MONTANA BEAD BENEFIT OF THE BARGAIN

Technical Assistance Webinar

July 1, 2025

Agenda

Topics Covered

- BEAD Program Updates: Overview
- 2025 Program Timeline
- Benefit of the Bargain Round Overview
- Updated Resources
- Next Steps

Bead Program Updates: Overview

NTIA BEAD Restructuring Policy Notice

- NTIA's Restructuring Policy Notice required the following changes to the BEAD Program:
  - Removed non-statutory requirements: NTIA removed non-statutory application and reporting requirements for both MT and subgrantees.
  - Priority Definition: NTIA reverted the definition back to the definition in IIJA
  - NTIA adjusted scoring: Scoring now focuses on cost, with limited secondary criteria.
  - Required a Benefit of the Bargain Round: Applications (new or existing) will be reevaluated for every BEAD-eligible location. All new and previous applicants will be subject to the new policy changes dictated by NTIA.
    - There is no longer a preference/priority in terms of technology type.
    - The application is anticipated to be open July 7th and will close July 25th.

Removal of Non-Statutory Requirements

Labor, Employment, and Workforce Development

- Requirements in the NOFO related to labor, employment, and workforce development are removed.
    - Specifically, the Fair Labor Practices & Highly Skilled Workforce, Advancing Equitable Workforce Development & Job Quality Objectives, and Civil Rights & Nondiscrimination Law Compliance. Additionally, the Contracting with Small & Minority Businesses, Women's Business Enterprises, and Labor Surplus Area Firms sections are eliminated.
- Applicants still must be in compliance with Federal labor and employment laws.

Climate Resiliency

- Requirements in the NOFO related to climate change are removed.
    - Specifically, the Climate Resilience section of the NOFO are eliminated.
- Applicants shall satisfy the requirement to incorporate best practices defined by NTIA for ensuring reliability and resilience of broadband infrastructure by establishing: Risk Managment Plans and Cybersecurity best practices.

Removal of Non-Statutory Requirements

Open Access and Net Neutrality

- Requirements in the NOFO related to open access and net neutrality.
  - Specifically, the Consumer Protections & Interconnection Requirements & Wholesale access sections are eliminated.
- Applicants must still satisfy the requirement to “include interspersed conduit access points at regular and short intervals” for any project that involves fiber optic cable or conduit underground or along a roadway.
  - The Conduit Access Points section of the NOFO is also eliminated.

Local Coordination and Stakeholder Engagement

- Requirements in the NOFO related to local coordination and stakeholder engagement are eliminated
  - Specifically, the Local Coordination and Public Notice sections are eliminated, applicants no longer need to run a public awareness campaign.

Non-Traditional Broadband Providers

- Requirements in the NOFO that favor non-traditional broadband providers (such as municipalities or political subdivisions) are eliminated
  - No change for MT program with regards to applicant eligibility.

Removal of Non-Statutory Requirements

Middle Class Affordability Plan

- Montana is no longer required to develop, implement, and provide updates on a middle-class affordability plan.

Low-Cost Service Option (LCSO)

- IIJA requires BEAD subgrantees to "offer not less than 1 low-cost broadband service option for eligible subscribers"
- Requirements in the NOFO related to BEAD low-cost broadband service options (LCSO) are eliminated.
  - Specifically, the Affordability and Low-Cost Plans section is eliminated.
- BEAD subgrantees still must comply with the provision to offer at least one LCSO, but Eligible Entities will not be able to set the LCSO rate a subgrantee must offer.
  - BEAD subgrantees are responsible for verifying LCSO eligible and may ask potential subscribers to provide documentation necessary to confirm eligibility in alignment with the FCC Lifeline Program

Reverting to IIJA Priority Broadband Definition

Priority vs. Non-Priority

Priority & Non-Priority projects are no longer determined by technology type. Any technology type is capable of being considered a Priority project so long as the following requirements are met.

Priority Application

- Public Notice restored 'Priority' Broadband Project' to IIJA definition:
  - The term "Priority Broadband Project" means a project that provides broadband service at speeds of no less than 100 megabits per second for downloads and 20 megabits per second for uploads, has a latency less than or equal to 100 milliseconds, and can easily scale speeds over time to meet the evolving connectivity needs of households and businesses and support the deployment of 5G, successor wireless technologies, and other advance services.

Non-Priority Application

- Project proposal that would offer service at or above 100/20 Mbps and latency less than or equal to100 milliseconds, but could not necessarily meet the statutory scalability requirements (47 U.S.C. §1702(a)(2)(I)(ii))

Primary & Secondary Scoring Rubric

Policy Notice revised scoring criteria to focus on cost minimization:

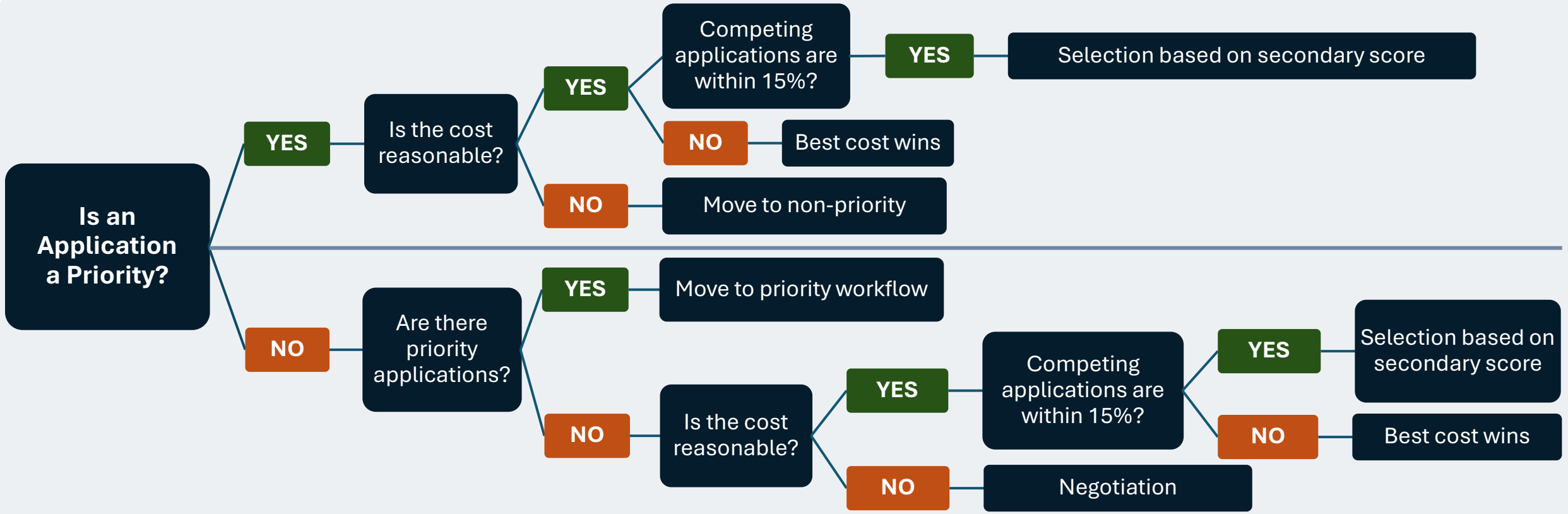
- Primary Criteria
  - Minimal BEAD Program Outlay: Project proposal reflects the lowest overall cost to the Program based on total BEAD funding required to complete the project calculated as the total project cost minus the applicant's proposed match and the cost to the Program per location (i.e., the total BEAD funding that will be required to complete the project divided by the number of BSLs the project will serve)

- Secondary Criteria
  - Speed to Deployment: Project can be completed within (4) years.
  - Speed of Network and Other Technical Capabilities: Ability for network design to demonstrate technical performance (speed and latency) and future scalability.
  - Preliminary/Provisional Subgrantees: Project was previously preliminarily selected.

