

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of

Promoting Investment in the 3550-3700 MHz
Band;

Petitions for Rulemaking Regarding the
Citizens Broadband Radio Service

GN Docket No. 17-258

RM-11788 (Terminated)
RM-11789 (Terminated)

COMMENTS

UNION PACIFIC

before
the
Federal
Communications
Commission, I

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COMMENTS OF UNION PACIFIC

Union Pacific Corporation, parent company of Union Pacific Railroad Company (Union Pacific) and Breeze Broadband Communications, Inc. (Breeze Broadband), appreciates this opportunity to submit comment in response to the Federal Communications Commission's (Commission) Notice of Proposed Rulemaking in the above-captioned docket (NPRM), seeking comment on several proposed changes to the recently adopted rules governing, *inter alia*, Priority Access Licenses (PALs) to be issued in 3550-3700 MHz band (3.5 GHz band).

I. INTRODUCTION AND SUMMARY

While Union Pacific supports the Commission's efforts to make this underutilized spectrum available for 5G and other services, Union Pacific strongly advocates changes to the proposed rules to ensure that this vital spectrum remains viable and available for all uses, including the provision of broadband service to currently underserved areas and supporting communication networks essential for railroad safety, efficiency, and economic growth, consistent with Congressional mandates and the Commission's commitment to closing the rural digital divide and ensuring diverse access to and use of the 3.5 GHz band. Union Pacific respectfully requests that the Commission implement a longer, renewable PAL license term along with reasonable utilization-based performance requirements, but also requests that the Commission reaffirm census tracts as the appropriate geographic license area. Union Pacific further requests that the Commission allow secondary market transactions to help ensure diverse, efficient and intensive use of the 3.5 GHz band, though we caution the Commission not to rely on the secondary market as a replacement for smaller geographic license areas and robust competition. To minimize security risks and protect fair competition, Union Pacific requests that the Commission eliminate the requirement for public disclosure of Citizen Broadband Service Device (CBSD) registration information.

II. BACKGROUND

About Union Pacific

Union Pacific qualifies as a Critical Infrastructure Industry ("CII") under the Commission's rules.¹ Union Pacific owns and operates more than 32,000 miles of railroad track in 23 states across the western two-thirds of the United States, linking every major West Coast and Gulf Coast port, and passing tribal lands. Union Pacific also serves four major gateways to the east: Chicago, St. Louis, Memphis and New Orleans, is the primary rail connection between the U.S. and Mexico, and interchanges traffic with the Canadian rail system. Union Pacific connects communities – many of them rural – with resources, generating opportunity and supporting growth in the 23 states where we operate, and across the nation. Union Pacific creates economic value through returns generated for shareholders, employment for roughly 43,000 employees, the business we give suppliers, and the business opportunities, commercial relationships, and innovative ideas our railroad network makes possible. Union Pacific provides essential value to our roughly 10,000 customers by delivering products in a safe, reliable, and environmentally responsible manner.

About Breeze Broadband

A wholly owned subsidiary of Union Pacific Corporation, Breeze Broadband was created to leverage Union Pacific's existing communications capacity and extensive geographic reach to bring small cell, fixed wireless broadband internet access services to rural communities. To date, millions of Americans in communities distant from large metropolitan areas face limited options

¹ "Critical Infrastructure Industry" is defined in 47 C.F.R. § 90.7 as: "State, local government and nongovernment entities, including utilities, railroads, metropolitan transit systems, pipelines, private ambulances, volunteer fire departments, and not-for-profit organizations that offer emergency road services, providing private internal radio services provided these private internal radio services are used to protect safety of life, health, or property; and are not normally commercially available to the public."

when it comes to internet access. In fact, the Commission's 2016 Broadband Progress Report states that most rural communities still lack high-speed access. Breeze is building a network that delivers an affordable, reliable, high-speed connection to communities reserved by other providers. Utilizing a state-of-the-art network of fixed wireless technology, Breeze Broadband's mission is to reach areas of the country where, currently, access to broadband is unreliable or non-existent. Breeze Broadband is positioned to fill that gap, providing a leading provider of fast, reliable fixed wireless internet service to rural and urban communities. Breeze's first market, in rural Iowa, went online May 30, 2017. Breeze intends to expand into other rural markets in the near future.

