SPECTRUM OPPORTUNITIES

BROADBAND 101 INFORMATION

- Broadband Fundamentals Tutorial:

  www.fcc.gov/broadband-fundamentals-tutorial

- 2.5 GHz Website:

  www.fcc.gov/RuralTribalWindow

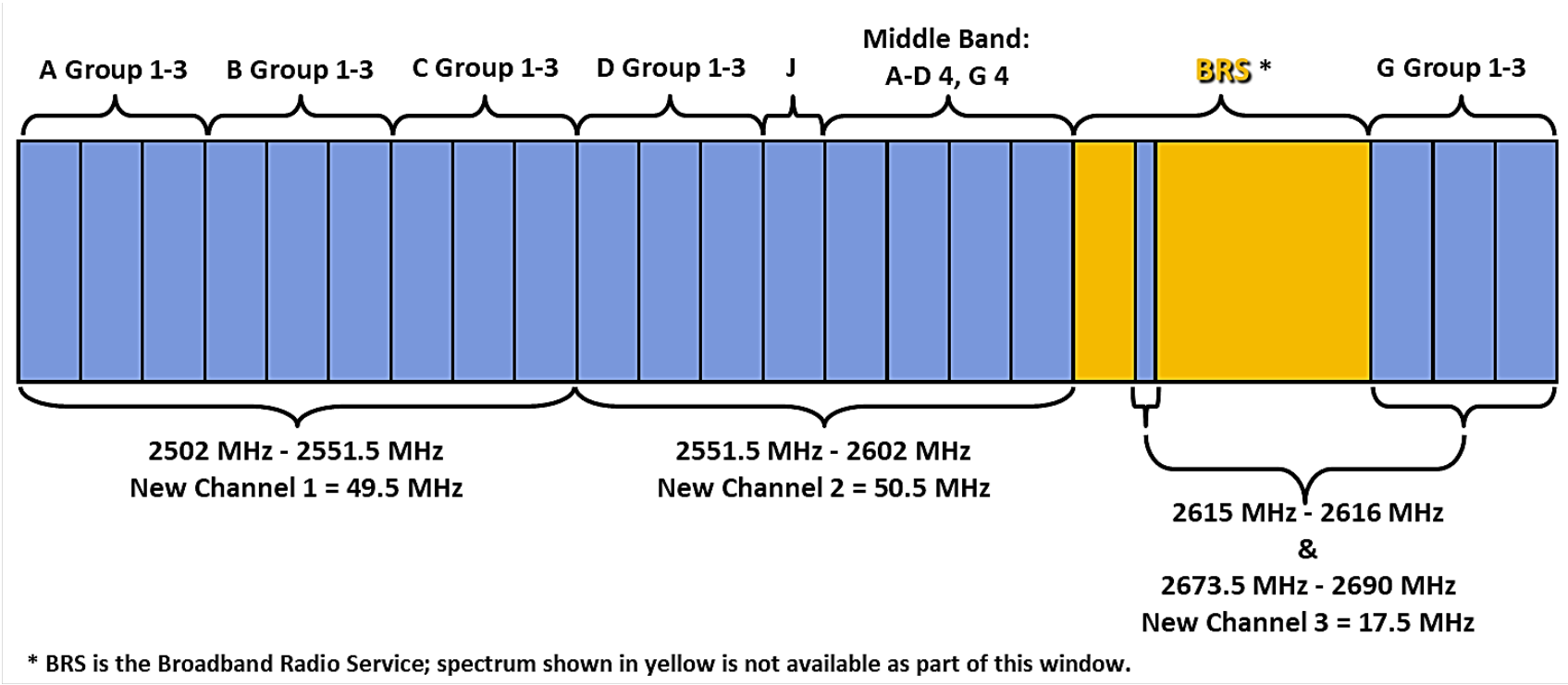
- Email Questions:

  RuralTribalWindow@fcc.gov

2.5 GHz BACKGROUND

- 117.5 MHz of spectrum in the 2.5 GHz band, formerly known as EBS, or Educational Broadband Service
- Historically used for instructional video broadcasts within school districts or other educational entities
- Transitioned to broadband use starting in 2004
- In July 2019, the FCC decided to remove the eligibility restrictions, establishing open eligibility to access this band
- Before unassigned areas of this band are auctioned, rural Tribal Nations will have the opportunity to apply for licenses

THE 2.5 GHz BAND PLAN



* BRS is the Broadband Radio Service; spectrum shown in yellow is not available as part of this window.

WHAT CAN 2.5 GHz SPECTRUM DO?