Montana's CAC Approved Scoring Rubric

Primary Criteria	VALUE	NOTES		
BEAD Outlay	N/A	Average cost per BSL calculated on award request divided by number of proposed locations and considering overall cost to the program.		
Secondary Criteria: If multiple applications are within 15% of the lowest cost per location bid, the following score is calculated				
Speed of Network and Other Technical Capabilities	50	**Download**	**Upload**	**Points**
		≥ 2 Gbps	≥ 2 Gbps	50
		≥ 1 Gbps and < 2 Gbps	≥ 1 Gbps and < 2 Gbps	40
		≥ 500 Mbps and < 1 Gbps	≥ 500 Mbps and < 1 Gbps	30
		≥ 100 Mbps and < 500 Mbps	≥ 100 Mbps and < 500 Mbps	20
		≥ 100 Mbps	< 100 Mbps	10
Preliminary/Provisional Subgrantees	50	50 points for applicants who previously participated by submitting a Main Round application		

Benefit of the Bargain – Application Logic



Updated Project Areas

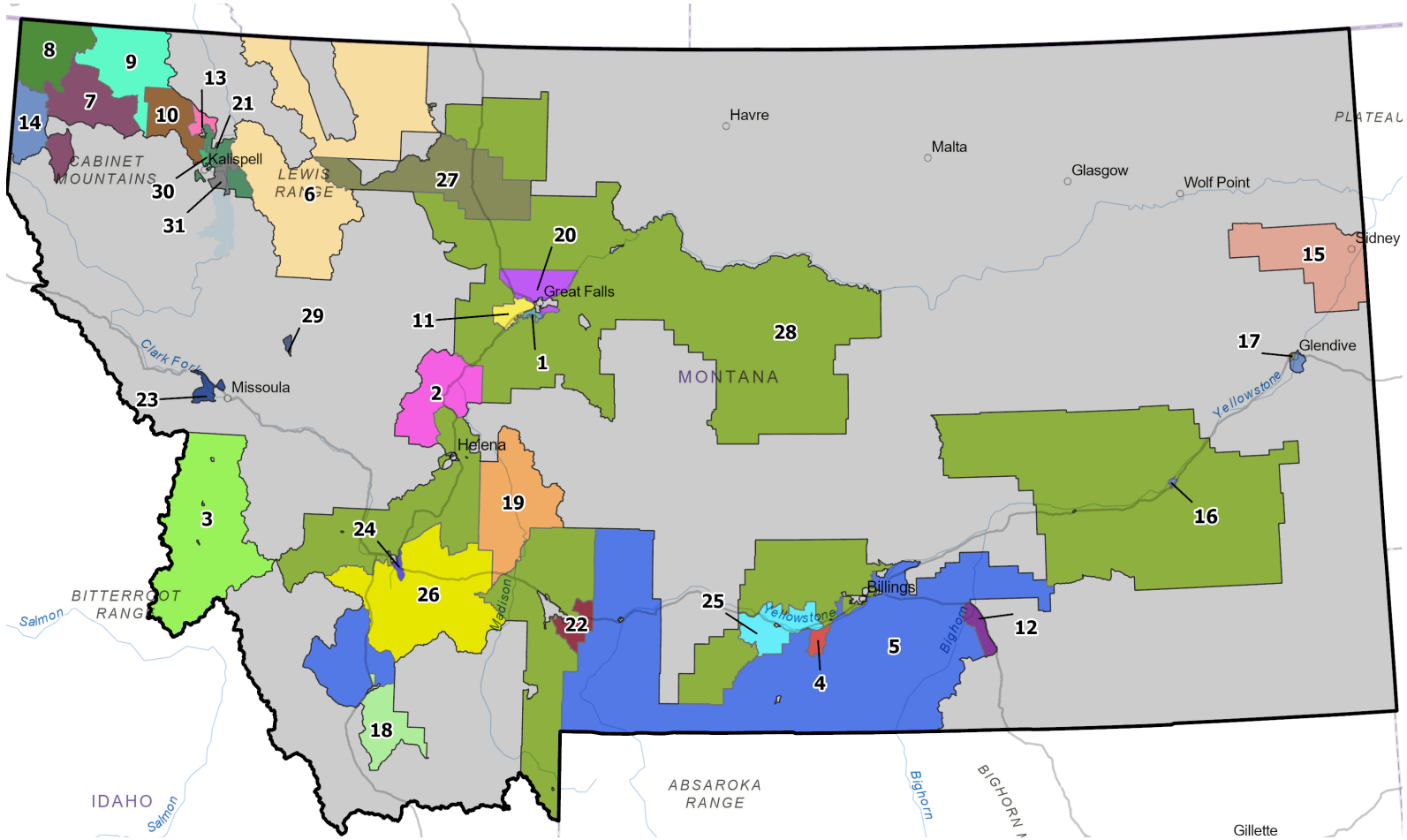
Original Main Round Project Areas

- Initially, applicants were able to design project areas consisting of Census Block Groups (CBGs)

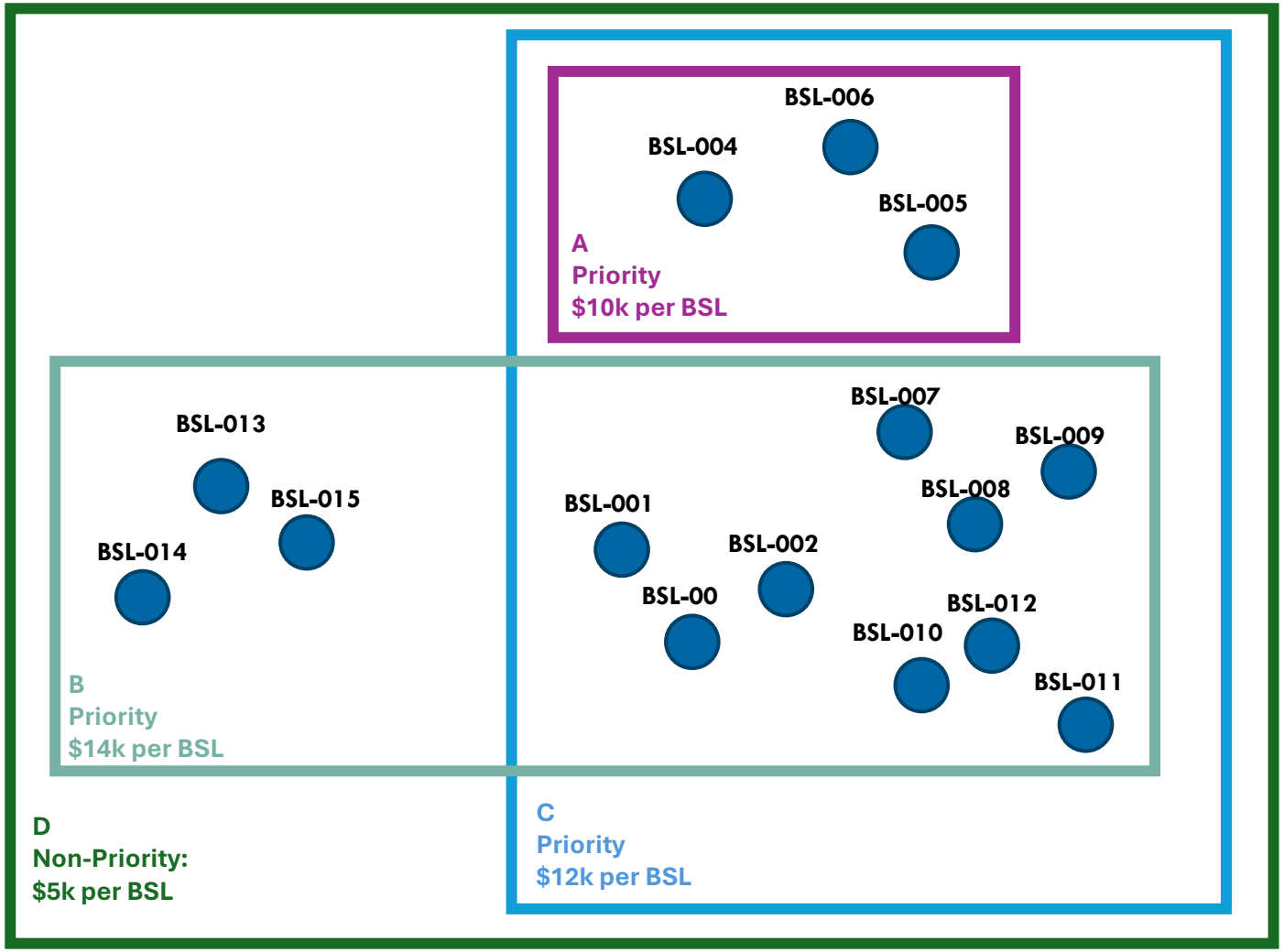
Updated Benefit of the Bargain Project Areas