Filling Unmet Needs

The Commission's 2016 Broadband Progress Report confirmed that broadband access continues to lag in some areas, especially in rural areas and on tribal lands. The Commission reported, thirty-nine percent (39%) of rural Americans (23 million) lack access to 25 Mbps/3 Mbps broadband. By contrast, only four percent (4%) of urban Americans were reported to lack access to 25 Mbps/3 Mbps broadband. Even more concerning, the 2016 Broadband Progress Report confirmed that forty-one percent (41%) of American Indians on tribal lands (1.6 million people) and sixty-eight percent (68%) living in rural areas (1.3 million people) lack access to 25 Mbps/3 Mbps broadband. The Commission confirmed that these disparities do not reflect a lack of interest in broadband on the part of rural communities: "Americans living in rural and urban areas adopt broadband at similar rates if high-speed service is available, 28 percent in rural areas and 30 percent in urban areas."

The Commission noted that "[t]his Report concludes that more work must be done by the private and public sectors to expand robust broadband to all Americans the right way."

The Commission pledged to “continue working to accelerate broadband deployment and to remove barriers to infrastructure investment in part by direct subsidies, and in part by identifying and helping to reduce potential obstacles to deployment, construction, and adoption.”²

Viability Access to Spectrum Is Crucial

Union Pacific and Breeze Broadband are uniquely positioned to assist in meeting the Commission’s laudable goal of ensuring access for Americans in rural communities and on tribal lands to robust broadband connectivity. The “big four” wireless carriers, primary proponents of the NPRM rule changes, have failed to address the rural and tribal communities’ inadequate access to highspeed broadband internet connectivity. The carriers should not be permitted to hoard valuable spectrum across large geographic areas to the exclusion of providers ready, willing, and able to heed the Commission’s call to better serve underserved communities. At the same time, the Commission’s management of spectrum in the 3.5 GHz band should focus on supporting the viable commercialization of that spectrum, to maximize its use to meet the Commission’s public interest goals. Specifically, the Commission, in considering changes to the rules governing the 3.5 GHz band, must keep in sharp focus the requirements of Section 309(j)(3)(B) of the Telecommunications Act of 1996 to avoid excessive concentration of licenses and to disseminate licenses among a wide variety of applicants. Union Pacific believes these

² The 2016 Broadband Progress Report, and the Commission’s commitment, fulfill the mandate in Section 706 of the Telecommunications Act of 1996, which requires the Commission to report annually on whether advanced telecommunications capability “is being deployed to all Americans in a reasonable and timely fashion,” and to take “immediate action” if it is not. Congress defined advanced telecommunications capability as “high-speed” capability that allow users to “originate and receive high-quality voice, data, graphics, and video” services. Chairman Pai is quoted as saying: “Since my first day as Chairman of the FCC, I’ve said repeatedly that my number one priority is closing the digital divide and bringing the benefits of the Internet age to all Americans.”

goals can best be achieved through the longer license term proposed in the NPRM, but across narrower geographic areas.

Safety, Innovation and Economic Growth

The Union Pacific network is supported by an advanced communications network that includes, among other features, federally-mandated positive train control (PTC) for railroad safety. As a result, Union Pacific will have approximately 1,100 microwave towers, 10,500 PTC poles and more than 10,000 wayside sites installed at or near our right-of-way. As such, Union Pacific operates one of the largest private telecommunication networks in the U.S. Indeed, the safety, efficiency, and reliability of modern railroads rely on state-of-the-art communications networks.

Union Pacific must continue developing our communications network, which is essential for the safety, efficiency, and economic growth of our railroad. To meet these goals, however, access to spectrum will be crucial. Use of the reliable 3.5 GHz band for connected technology in railroad yards, intermodal facilities, and railroad right-of-way may be imperative.