- 2.5 GHz spectrum is currently used to provide broadband services across the country, through a variety of mechanisms depending on the licensee
- Some educational licensees have used 2.5 GHz spectrum to build their own broadband networks
- Most licensees also lease parts of their licenses to commercial providers
- Because of this existing use, equipment compatible with 2.5 GHz spectrum is readily available “off the shelf” from a variety of vendors nationwide

WHAT CAN 2.5 GHz SPECTRUM DO?

- Supports broadband in rural areas
- Higher power limits and lower frequency than other available spectrum (unlicensed, 3.5 GHz) means better propagation and fewer base stations, lowering deployment costs
- For example, the increased power limits under the FCC's rules could allow a network using 2.5 GHz spectrum to achieve up to 20 times the area coverage, vs 2.4 GHz unlicensed spectrum, with the same number of transmitters
- Increased propagation vs higher frequency spectrum bands means that 2.5 GHz signals will penetrate better through walls and foliage, increasing service quality in forested areas and indoor/outdoor deployment scenarios

THE POWER OF 2.5 GHz

Nisqually Tribe

- Located in rural Washington State
- Obtained 2.5 GHz spectrum via waiver in 2013
- Sought spectrum to enhance educational offerings, including access to online classes at K-12 and university levels
- Currently offers free internet connectivity to Tribal members via WiMax

THE POWER OF 2.5 GHz

Havasupai Tribe

- Located in Supai, Arizona, on the floor of the Grand Canyon
- Received a waiver to build a network with 2.5 GHz spectrum in 2018
- Partnered with MuralNet, a nonprofit that facilitates rural network deployment by providing engineering expertise and solutions
- Deployed its network within weeks of gaining access to spectrum
- Currently, the Havasupai network provides online classes for students and continuing education for teachers
- A remote charter high school is also planned

GAINING ACCESS:
THE TRIBAL PRIORITY WINDOW

WHAT IS AVAILABLE?

- Three channels: two of roughly 50 MHz, and one of 17.5 MHz
- Tribal Applicants may apply for any spectrum that is not currently licensed to another entity, up to the entire band
- For comparison, a typical LTE channel is 10 MHz or 20 MHz of spectrum
- Tribes may define their own desired license area on their Tribal land, subject to some limitations

WHERE IS 2.5 GHz SPECTRUM AVAILABLE?

- Eligible Tribal Lands
  - Rural reservation lands, including former reservations in Oklahoma
  - Rural Alaska Native Village statistical areas and Rural Alaska Regional Corporation lands
  - Rural Hawaiian homelands

WHERE IS 2.5 GHz SPECTRUM AVAILABLE?

- Current licenses cover about 85% of the US population, but only about 50% of the land area
- This spectrum is more widely available west of the Mississippi, and in rural or remote areas
- Some areas may have some channels available even though a current licensee holds other channels
- To explore availability in your area, you can use the FCC's Universal Licensing System (ULS), which has mapping capabilities
- The FCC has also developed a mapping tool to help Tribes identify their eligible area and available spectrum

FCC FORM 602 – OWNERSHIP FORM

- Every applicant must have an FCC Form 602 on file in order to have their license application granted
- The Form 602 must be filed before the window closes
- If the applicant is a Tribal entity, the applicant should complete the main form and provide an exhibit to the Form 602 that includes the name, address and title of all members of the Tribe's governing council
  - If the applicant is a consortium, it should include this information for each member of the consortium
- Corporate and partnership entities should follow the form instructions
- For more detail, see Section 1.2112 of the Commission's rules