- NTIA's June 6 restructuring notice and subsequent explanatory guidance confirm that states are fully permitted to design Benefit of the Bargain round processes to allow for efficient re-use of previously developed application materials
- MBO updated the project areas to reflect previously negotiated project areas to allow for streamlined applications
- Applicants can choose which locations within project areas to include in their proposals
- MBO is providing a full list of eligible locations aligned to project areas

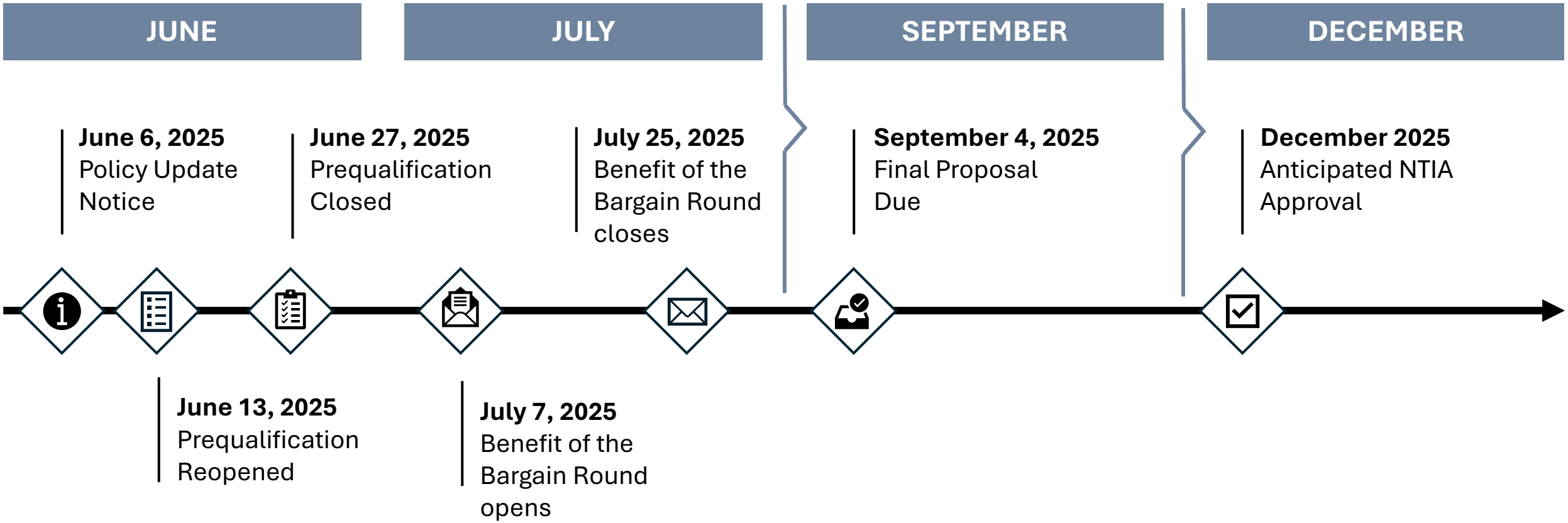
New Project Area Map



Project Area Low-Cost Calculation



2025 Program Timeline



Application Components

Benefit of Bargain Round Overview

Purpose

- The purpose of the Benefit of the Bargain Round (BBR) is to conduct an additional subgrantee selection round for every BEAD-eligible location, regardless of technology, and for applicants to compete on a level playing field based on the updated NTIA NOFO. Overall eligibility remains the same.

New Applicants

- Applicants who did not previously apply to the Main Round application can apply to the BBR, so long as they have submitted a prequalification application.
- New applicants must satisfy all eligibility requirements.

Current Applicants

- Applicants who have already applied to the Main Round application may opt to either :
  a) Update their existing application
  b) Submit a new application for the Benefit of the Bargain via new AmpliFund portal

Application Key Resources

Updated Guides

- A new Benefit of the Bargain User Guide will be published on the MBO website, allowing applicants to view application sections, required documents, and questions from the Benefit of the Bargain application.
- MBO will post an addendum for existing applicants with guidance on how to update their applications.

Templates

- Application templates have been updated to reflect the changes stated in NTIA's policy update. These templates are included in the Benefit of the Bargain User Guide and should be used when applying to the Benefit of the Bargain application round.
- As applicable, existing applicants should utilize the new templates.

Curing

- Applications are subject to curing if they do not meet the appropriate review standards or if insufficient information is provided. Applicants will have 2 days to respond to curing requests.

Major Changes

Overview

- Changes to how an application is determined to be priority and how project areas are defined
- Due to NTIA's Policy Update, there have been changes made to the following sections:
  - Financial Capability
  - Organizational and Managerial Capacity
  - Project Plan
  - Environmental and Historical Preservation Compliance
  - Compliance with Applicable Laws
- Please refer to the Benefit of the Bargain Round User Guide on the connectmt.gov website for further details regarding the Benefit of Bargain Round questions.

Administrative

Benefit of the Bargain Requirements

- This section of the application includes company details and primary and secondary contact information. It also includes administrative information about the project, such as the Project Name, Amount being requested, and the Amount being contributed.

Existing Applicants

- If an existing applicant would like to change their company details or contact information, please submit a new application with this section filled out.
- If an existing applicant would like to change their Project Name, Amount being requested or Amount being contributed, please submit a new application with this section filled out.

Metrics

Benefit of the Bargain Requirements

- This section of the application request key metrics for the proposed broadband project, such as total project cost, amount requested for a grant, and the match amount.
- Applicants will also be asked about key project metrics, such as route miles, jobs created, and a project description.

Existing Applicants

- If an existing applicant would like to change their project cost, amount requested for a grant, or the match amount, please update this section in the application.
- Please ensure the project description includes number of serviceable locations, route miles (either buried or aerial) and jobs created.

Scoring

Benefit of the Bargain Requirements

- Please indicate the maximum speed available to **EVERY** BSL the proposed network will deliver and provide supporting documentation:
  - ≥2 Gbps download over ≥2 Gbps upload
  - ≥1 Gbps and < 2 Gbps download over ≥1 Gbps and <2 Gbps upload
  - ≥ 500 Mbps and < 1 Gbps download over ≥ 500 Mbps and < 1 Gbps upload
  - ≥ 100 Mbps and < 500 Mbps download over ≥ 100 Mbps and < 500 Mbps upload
  - ≥ 100 Mbps download over < 100 Mbps upload
- Please indicate if this application represents a resubmission of a previous application (Y/N)

Existing Applicants

- Existing applications will be scored based on information provided in the curing section of the application.
- For existing applications, please submit the highest speed your project can support and any supporting evidence if not submitted as part of other responses as a question response in Section 10.

Financial Capability

Benefit of the Bargain Requirements

- This section of the application requests financial documentation from the applicants such as financial statements, pro forma, business plan, ILOC letter and Statement of Executive Authority.
- Applicants must also submit documentation certifying their access to the available funds for all project costs exceeding the requested grant amount.

Existing Applicants

- All existing applicants must provider review previously submitted documents for accuracy and address any curing requests. If updates are necessary, please submit in section 10.

NEW GUIDANCE: If an applicant is submitting multiple applications, they should use the same companywide pro forma for all applications. Applicants must ensure detailed assumptions for each project are included.

Organizational & Managerial Capability

Benefit of the Bargain Requirements

- This section of the application requires essential organization documentation and certifications for broadband proposals. Requires applicants to certify proposing LCSO options, compliance with federal labor and employment laws, if they will lay down fiber optic cables and that the proposed project will deliver at least 5 Mbps of capacity.

Existing Applicants

- Applicants should review provided information and provide any updates for curing updates. The Existing Applicant Guidance Document provides a table of questions that are no longer relevant in this section. All updates should be noted in Section 10.
- Existing applications will need to provide certifications in alignment with the Restructuring BEAD Policy Notice. A template is provided and should be uploaded in Section 10.
    - This includes certifications to provide an LSCO Option; Comply with federal labor and employment laws; provide regular access points if a project involved laying fiber optic cables or conduit underground or along a roadway; utilize best practices for reliability and resiliency; comply with Environmental and Historical Preservation requirements; and, that the proposed project will deliver at least 5 Mbps of capacity to each BSL

Project Plan

Priority Project Definition

- The term “Priority Broadband Project” means a project that provides broadband service at speeds of no less than 100 megabits per second for downloads and 20 megabits per second for uploads, has a latency less than or equal to 100 milliseconds, and can easily scale speeds over time to meet the evolving connectivity needs of households and businesses and support the deployment of 5G, successor wireless technologies, and other advance services.