Along our various right-of way, Union Pacific maintains automatic equipment identification systems, hot box detectors, wheel inspection systems, and other safety critical technology that communicate with our telecommunication network. In Union Pacific yards, communications are maintained through intricate cellular networks moving locomotives and other assets by utilizing remote control technology.³ In urban/industrial complexes, including intermodal facilities, dense concentration of wireless in unlicensed and unmanaged bands hampers critical communications. Union Pacific's access to the 3.5 GHz broadband and enhanced coverage would allow Union Pacific to deploy systems that support innovative, safe, productive and more efficient operations.

³ Currently in the 22.5 MHz band.

In addition, Union Pacific envisions the railroad industry initiative to adopt a unified approach for train coordination including locomotive wayside and locomotive-to-back-office communication, telemetry command and control operations. With access to the 3.5 GHz band, Union Pacific wishes about the investment and innovation in the railroad industry.

Between 2007-2016, Union Pacific invested approximately \$34 billion in our network and operations to support American transportation infrastructure. Connected technology in railroad operations and intermodal facilities could dramatically reduce congestion, increase safety, and reduce insurance costs for railroads and customers. Union Pacific's investment is in need of improved spectrum access to continue to innovate, empower and drive the American economy.

III. LICENSE TERMS & RESPONSIBILITY

Union Pacific supports the Commission's proposal to increase the PAL term to ten-years with an expectation of renewal, improved performance conditions are also adopted to ensure efficient and intensive use of the 3.5 GHz band. This approach will provide the necessary incentives to invest in PALs. Developing a network takes significant time and resources; a less than ten-year license term is not sufficient to ensure that licensees will be able to recover a return on investment. The current three-year PAL term with no renewal rights creates unreasonable risk and significantly undermines the incentives for providers to invest in utilizing the 3.5 GHz band. The potential availability of General Authorized Access ("GAA") spectrum, which may be unable to accommodate a fee licensee's operations, absent interference protection, is insufficient to mitigate this risk. Without a reasonable expectancy of PAL renewal, many potential bidders, including Union Pacific, will be less likely to invest in the 3.5 GHz band out of fear that investments will be stranded.

Additionally, the Commission should consider the needs of and risks to end users in setting term and renewability options. For example, many prospective PAL bidders have

indicated an intent to deploy commercial high-speed broadband to previously underserved populations, including rural and tribal areas. The Commission seeks to minimize the likelihood that a rural or tribal area service provider's PAL is reassigned to a new licensee that reallocate the spectrum away from the targeted customer base. Should a reallocation occur, the end users' current services will be returned to their underserved or underserved status. A longer form of renewal expectation is necessary to ensure that robust, sustainable services can be deployed. As further discussed below, geographic license areas smaller than Economic Areas (PEAs) and reasonable utilization requirements will also reduce the likelihood that subsequent PAL holders will reallocate the spectrum use away from a prior licensee's customer base.

As the Commission explained in the *Spectrum Frontiers* proceeding, such terms are particularly appropriate in bands where "new technology is still nascent and needs time to fully develop." For example, Bright Broadband plans to use short range antennas coupled with a robust fiber backbone to cost-effectively reach underserved and sparsely populated rural areas, a new use case for the 3.5 GHz spectrum. Additionally, Bright Broadband has a substantial interest in the outcome of this proceeding because we anticipate that the 3.5 GHz band as one means of supporting secure, mission-critical operations. Terms and renewal expectancy (with accompanying utilization and performance requirements) will afford licensees sufficient time to design and acquire the necessary equipment, including new technologies, and to deploy capabilities across the license area. Meeting the need for

longer PAL terms is consistent with the Commission's approach to spectrum bands, which will support mostly small cell networks.

By encouraging and facilitating substantial investment in new technologies in the 3.5 GHz band, ten-year PALs will promote robust competition for PALs among a diverse set of providers.