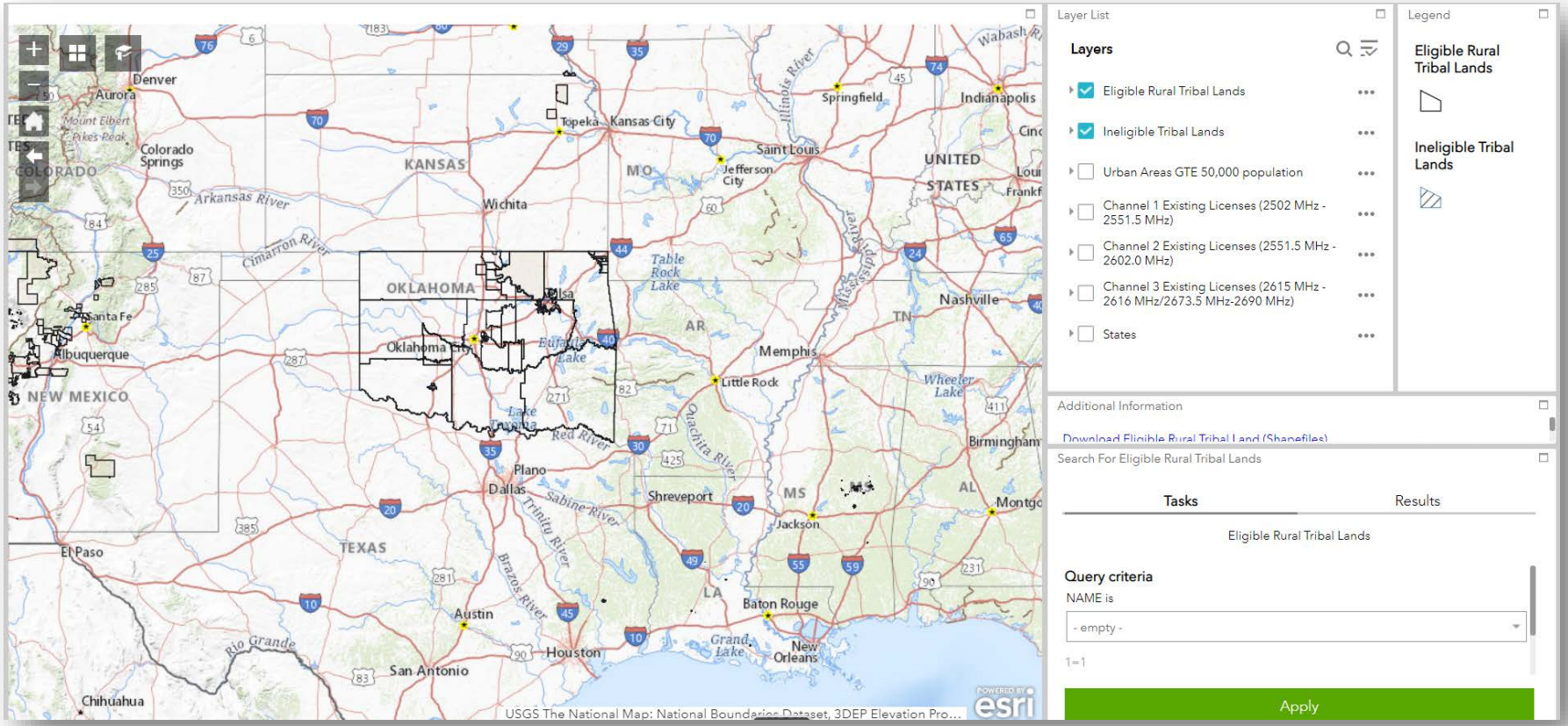
PUBLIC NOTICE

- All applications will become publicly available in ULS when they are filed
- After the window closes, applications will be reviewed for completeness and put on Public Notice as accepted for filing, at which time petitions to deny may be filed
- Applicants may be permitted to make minor amendments to their applications after the window closes, but applicants will NOT be permitted to make major amendments, such as adding channels or Tribal areas after the window closes; be sure your application is COMPLETE and SUBMITTED before the window closes on August 3, 2020 at 6:00 PM EDT

MUTUAL EXCLUSIVITY

- Applications will be considered mutually exclusive if there is any geographic or spectral overlap between them
- The FCC is statutorily required to resolve mutual exclusivity through competitive bidding for that spectrum
- 90 Day Settlement Window
- Mutually exclusive applications remaining at the end of the Settlement Window will be subject to competitive bidding and the FCC's anti-collusion rules will apply, which prohibit the applicants from engaging in any further communication

MAPPING TOOL DEMONSTRATION



3.5 GHz BAND

IMPORTANCE OF 3.5 GHz BAND

- Desirable combination of coverage and capacity
- Low-cost entry point to mid-band spectrum
- Attractive propagation and channel width for rural areas
- Key opportunity for deployment of advanced wireless services to Tribal areas