Benefit of the Bargain Requirements

- Applicants will be asked to indicate if they would like their projects to be considered Priority Broadband. If yes, they will be directed to completed indicated templates by technology type and provide evidence for MBO to evaluate the claim.
- Additional requirements include a timeline, project costs, PE certification, etc.

Existing Applicants

- If an existing applicant would like to be considered Priority (regardless of initial application type), applicants should provide a statement as such in Section 10 and upload the appropriate templates.
- Make any adjustments to other resources for project changes or curing.

Environmental Guidelines

Benefit of the Bargain Requirements

- This section is not required for the Benefit of the Bargain Round.

Existing Applications

- The Environmental Guidelines are to encourage applicants to focus on environmental and historical preservation of the project. These are not required by NTIA, but forthcoming information will be announced after the award. No action necessary.

Ownership

Requirements

- This section of the application requests organization ownership information of the applicant's company. Information regarding real parties of interest, stockholders, limited & general partnership members, indirect ownership interests and FCC regulated entities will be required. If updates are necessary, please submit in section 7.

Existing Applicant

- If an existing applicant would like to change their ownership information regarding their company. If updates are necessary, please submit in section 10.

Curing and Other Information

Requirements

- This section provides applicants with the option to submit additional information as part of their applications. This section is optional.

Existing Applicants

- Please submit any changes or updates to your original application in Section 10.

Updated Resources

New Templates: Locations List

Location List

New template replaces previous CBG, cost reduction and non-serviceable locations lists.

All applicants must complete this template.

6.1 Locations List Template

Eligible BSLs Tab

Column Name	Column Functionality	Column Instructions
Project Area ID	Prepopulated [Do not alter]	The Benefit of the Bargain Round project area that the BSL falls within. This data is provided allow Applicants to filter data by CBG. Applicants may not make any changes to this column.
CBG ID	Prepopulated [Do not alter]	The Census Block Group (CBG) that the BSL falls within. The CBG IDs are the same as the previous round of BEAD subgrantee selection. This data is provided allow Applicants to filter data by CBG. Applicants may not make any changes to this column.
BSL ID	Prepopulated [Do not alter]	All BSL location IDs in the BEAD fabric will be populated in this column. Applicants may not make any changes to this column.
BEAD Status	Prepopulated [Do not alter]	The BEAD eligibility status of each BSL in the BEAD fabric. Applicants may not make any changes to this column. Eligible - Unserved: The BSL is eligible for BEAD and can be proposed by the Applicant to be served as part of their application with no additional constraints. Eligible - Underserved: The BSL is eligible for BEAD and can be proposed by the Applicant to be served as part of their application with no additional constraints. Indicated: The BSL has been reported as served in v6 of the BDC Map (NTIA Reason Code 5). Applicants may apply for these BSL in their application but will need to submit a FCC challenge for each BSL prior application submission. The NTIA may reject any of the applied for locations that are designated as indicated. Omitted: The BSL is not BEAD eligible due to either; an identified enforceable commitment (NTIA Reason Code 4), or the BSL was removed from the v6 of the BDC map fabric(NTIA Reason Code 6). Applicants may not apply for omitted BSL in their BEAD application. BEAD Eligible ULFW: The BSL is not BEAD eligible due a substantiated ULFW challenge. Applicants may not apply for omitted BSL in their BEAD application. Not on NTIA approved BEAD Fabric: The BSL is available on v6 of the BDC Map, however the NTIA has not currently approved MBO's request to include these location in its BEAD program. MBO is allowing Applicants to apply for these BSL as long the application is capable of descoping these locations should NTIA reject these locations.
Served by Application	Populated by Applicant [Required]	Select "YES" if the BSL will be served by this application with a speed of not less than 100 Mbps for downloads and 20 Mbps for uploads and latency less than or equal to 100 milliseconds. Select "No - location is a non-BSL or ineligible" (*If this reason is selected, complete the NTIA ineligible or non BSL reason code column and subsequent instructions*) Otherwise leave blank
Technology Code	Populated by Applicant [Required]	Technology Code: Select the type of technology to be deployed to serve the location, using the FCC Broadband Data Collection technology codes in the drop-down list. If the applicant claims that the location is served by an enforceable commitment (*NTIA Reason Code 4*), or that they already serve the location (*NTIA Reason Code 5*) the technology type must be filled in this column.
Anticipated Upload Speed	Populated by Applicant [Required]	Upload Speed Anticipated: Enter the planned maximum upload speed in Mbps.
Anticipated Download Speed	Populated by Applicant [Required]	Download Speed Anticipated: Enter the planned maximum download speed in Mbps.
Low Latency	Populated by Applicant [Required]	Low Latency: Select whether the committed service meets the definition of low latency (1) or does not meet the definition of low latency (0) from the drop-down list. Note: Low latency is defined as having a round-trip latency of less than or equal to 100 ms based on the 95th percentile of measurements.
NTIA Ineligible or non BSL Reason Code	Populated by Applicant [Required]	Ineligible or non-BSL reason: If applicable, select the reason that the location is ineligible for BEAD funding or is a non-BSL from the drop-down list.
Non BSL code	Populated by Applicant [Required]	Non-BSL Code: Only fill in this column if the reason selected in the ineligible or non-BSL reason column is "1: location should not have broadband service." Leave this column empty otherwise. If applicable, select the reason the location should not have broadband service from the drop-down list.
Location Type	Populated by Applicant [Required]	Location Type: Only fill in this column if the reason selected in the ineligible or non-BSL reason column is "2: location does not need mass-market broadband service." Leave this column empty otherwise. If applicable, select the type of building or location that does not subscribe to mass-market broadband from the drop-down list.
Evidence Type	Populated by Applicant [Required]	Type of Evidence: Only fill in this column if a reason is selected in the ineligible or non-BSL reason column. Leave this column empty otherwise. If applicable, select the type of evidence collected from the drop-down list. Approved types of evidence are: (L) attestation by unit of local or tribal government – applicable to reason code 1 (G) attestation by government entity owning location – applicable to reason codes 1 and 2 (F) FCC location challenge identifier – applicable to reason codes 1 and 2 (S) evidence of subscription (service record) – applicable to reason codes 2 and 5 (O) attestation by private property owner – applicable to reason codes 1 and 2 (E) enforceable commitment - applicable to reason code 4 (N) network diagram with attestation by an officer of the provider – applicable to reason code 5
FCC Location Challenge ID	Populated by Applicant [Required]	If providing an FCC location challenge identifier as evidence, enter the FCC location challenge ID for each applicable location in this column.

New Templates: Priority Justification

Guidance

- If an applicant wants to request Priority status for its proposal, certain evidence must be provided using one of the following templates.

New Templates

- Fiber-to-the-Premises (FTTP) Evidence Submission
- Hybrid-Fiber Coaxial Evidence Submission
- Low Earth Orbit Satellite Evidence Submission
- Licensed Fixed Wireless Evidence Submission
- Unlicensed Fixed Wireless Evidence Submission

Next Steps

Next Steps

1. Review new guidance
   - NTIA Restructuring Policy Guidance
   - Benefit of the Bargain Guide
   - Revised Templates
   - Existing Applicant Guidance
2. Determine if your organization is updating an existing BEAD submission or submitting a new application
3. Confirm which locations your application will propose
4. Determine if your application is priority or non-priority
5. Review the curing notes provided *(for original Main Round applicants only)*
6. Attend additional technical assistance office hours
7. Submit application by July 25, 2025

QUESTIONS?