IV. GEOGRAPHIC LICENSE AREAS

Union Pacific believes that geographic license areas smaller than PEAs are imperative to enable smaller providers, new market entrants, and rural providers to effectively compete for PALs, and to ensure access to rural markets. At the same time, licensing areas should be small enough to ensure the efficient allocation of PALs, which would be undermined by a large geographic approach. Union Pacific supports preserving the existing census tract approach to geographic license areas.

License areas as large as PEAs are not necessary to stimulate investment and, in fact, are likely to deter or practically preclude investment in utilization of the 3.5 GHz band. Moreover, licensing by PEA could effectively preclude localized use, an outcome that would be unfortunate, given that the 3.5 GHz band is suited to small cell use. Small cell use is localized by design. If smaller providers are effectively precluded from competing for PEA-based PALs, the majority of the 3.5 GHz band will be captured by national cellular carriers that have not historically provided broadband services to remote populations, essential for 5G services. By allowing licensees to capture

for the 28 GHz and 37/39 GHz bands, like the 3.5 GHz band.⁴

and the development of new technologies, the ten-year renewal expectancy will foster

smaller than PEAs are imperative to rural and tribal communities and to customers in underserved areas. License areas should be small enough to ensure the efficient allocation of PALs, which would be undermined by a large geographic approach. Union Pacific supports preserving the existing census tract approach to geographic license areas.

License areas as large as PEAs are not necessary to stimulate investment and, in fact, are likely to deter or practically preclude investment in utilization of the 3.5 GHz band. Moreover, licensing by PEA could effectively preclude localized use, an outcome that would be unfortunate, given that the 3.5 GHz band is suited to small cell use. Small cell use is localized by design. If smaller providers are effectively precluded from competing for PEA-based PALs, the majority of the 3.5 GHz band will be captured by national cellular carriers that have not historically provided broadband services to remote populations, essential for 5G services. By allowing licensees to capture

⁴ See Report and Order and Further Notice of Proposed Rulemaking, *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services* ("Spectrum Above 24 GHz"), 31 FCC Rcd 8,014 (2016).

rural parts of many PEA-size PALs that contain urban centers are likely to go unserved. Such an outcome runs in direct conflict to the Commission's goals of "avoiding excessive concentration of licenses" and promoting the "efficient and intensive use of electromagnetic spectrum." 47 U.S.C. § 309(b) and (c).

A census tract approach to licenses areas will reduce barriers to entry and enable participation by smaller providers that lack the resources to bid for PEA-based licenses that extend beyond their service areas. Even if some smaller providers could afford to obtain a PAL on a PEA basis, PEAs are simply too large for most providers with business models focused on serving underserved rural and tribal communities. Once again, the likely result of PEA-based PALs will be that a large portion of certain PALs goes unserved. Additionally, the cost of holding a PAL over a larger geographic area than necessary likely will be passed along to end users.

A PEA licensing approach is not necessary to stimulate investment. Most PEA proponents, which have indicated plans to use the 3.5 GHz band opportunistically to augment services provided primarily in their low and other mid-band spectrum, will have the ability and resources to aggregate licenses to increase their coverage area across larger geographic areas if desired. Therefore, PEA proponents have a clear and workable alternative, and will not be unreasonably harmed, if the Commission preserves census tract PALs. Conversely, the alternatives for smaller providers without the resources necessary to obtain PEA-sized PALs are considerably fewer, and potentially nonexistent. Although the secondary market can offer relief to those advocating for a more granular approach even beyond census tracts, as noted below, the secondary market should not be relied upon to provide the only option for entry by many small providers, as would be the case if PALs were offered on a PEA basis. It would be unreasonable to

ask smaller players to undertake the burdens necessary to sell vast amounts of unused spectrum access in order to facilitate justify acquiring the PEA-based PAL necessary to achieve their targeted goals. The middle ground approach of maintaining census tract PALs with the ability to aggregate will further the Commission's goals by ensuring the efficient allocation of PALs for a diversity of deployment models and use cases.