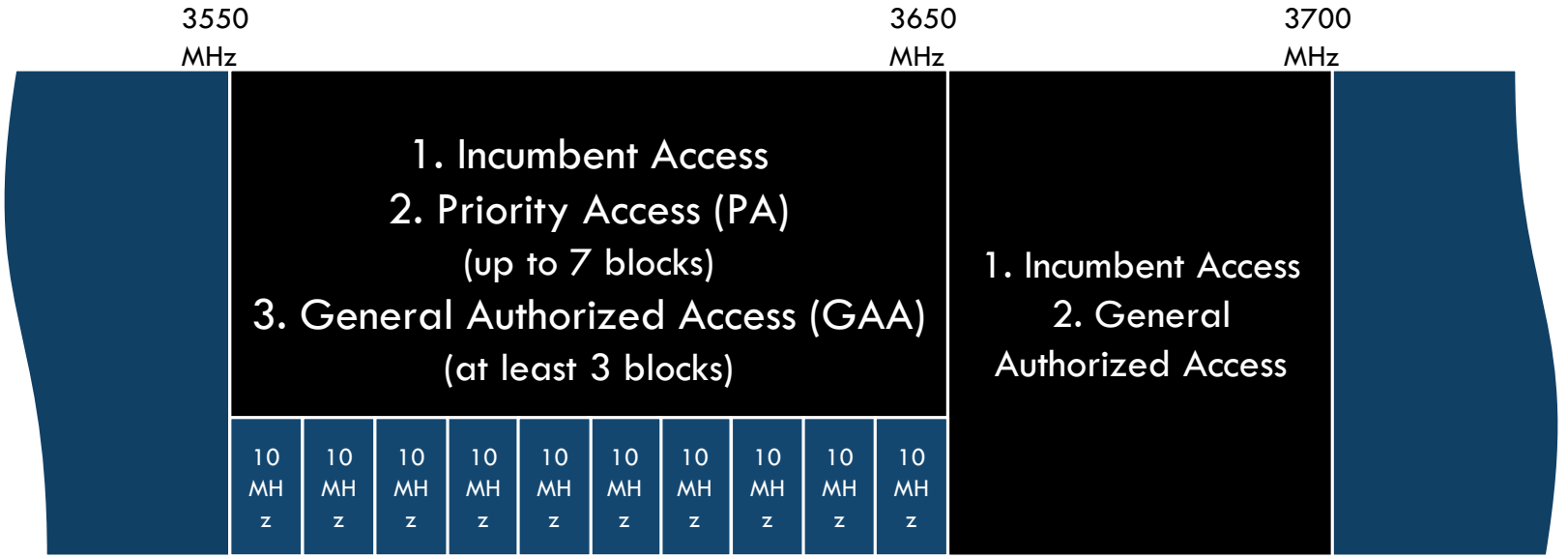
POSSIBLE USE CASES FOR 3.5 GHZ BAND

- Flexible operating rules allow for a wide variety of potential use cases, including:
  - Wireless broadband access
  - 5G services
  - Internet of Things
  - Intelligent manufacturing
  - Wireless backhaul

ACCESS TO 3.5 GHZ BAND

- Three-tier authorization model
  - Incumbent Access (federal government, incumbent FSS, grandfathered licensees)
  - Priority Access Licenses (subject to competitive bidding)
  - General Authorized Access (licensed by rule; non-exclusive access)
- Access to the band is coordinated by Spectrum Access Systems
  - The Commission has authorized four SASs to begin full commercial operations with more in the testing and application phase
  - Each SAS has authority to coordinate operations nationwide

3.5 GHZ BAND PLAN



Block configuration varies by county

- Each PAL and GAA block is a generic 10 MHz channel in the 3550-3650 MHz portion of the band
- No more than seven PALs will be issued in any county
- At least 80 MHz available to GAA users in any given county

DIFFERENCES BETWEEN PALS AND GAA

Priority access Licenses (PALs)

- 10 megahertz unpaired channels within the 3550-3650 MHz band
- Licensed by auction for a ten-year renewable term on a county-by-county basis
- No more than seven licenses will be issued in any county
- Substantial service requirement at the end of the license term
- Tribal lands bidding credit

General authorized access (GAA)

- Operations in the 3550-3700 MHz band
- Licensed by rule
- At least 80 megahertz in any given county available to GAA users
- Can operate on any “unused” Priority Access License channels
- Non-exclusive use

OPERATIONAL CONSIDERATIONS

- Prior to Operations
  - Priority Access Licenses and General Authorized Access Users must register fixed stations or networks with one of the authorized Spectrum Access Systems
  - The Spectrum Access System must authorize base stations prior to operation
  - Certain base stations must be installed by a certified professional installer
- During Operations
  - Registered base stations must comply with instructions from the SAS (e.g., changes to frequency assignments and power levels)

NEXT STEPS

- Any party that wishes to begin operations in the 3.5 GHz band should:
  - Contact one or more SAS administrators to discuss availability, pricing, and other commercial considerations. A list of authorized SAS administrators is available at:

    www.fcc.gov/35-ghz-band-overview

  - Contact equipment vendors to discuss appropriate base station and end user device solutions. CBRS Alliance maintains a reference list of devices that have been certified by the FCC met their commercial certification standards at:

    https://www.cbrsalliance.org/certification

  - Familiarize themselves with the professional installation requirements and ensure that certified professional installers are available in their area. The Wireless Innovation Forum has certified multiple parties to provide certified professional installer training.

CONTACTS

Wireless Bureau contacts:

2.5 GHz Web Page: www.fcc.gov/RuralTribalWindow

3.5 GHz Web Page: www.fcc.gov/35-ghz-band-overview

E-mail: RuralTribalWindow@fcc.gov

2.5 GHz: Cecilia Sulhoff – 202-418-0587

3.5 GHz: Paul Powell – 202-418-1613

ONAP contact:

Susan Mort - 202-418-2429