BACKUP SLIDES TEMPLATES

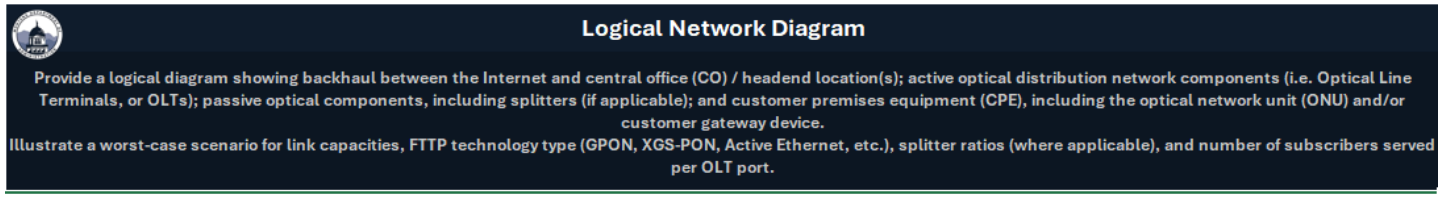
New Templates- FTTP Summary

Fiber-to-the-Premises (FTTP) Evidence Submission

- Excel worksheet, five tabs
  - Logical network diagram – Image of a logical diagram showing backhaul between the Internet and central office
  - Access layer – Describe the access layer FTTP technology, OLT configuration and proposed PON that will be used
  - Headend & internet backbone connectivity – Describe the capacity of all links between the OLTs and Internet
  - Reliability & quality of service – Ensure that service provided will be reliable
  - Performance calculations – Provide calculations demonstrating that network can provide to each location

New Templates –FTTP Logical Diagram

Fiber-to-the-Premises (FTTP) Evidence Submission – Logical Network Diagram



New Templates- FTTP Access Layer

Fiber-to-the-Premises (FTTP) Evidence Submission – Access Layer

Fiber-to-the-Premises (FTTP) Networks 2: Access Layer (CPE to OLT)		
2.1	Describe the access layer FTTP technology that will be used (e.g., GPON, XGS-PON, Active Ethernet). Include the reasoning for this selection based on the density and characteristics of the project area.	
2.2	Describe the OLT configuration, including the number of PON segments per chassis and how the segments are distributed across the chassis.	
2.3	Describe the proposed PON size, including the maximum split ratio, the number of serviceable passings per PON, and the anticipated number of subscribers per OLT port at service activation.	

New Templates- FTTP Headend & Backbone

Fiber-to-the-Premises (FTTP) Evidence Submission – Headend & Internet Backbone

		Fiber-to-the-Premises (FTTP) Networks 3: Headend and Internet Backbone Connectivity
3.1	Describe the capacity of all links between the OLT(s) and the Internet, including the uplinks to backbone routers and the connections to both transit and non-transit peers. Include expected peak utilization and how the design avoids congestion.	

New Templates- FTTP Reliability and QoS

Fiber-to-the-Premises (FTTP) Evidence Submission – Reliability & QoS

		Fiber-to-the-Premises (FTTP) Networks 4. Reliability and Quality of Service Performance Thresholds
4.1	How does the applicant monitor and ensure that roundtrip latency, real-time packet loss, and jitter remain within the following thresholds during typical and peak operating conditions? Latency: ≤ 100 ms Packet loss: ≤ 2% over any 15-second interval Jitter: ≤ 30 ms over any 15-second interval	

New Templates- FTTP Performance Calc.

Fiber-to-the-Premises (FTTP) Evidence Submission – Performance Calculations

	Fiber-to-the-Premises (FTTP) Networks Demonstration of Capacity
5.1	Using worst-case design assumptions, please provide calculations demonstrating that the network can provide to each location at the time of activation: (1) A minimum of 100 Mbps download and 20 Mbps upload (2) ≤ 100 ms roundtrip latency (3) Simultaneous 5 Mbps to all connected locations, including BEAD and non-BEAD users **Calculations should be for the proposed design specific to the BSLs and all network components encompassed the application.* ***Please include the following in your calculations:* *(1) Existing network components upon which the application is dependent* *(2) A summary of the assumptions used for demand modeling*
	Demonstration of Scalability
5.2	Please demonstrate, using calculations based on the submitted technical information, how the proposed network will meet the following performance targets five years after initial deployment, assuming a 25% annual increase in capacity demand: (1) Provide at least 240 Mbps download and 48 Mbps upload capacity to each Broadband Serviceable Location (BSL) (2) Maintain roundtrip latency no greater than 100 ms under projected peak load (3) 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 will utilize shared capacity along any segment of the network as of the activation date*

New Templates- HFC

Hybrid-Fiber Coaxial Evidence Submission

- Excel worksheet, five tabs
  - Logical network diagram
  - Access layer
  - Headend & internet backbone connectivity
  - Reliability & quality of service
  - Performance calculations

New Templates- HFC Logical Diagram

Hybrid-Fiber Coaxial Evidence Submission – Logical Network Diagram

Logical Network Diagram
Provide a logical diagram showing backhaul; headend systems, including cable modem termination system (CMTS); fiber nodes and links; active distribution network components (amplifiers, taps, etc.); and customer premises equipment (CPE), including the cable modem and/or customer gateway device. Illustrate a worst-case scenario for node combining, active component cascades, and number of subscribers served per node and/or CMTS port.

New Templates- HFC Access Layer

Hybrid-Fiber Coaxial Evidence Submission – Access Layer

	Hybrid Fiber-Coaxial (HFC) / Cable Modem Networks Design 2: Access Layer (CPE to CMTS)	
2.1	What is the total upstream and downstream DOCSIS channel capacity allocated per service group? Please specify: (1) Number and type of channels (OFDM, SC-QAM) (2) Total bandwidth (MHz) and throughput (Mbps)	
2.2	What is the average or nominal number of serviceable passings per fiber node by design?	
2.3	What is the maximum number of serviceable passings per fiber node by design?	
2.4	How many anticipated subscribers will be served per node upon activation?	
2.5	What is the DOCSIS version currently deployed?	
2.6	Describe how your CMTS is configured for node segmentation and combining in both the upstream and downstream directions.	

New Templates- HFC Headend & Backbone

Hybrid-Fiber Coaxial Evidence Submission – Headend & Internet Backbone

	Hybrid Fiber-Coaxial (HFC) / Cable Modem Networks Design 3: Headend and Internet Backbone Connectivity	
3.1	Describe the capacity of all links between the CMTS and the Internet backbone, including the uplinks to backbone routers and the connections to both transit and non-transit peers. Include expected peak utilization and how the design avoids congestion.	
3.2	Describe the physical and logical redundancy of the proposed network, including CMTS components, backbone network devices, and core routers and backbone transport links. Include a description of any protection schemes in place, such as dual-homing, ring architecture, or failover protocols.	

New Templates- HFC Reliability and QoS

Hybrid-Fiber Coaxial Evidence Submission – Reliability & QoS

	Hybrid Fiber-Coaxial (HFC) / Cable Modem Networks Design 4. Reliability and Quality of Service Performance Thresholds	
4.1	How does the applicant monitor and ensure that roundtrip latency, real-time packet loss, and jitter remain within the following thresholds during typical and peak operating conditions? Latency: ≤ 100 ms Packet loss: ≤ 2% over any 15-second interval Jitter: ≤ 30 ms over any 15-second interval	
4.2	What mechanisms are in place to detect and mitigate congestion? Please describe any: (1) Queue management, (2) Traffic prioritization, (3) DOCSIS scheduler configurations, or (4) Any other measure taken to reduce network congestion.	
	Network Management & Redundancy	
4.3	How is network congestion detected in real time?	
4.4	What mechanisms are used to prioritize or shape traffic during periods of congestion?	
4.5	What redundancy exists in the last-mile access network to protect against performance degradation or outages?	

New Templates- HFC Performance Calc.

Hybrid-Fiber Coaxial Evidence Submission – Performance Calculations

	Hybrid Fiber-Coaxial (HFC) / Cable Modem Networks Design	
	Demonstration of Capacity	
5.1	Using worst-case design assumptions, please provide calculations demonstrating that the network can provide to each location at the time of activation: (1) A minimum of 100 Mbps download and 20 Mbps upload (2) ≤ 100 ms roundtrip latency (3) Simultaneous 5 Mbps to all connected locations (BEAD and non-BEAD users) **Calculations should be for the proposed design specific to the BSLs and all network components encompassed the application.* ***Please include the following in your calculations:* *(1) Existing network components upon which the application is dependent* *(2) A summary of the assumptions used for demand modeling* *(3) Oversubscription ratios* *(4) Existing and future network components upon which the application is dependent*	
	Demonstration of Scalability	
5.2	Please demonstrate, using calculations based on the submitted technical information, how the proposed network will meet the following performance targets five years after initial deployment, assuming a 25% annual increase in capacity demand: (1) Provide at least 240 Mbps download and 48 Mbps upload capacity to each Broadband Serviceable Location (BSL) (2) Maintain roundtrip latency no greater than 100 ms under projected peak load (BEAD and non-BEAD users) (3) Simultaneous 12 Mbps to all connection locations (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) All anticipated subscribers that will utilize shared capacity along any segment of the network at as of the activation date*	
	Demonstration of Support for 5G and Advanced Services	
	Please demonstrate, using calculations based on the submitted technical information, how the proposed network will support deployment of 5G, successor wireless technologies, and other advanced services. For the purpose of this demonstration, calculations should be based on one of the	