Finally, there is no support in the record for the claim that the number of available PALs resulting from a census tract approach will unduly burden the Commission or the Spectrum Access System ("SAS") administrator. For example, SAS operations protect users from interference based on the actual location and coverage of transmitters, not license boundaries; thus, the complexity and effectiveness of such operations is largely disconnected from PAL boundaries.

The Commission should avoid creating unnecessary barriers to entry for new service providers that would flow from the large geographic license areas proposed in the NPRM. A census tract level auction will improve, without harm, focused, efficient and effective investment.

V. SECONDARY MARKETS

While Union Pacific generally supports allowing and encouraging secondary market transactions to help ensure that PAL spectrum rights flow to their best use and support a wide variety of deployments, particularly if the Commission adopts a longer license term, we do not recognize that anything in the current Commission record supports the presumption that large bidders are likely to make any, let alone a sufficient amount of, excess spectrum available to smaller players on the secondary market. Thus, Union Pacific opposes the concept of secondary market transactions as a replacement for smaller geographic areas and robust competition. As noted above, Union Pacific believes that fostering direct competition for PALs among a diverse pool of bidders by retaining census tract geographic license areas and increasing the PAL term

ten years with an expectation of renewal will better serve the Commission's goals of innovation and diversity than relying on a potentially unavailable secondary market.

VI. PERFORMANCE REQUIREMENT AND RENEWAL STANDARDS

Union Pacific supports reasonable utilization-based performance requirements and renewal standards to prevent the stockpiling and warehousing of spectrum and to ensure broadband buildout in rural markets.⁵ For example, requirements similar to the construction requirements set forth in 47 C.F.R. § 1.414 and/or new service-based requirements demonstrating the use of the spectrum to serve previously underserved customers or for innovative technologies would be appropriate. These reasonable utilization-based performance requirements will also incentivize PAL licensees to engage in secondary market transactions, which will further the Commission's goal of ensuring the efficient and innovative use of the 3.5 GHz band.

VII. SAS PUBLIC DISCLOSURE OF CONFIGURATION INFORMATION AND REGISTRATION INFORMATION

Union Pacific agrees that CBSD registration information that could result in a security risk or a competitive disadvantage to any party, or disincentivize participation, should be protected from public disclosure. Competitively-sensitive deployment plans should not be required to be publicly disclosed. Further, as noted by AT&T, "the SAS will be required to collect extensive data regarding users' network configuration, uses, and technical parameters" – data that "amounts to critical infrastructure data" that must be adequately protected to avoid competitive and cybersecurity concerns. AT&T Comments at 11.

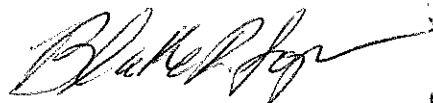
⁵ 47 U.S.C. § 309(j)(3)-(4) (requiring the Commission to design a system of competitive bidding that promotes economic opportunity and "the efficient and intensive use of the electromagnetic spectrum," and prescribe regulations that include performance requirements, such as appropriate deadlines and penalties for performance failures . . . [and] prevent stockpiling or warehousing").

In order to safeguard private information and protect critical infrastructure supports eliminating the requirement for public disclosure of CBSD registration data. Instead, the Commission should apply the same standards of protection used for other critical infrastructure. Additionally, Union Pacific also supports AT&T's proposal to consider a requirement that the SAS Administrator maintain registration data and use the data only for SAS functions (such as spectrum assignment and management).

VIII. CONCLUSION

For the foregoing reasons, Union Pacific respectfully requests that the Commission reaffirm census tracts as the appropriate geographic license area for PALs in the secondary market, and implement a longer, renewable PAL license term and reasonable utilization requirements. Together, these parameters will best ensure that spectrum is not excessively concentrated in the hands of a small number of existing licensees, promoting efficient and intensive use of the spectrum to deploy new technologies in underserved communities. We ask, further, that the Commission protect confidential information and competitively sensitive details submitted to the SAS Administrator.

Respectfully submitted,



Blake R. Loper
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December 28, 2017

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