Transmit antenna height (feet)	Float	100.0	Height above ground of sector antenna centerline	Range: 0 to 10,000.0 At least one decimal place
Antenna pointing azimuth (referenced to true north)	Float	0	The direction that sector antenna is point referenced to true north	Range: 0 to 359.9 At least one decimal place
Antenna down tilt (electrical or mechanical in degrees)	Float	-2.0	The vertical tilt of sector antenna (negative is down positive is up)	Range: -30.0 to 30.0 At least one decimal place

Field	Data type	Example	Description	Constraints
Antenna Beamwidth (Degrees)	Float	20.0	The 3 dB beam width of the base station antenna; for antennas that use beamforming, use the minimum beamwidth of a single beam	Range: 0 to 360
Antenna make and model number	String	Acme Antenna SD2500B90	Manufacturer make and model of sector antenna	
Transmit antenna pattern (provide pattern file)	String	Antenna File.PDF	File that contains cut sheet and antenna pattern information	
Transmit max transmitter power per channel (dBmW)	Float	40.0	Maximum transmitted power referenced at radio output	Range: 0 to 1,000.0 At least one decimal place
Total transmit transmission line loss (dB)	Float	1.0	Losses between radio and antenna	Range: 0 to 100.0 At least one decimal place
Effective Isotropic Radiated Power (EIRP) (dBm)	Float	55.0	Power radiated out of antenna	Range: 0 to 1,000.0 At least one decimal place
Operating frequency bands	String	2500, 3700	Frequency band(s) in operation	Must be a list of center frequencies
Total channel bandwidth for all operating bands (MHz)	Float	200.0	Total bandwidth of all channels radiating from a given sector	Range: 1.0 to 10,000.0

Field	Data type	Example	Description	Constraints
				At least one decimal place
Duplexing scheme TDD (Time Division Duplex) or FDD (Frequency Division Duplex)	String	TDD	Duplexing scheme	Valid responses: FDD' or 'TDD'

Tab 6. BSLs (Broadband Serviceable Locations) Tab

Field	Data type	Example	Description	Constraints
FCC/NTIA Location ID	Integer	1111111111	The FCC/NTIA Location ID is a unique 10-digit number assigned by the FCC to identify a location where broadband Internet service is available. These IDs are used in the Broadband Serviceable Location Fabric, a geospatial dataset that maps locations with potential access to fixed broadband internet	All BSLs **must** have a unique FCC/NTIA Location ID

Field	Data type	Example	Description	Constraints
Elevation (feet)	Float	5.0	The elevation of the serviceable location above mean sea level	Range: -32,000.0 to 32,000.0 At least one decimal place
CPE make and model number	String	ACME CPE V4	Manufacturer and model number of the customer premises equipment (CPE) installed at the location	Limit of 255 characters
CPE EIRP (dBm)	Float	30.0	Effective Isotropic Radiated Power (EIRP) of the customer premises equipment (CPE) measure in decibels relative to one milliwatt (dBm)	Range: 0 to 1,000.0 At least one decimal place
Losses from CPE unit to CPE antenna (dB)	Float	0	Signal losses between the CPE unit and its external antenna, measured in decibels (dB)	Range: 0 to 100.0 At least one decimal place
CPE antenna gain (dBi)	Float	16.0	Gain of the CPE antenna, measured in decibels relative to an isotropic radiator (dBi)	Range: 0 to 1000.0 At least one decimal place
Indoor or outdoor installation	String	Outdoor	Indicates whether the Customer Premises	Valid responses: 'Indoor' or 'Outdoor'

Field	Data type	Example	Description	Constraints
			Equipment (CPE) is installed indoors or outdoors	
Signal intensity (e.g., Received Signal Power (RSRP)) (dBm)	Float	-81.1	Measured strength of the received signal (or RSRP for 3GPP type deployments) at the CPE	Range: -200.0 to –30.0 At least one decimal place
Signal quality (e.g., Received Signal Quality (RSRQ), Signal to Noise Ratio (SNR)) (dB)	Float	10.0	Quality of the received signal at the CPE based on metrics such as SNR or RSRQ	Range: -20.0 to 50.0 At least one decimal place
Serving sector ID	String	LIZ_A	String identifier of the sector	Must be one of the sector IDs in the sectors tab
Downlink Maximum Throughput (Mbps) based on MCS (Modulation Coding Scheme) Table	Float	110.0	Maximum achievable data transfer rate from the network to the CPE in Mbps based upon propagation losses and vendor MCS tables (do not use nominal or provisioned throughputs)	Range: 0 to 10,000.0 At least one decimal place Do not use nominal or provisioned throughputs
Uplink Maximum Throughput (Mbps) based on MCS table	Float	23.0	Maximum achievable data transfer rate from the CPE to the network in Mbps based upon	Range: 0 to 10,000.0 At least one decimal place

Field	Data type	Example	Description	Constraints
			propagation losses and vendor MCS tables	Do not use nominal or provisioned throughputs

Tab 7. Uplink MCS Table Tab

Field	Data type	Example	Description	Constraints
Modulation type	String	QPSK	Modulation scheme used for the uplink transmission	Each row **must** have a unique modulation type
Channel bandwidth (MHz)	Float	200.0	Width of the radio channel in MHz used for uplink data transmission	Range: 1.0 to 1,000.0 At least one decimal place
Signal quality (e.g., RSRQ, SNR) (dB)	Float	9.0	Uplink signal clarity measured in dB (typically RSRQ for 3GPP technologies or SNR for proprietary technologies).	Range: -20.0 to 50.0 At least one decimal place
Corresponding signal intensity (e.g., RSRP, Received Power) (dBm)	Float	-80.0	Uplink signal strength measured in dBm (typically RSRP for 3GPP technologies or RSL or RSSI for proprietary technologies)	Range: -200.0 to –30.0 At least one decimal place
Corresponding throughput (Mbps)	Float	23.0	Uplink data rate achieved under the MCS conditions measure in Mbps	Range: 0 to 10,000.0 At least one decimal place

Tab 8. Downlink MCS Table Tab

Field	Data type	Example	Description	Constraints
Modulation type	String	QPSK	Modulation scheme used for the downlink transmission	Each row **must** have a unique modulation
Channel bandwidth (MHz)	Float	200.0	Width of the radio channel in MHz used to transmit downlink data	Range: 1.0 to 1,000.0 At least one decimal place
Signal quality (e.g., RSRQ, SNR) (dB)	Float	9.0	Downlink signal clarity measured in dB	Range: -20.0 to 50.0 At least one decimal place
Corresponding signal intensity (e.g., RSRP, received power) (dBm)	Float	-80.0	Downlink signal strength measured in dBm	Range: -200.0 to –30.0 At least one decimal place
Corresponding throughput (Mbps)	Float	23.0	Downlink data rate achieved under the MCS conditions measured in Mbps	Range: 0 to 10,000.0 At least one decimal place