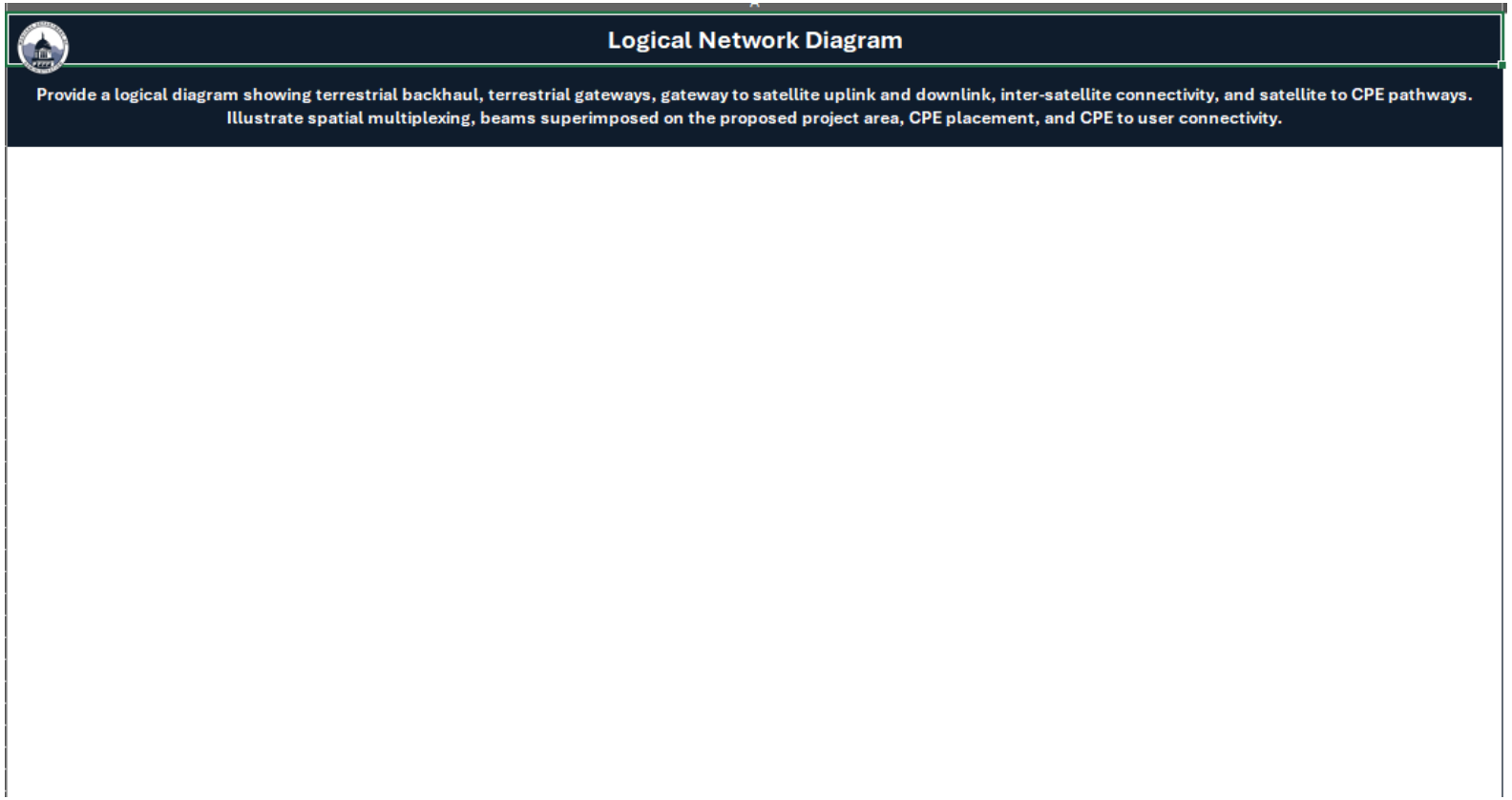
New Templates- LEO

Low Earth Orbit Satellite Evidence Submission

- Excel worksheet, six tabs
  - Logical network diagram
  - Access layer
  - Customer Premises Equipment
  - Gateway Infrastructure and Satellite Uplinks
  - Reliability and Quality of Service
  - Performance Calculations

New Templates- LEO Network Diagram

Low Earth Orbit Satellite Evidence Submission – Logical Network Diagram



New Templates- LEO Access Layer

Low Earth Orbit Satellite Evidence Submission – Access Layer

	Low Earth Orbit Satellite Design – Access Layer	
	2.1: Link Characteristics	
2.1.1	What is the downlink channel size (in MHz) per beam?	
2.1.2	What is the uplink channel size (in MHz) per beam?	
2.1.3	What modulation and coding schemes are used for uplink and downlink transmissions?	
2.1.4	What are the typical and peak spectral efficiency values (bps/Hz) achieved with these schemes?	
2.1.5	What are the minimum receive sensitivities or required SNR values (in dB) for each supported modulation and coding level?	
2.1.6	What is the fade margin (in dB) available for both uplink and downlink paths under worst-case conditions (e.g., heavy rain, atmospheric attenuation)? If more than one type of CPE is offered, provide fade margin values for each type.	
	2.2: Beam & Spectrum Architecture	
2.2.1	How many beams are generated per satellite?	

New Templates- LEO CPE

Licensed Fixed Wireless Evidence Submission – Customer Premises Equipment

	Low Earth Orbit Satellite Design – Customer Premise Equipment	
	3.1: CPE & Connectivity	
3.1.1	What spectrum is used for the link between the CPE and the satellite, and what is the link capacity?	
3.1.2	What type of connection does the CPE provide to end-user devices at the premises (e.g., Ethernet, Wi-Fi), and what is its maximum supported throughput?	
3.1.3	Does the proposed service include professional installation?	
3.1.4	Will the provider install the service on rooftops or other elevated locations if necessary to obtain an unobstructed view of the sky?	
	3.2: Sky View Requirements	
3.2.1	What is the minimum area of unobstructed sky view required at a customer location for reliable service?	
3.2.2	What is the expected impact on performance (e.g., throughput, latency, packet loss, connection stability) if the sky view is partially	

New Templates- LEO Gateway & Uplinks

Licensed Fixed Wireless Evidence Submission – Gateway Infrastructure & Satellite Uplinks

	Low Earth Orbit Satellite Design – Gateway Infrastructure & Satellite Uplinks	
	4.1: Gateway Side Location and Design	
4.1.1	How are gateway sites selected and constructed to manage the effects of local weather, foliage, terrain, and radio frequency interference?	
4.1.2	What operational or design measures are taken to ensure resiliency and consistent link quality under adverse conditions?	
	4.2:Backhaul and Capacity from Gateway to Internet Backbone	
4.2.1	Describe the upstream and downstream terrestrial backhaul used to connect gateway sites to the internet backbone and data centers.	
4.2.2	What is the current capacity of these backhaul connections?	
4.2.3	How is capacity scaled over time as demand increases?	
	4.3:Gateway to Satellite Link Characteristics	
4.3.1	What is the typical downlink and uplink channel size per gateway-to-satellite link?	

New Templates- LEO Reliability and QoS

Licensed Fixed Wireless Evidence Submission – Reliability and QoS

	Low Earth Orbit Satellite Design – Reliability and Quality of Service	
	5.1: Performance Threshold	
5.1.1	How does the applicant monitor and ensure that roundtrip latency, real-time packet loss, and jitter remain within the following thresholds during typical and peak operating conditions? Latency: ≤ 100 ms Packet loss: ≤ 2% over any 15-second interval Jitter: ≤ 30 ms over any 15-second interval	
	5.2: Network Management & Redundancy	
5.2.1	How is network congestion detected in real time?	
5.2.2	What mechanisms are used to prioritize or shape traffic during periods of congestion?	
5.2.3	How does the system mitigate packet loss or disruption during handoffs between satellites?	
5.2.4	What redundancy is built into the last-mile access path to preserve session continuity during brief interruptions or link degradation?	

New Templates- LEO Performance Calc.

LEO Evidence Submission – Performance Calculations

	Low Earth Orbit Satellite Design – Performance Calculations 6.1:Demonstration of Capacity	
6.1.1	Using worst-case design assumptions, please provide calculations demonstrating that the network can provide to each location at the time of activation: (1) A minimum of 100 Mbps download and 20 Mbps upload (2) ≤ 100 ms roundtrip latency (3) Simultaneous 5 Mbps to all connected locations sharing the beam, including BEAD and non-BEAD users *Calculations should be for the proposed design specific to the BSLs and all network components encompassed the application. **Please include the following in your calculations: (1) Existing network components upon which the application is dependent (2) Oversubscription ratios Your calculations must account for total spectrum usage within the beam(s) serving the proposed project area as well as total spectrum usage and capacity between the satellite(s) and terrestrial gateway(s).	
	6.2: Demonstration of Scalability	
6.2.1	Please demonstrate, using calculations based on the submitted technical information, how the proposed network will meet the following performance targets five years after initial deployment, assuming a 25% annual increase in capacity demand: (1) Provide at least 240 Mbps download and 48 Mbps upload capacity to each Broadband Serviceable Location (BSL) (2) Maintain roundtrip latency no greater than 100 ms under projected peak load (3) Support simultaneous 12 Mbps throughput for all connected users sharing beam capacity (including BEAD-funded and non-BEAD users) *Calculations should be for the proposed design specific to the BSLs and all network components encompassed the application **Your response must:	

New Templates- ULFW

Unlicensed Fixed Wireless Evidence Submission

- Excel worksheet, eight tabs
  - Instructions
  - Logical network diagram
  - Network assumptions
  - Tower sites
  - Sectors
  - BSLs
  - Uplink MCS Table
  - Downlink MCS Table

New Templates- ULFW Instructions

Unlicensed Fixed Wireless Evidence Submission - Instructions

Unlicensed Fixed Wireless Evidence Submission Template – Instructions	
Below are instructions to properly complete this form. Each tab must be completed in full. For additional information regarding the details that must be provided for each field in this spreadsheet, please refer to the Unlicensed Fixed Wireless Service Evidence Template Schema that is provided in the Instruction Manual.	
Tab Name	**Tab Instructions**
Logical Network 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.
Network Assumptions	Network assumptions are details of typical global parameters used in the network design as should be specified.
Tower Sites	Each site in the network must be designated by an individual row in the table. The site name, which is specifically a unique name for a given site, is its location described by latitude and longitude in decimal coordinates projected to NAD83 datum. An address should be included for each site. The structure type is a description of the tower, such as monopole or guyed tower. The backhaul type parameter should be described as the technology and medium used such as fiber, wireless, coax, etc. The capacity of the backhaul is described in Megabits Per Second (Mbps).
Sectors	Each sector in the network must be designated by an individual row in the table. The sector ID must be a unique name for a given sector. That sector must belong to a parent site in the previous sheet. The transmit antenna parameters are described in decibels referenced to a milliwatt (dBmW). Antenna gain is in reference to an isotropic antenna. The operating band is the name describing the frequency band in use such as CBRS, BRS/EBS, etc. The bandwidth is the total bandwidth in use at the given sector antenna. The duplexing is described as either Time Divisional Duplexing (TDD) or Frequency Division Duplexing (FDD).
BSLs (Broadband Serviceable Locations)	A Broadband Serviceable Location (BSL) is a business or residential location in the United States where mass-market fixed broadband internet access service is, or can be, installed. It's essentially a point on a map representing a location that the FCC deems eligible for broadband service. Each BSL in the network must be designated by an individual row in the table. The physical location, either indoor or outdoor, of the customer premises equipment (CPE) must be provided. The BSL must belong to a parent sector ("Serving Sector ID"), and the CPE antenna parameters are described in decibels referenced to a milliwatt (dBmW). Antenna gain is in reference to an isotropic antenna. The signal intensity is typically known as the received power or reference symbol received power and shall be calculated based upon RF predictions, that include the effects from terrain and ground clutter, and referenced to dBmW. Signal quality can be referenced as Signal to Noise and Interference Ratio (SINR), Reference Symbol Received Quality (RSRQ), etc. The Maximum Downlink and Uplink throughputs shall reference the maximum throughput the given BSL can receive given the signal quality and signal intensity calculated. A lookup table is typically provided by the manufacturer. Do not provide provisioned throughput.
Uplink MCS table Downlink MCS table	Uplink and Downlink MCS Tables are typically provided by the manufacturer. They relate throughput to signal quality and intensity. Each modulation type is provided as an individual row in the sheet.

New Templates- ULFW Logical Diagram

Unlicensed Fixed Wireless Evidence Submission – Logical Network Diagram

New Templates- ULFW Network Assumptions

Unlicensed Fixed Wireless Evidence Submission – Network Assumptions

Unlicensed Fixed Wireless Design – Network Assumptions	
General	
Maximum downlink user throughput (Mbps)	
Maximum uplink user throughput (Mbps)	
Maximum latency of the network (milliseconds)	
Maximum coverage distance (mi)	
Design network availability per month (%)	
Design oversubscription percentage	
For TDD channels: DL to UL channel ratio	
	Network-Specific
Radio Access Network (RAN) manufacturer	
Maximum number of MIMO layers supported	
Beamforming mechanism/technique and expected capacity gains used to improve throughput and capacity	
Carrier aggregation techniques to improve throughput and capacity	

New Templates- ULFW Tower Sites

Unlicensed Fixed Wireless Evidence Submission – Tower Sites

Site Name	Latitude	Longitude	Elevation	Address Line1	Address Line2	Address Line3	Backhaul Type	Backhaul Capacity (Mbps)	Structure Type	Call Signs for FCC Licenses	Existing or New Tower

New Templates- ULFW Sectors

Unlicensed Fixed Wireless Evidence Submission - Sectors

Sector ID (to Match the ID in the Data File)	Name of Parent Site (the Site Name as Referenced in the Tower Site Tab)	Radio Make and Model Number	Transmit Antenna Gain (dBi)	Transmit Antenna Height (Feet)	Antenna Pointing Azimuth (Referenced to True North)	Antenna Down Tilt (Electrical or Mechanical in Degrees)	Ant

New Templates- ULFW BSLs

Unlicensed Fixed Wireless Evidence Submission - BSLs

FCC/NTIA Location ID	Elevation (feet)	CPE Make and Model	CPE EIRP (dBm)	Losses from CPE Unit to CPE Antenna (dB)	CPE Antenna Gain (dBi)	Indoor or Outdoor Installation	Si

New Templates- ULFW Uplink MSC Table

Unlicensed Fixed Wireless Evidence Submission – Uplink MCS Table

Modulation Type	Channel Bandwidth	Signal Quality (e.g., RSRQ, SNR) (dB)	Corresponding Signal Intensity (e.g., RSRP, Received Power) (dBm)	Corresponding Throughput (Mbps)

New Templates- ULFW Downlink MSC Table

Unlicensed Fixed Wireless Evidence Submission – Downlink MCS Table

Modulation Type	Channel Bandwidth	Signal Quality (e.g., RSRQ, SNR) (dB)	Corresponding Signal Intensity (e.g., RSRP, Received Power) (dBm)	Corresponding Throughput (Mbps)

New Templates- LFW

Licensed Fixed Wireless Evidence Submission

- Excel worksheet, eight tabs
  - Instructions
  - Logical network diagram
  - Network assumptions
  - Tower sites
  - Sectors
  - BSLs
  - Uplink MCS Table
  - Downlink MCS Table

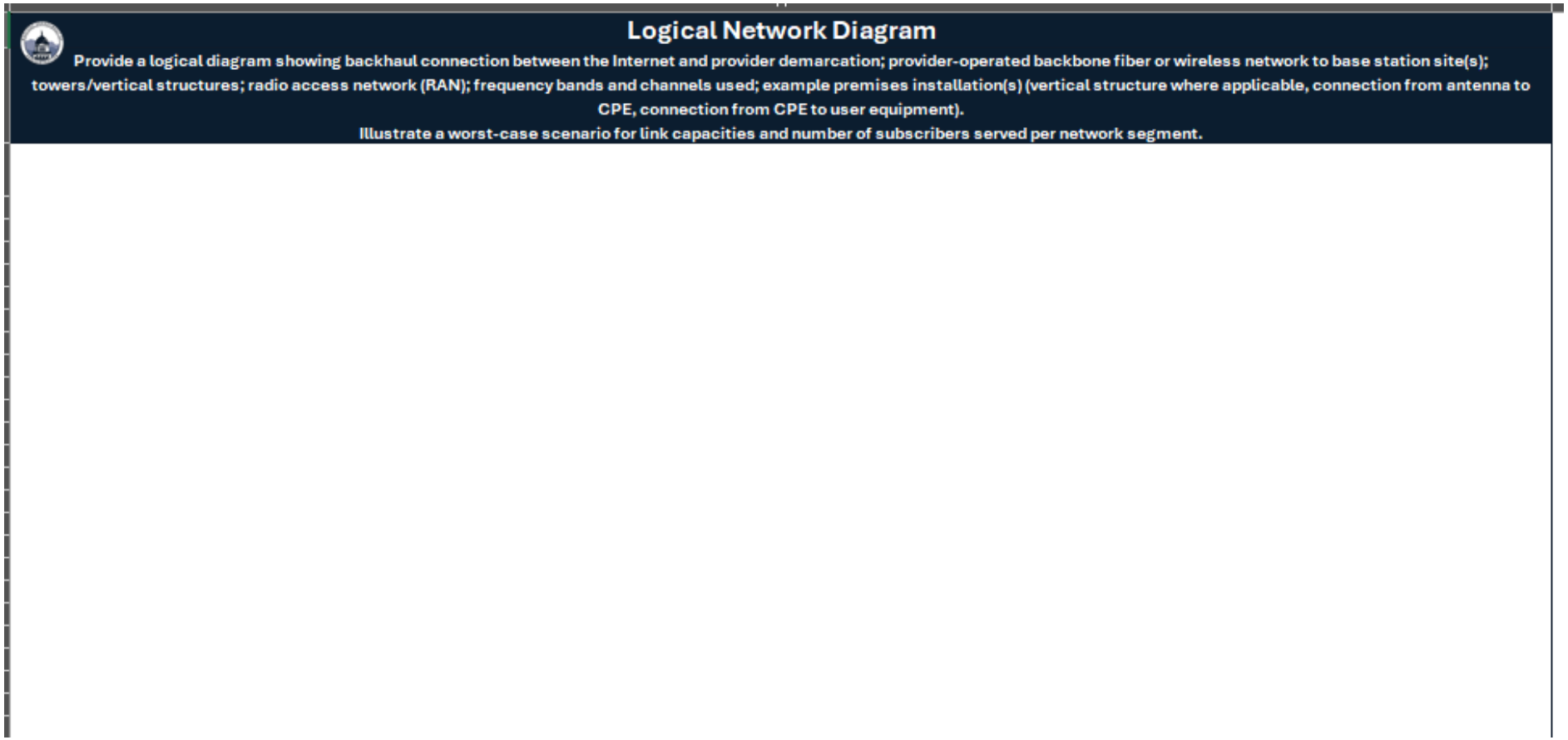
New Templates- FW Instructions

Licensed Fixed Wireless Evidence Submission – Instructions

Licensed Fixed Wireless Evidence Submission Template – Instructions	
Below are instructions to properly complete this form. Each tab must be completed in full. For additional information regarding the details that must be provided for each field in this spreadsheet, please refer to the Licensed Fixed Wireless Service Evidence Template Schema that is provided in the Instruction Manual.	
Tab Name	**Tab Instructions**
Logical Network 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.
Network Assumptions	Network assumptions are details of typical global parameters used in the network design as should be specified.
Tower Sites	Each site in the network must be designated by an individual row in the table. The site name, which is specifically a unique name for a given site, is its location described by latitude and longitude in decimal coordinates projected to NAD83 datum. An address should be included for each site. The structure type is a description of the tower, such as monopole or guyed tower. The backhaul type parameter should be described as the technology and medium used such as fiber, wireless, coax, etc. The capacity of the backhaul is described in Megabits Per Second (Mbps).
Sectors	Each sector in the network must be designated by an individual row in the table. The sector ID must be a unique name for a given sector. That sector must belong to a parent site in the previous sheet. The transmit antenna parameters are described in decibels referenced to a milliwatt (dBmW). Antenna gain is in reference to an isotropic antenna. The operating band is the name describing the frequency band in use such as CBRS, BRS/EBS, etc. The bandwidth is the total bandwidth in use at the given sector antenna. The duplexing is described as either Time Divisional Duplexing (TDD) or Frequency Division Duplexing (FDD).
BSLs (Broadband Serviceable Locations)	A Broadband Serviceable Location (BSL) is a business or residential location in the United States where mass-market fixed broadband internet access service is, or can be, installed. It's essentially a point on a map representing a location that the FCC deems eligible for broadband service. Each BSL in the network must be designated by an individual row in the table. The physical location, either indoor or outdoor, of the customer premises equipment (CPE) must be provided. The BSL must belong to a parent sector ("Serving Sector ID"), and the CPE antenna parameters are described in decibels referenced to a milliwatt (dBmW). Antenna gain is in reference to an isotropic antenna. The signal intensity is typically known as the received power or reference symbol received power and shall be calculated based upon RF predictions, that include the effects from terrain and ground clutter, and referenced to dBmW. Signal quality can be referenced as Signal to Noise and Interference Ratio (SINR), Reference Symbol Received Quality (RSRQ), etc. The Maximum Downlink and Uplink throughputs shall reference the maximum throughput the given BSL can receive given the signal quality and signal intensity calculated. A lookup table is typically provided by the manufacturer. Do not provide provisioned throughput.
Uplink MCS table Downlink MCS table	Uplink and Downlink MCS Tables are typically provided by the manufacturer. They relate throughput to signal quality and intensity. Each modulation type is provided as an individual row in the sheet.

New Templates- LFW Logical Network Diagram

Licensed Fixed Wireless Evidence Submission – Logical Network Diagram



New Templates- LFW Network Assumptions

Licensed Fixed Wireless Evidence Submission – Network Assumptions

Licensed Fixed Wireless Design – Network Assumptions	
General	
Maximum downlink user throughput (Mbps)	
Maximum uplink user throughput (Mbps)	
Maximum latency of the network (milliseconds)	
Maximum coverage distance (mi)	
Design network availability per month (%)	
Design oversubscription percentage	
For TDD channels: DL to UL channel ratio	
Network-Specific	
Radio Access Network (RAN) manufacturer	
Maximum number of MIMO layers supported	
Beamforming mechanism/technique and expected capacity gains used to improve throughput and capacity	
Carrier aggregation techniques to improve throughput and capacity	
Description of security to prevent unauthorized devices and users from having access to the network	
Description of user prioritization	

New Templates- LFW Tower Sites

Licensed Fixed Wireless Evidence Submission – Tower Sites

Site Name	Latitude	Longitude	Elevation	Address Line1	Address Line2	Address Line3	Backhaul Type	Backhaul Capacity (Mbps)	Structure Type	Call Signs for FCC Licenses	Existing or New Tower

New Templates- LFW Sectors

Licensed Fixed Wireless Evidence Submission – Sectors

Sector ID (to Match the ID in the Data File)	Name of Parent Site (the Site Name as Referenced in the Tower Site Tab)	Radio Make and Model Number	Transmit Antenna Gain (dBi)	Transmit Antenna Height (Feet)	Antenna Pointing Azimuth (Referenced to true north)	Antenna Down Tilt (Electrical or Mechanical in Degrees)

New Templates- LFW BLSs

Licensed Fixed Wireless Evidence Submission – BSLs

FCC/NTIA Location ID	Elevation (feet)	CPE Make and Model	CPE EIRP (dBm)	Losses from CPE Unit to CPE Antenna (dB)	CPE Antenna Gain (dBi)	Indoor or Outdoor Installation

New Templates- LFW Uplink MCS Table

Licensed Fixed Wireless Evidence Submission – Uplink MCS Table

Modulation Type	Channel Bandwidth	Signal Quality (e.g., RSRQ, SNR) (dB)	Corresponding Signal Intensity (e.g., RSRP, Received Power) (dBm)	Corresponding Throughput (Mbps)

New Templates- LFW Downlink MSC Table

Licensed Fixed Wireless Evidence Submission – Downlink MCS Table

Modulation Type	Channel Bandwidth	Signal Quality (e.g., RSRQ, SNR) (dB)	Corresponding Signal Intensity (e.g., RSRP, Received Power) (dBm)	Corresponding Throughput (Mbps)