Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Review of the Commission's Rules Governing the 896-901/935-940 MHz Band	)	WT Docket No. 17-200
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To: The Commission

COMMENTS
OF
PDVWIRELESS, INC.

Respectfully submitted,

PDVWIRELESS, INC.

By: _____

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May 30, 2019

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EXECUTIVE SUMMARY

American industry needs private broadband networks. That fact becomes clearer and more urgent each day. They need systems they can deploy where they need coverage; systems built to their elevated standards of reliability, resiliency, and security; systems that meet their cost-justification standards; systems to which they have immediate, non-preemptible access at all times, but particularly in emergency situations; systems they and only they control. They need to know in 2020 that the 900 MHz band will be available for this use so they are able to make decisions that impact their long-term strategic plans.

The FCC has taken a vital step toward addressing this demand by adopting a Notice of Proposed Rulemaking ("NPRM") to "create opportunities for robust broadband networks that fully support critical communication systems and that ensure the low latency and ultra-high reliability required by electric and other utilities, as well as other… spectrum users." pdvWireless, Inc. ("PDV") commends the Commission for proposing a 900 MHz band realignment that can ensure that this country, its industrial entities as well as its consumers, continue to lead the world in access to advanced wireless capabilities.

As described in the NPRM, the 900 MHz band is an ideal candidate for modernization through band realignment. Its rules have not been updated for more than 30 years, and too much of this spectrum remains woefully underutilized in large areas of the country. Modifying the rules to provide for both broadband and narrowband systems will allow users to choose which technology best suits their operational requirements, current and future. It will offer, for the first time, spectrum on which industrial entities may implement cost-effective LTE systems with the coverage, propagation, and capabilities required for American businesses, particularly those engaged in critical services such as electric utilities, pipelines, major manufacturing, and

transportation providers. PDV strongly supports the path laid out in the NPRM and urges the Commission to move quickly to adopt rules consistent with its proposal.

The urgency of the private broadband network need, in particular for electric utilities faced with the immediate task of grid modernization, is highlighted in recent, voluntary, collaborative efforts by key industry members through participation in the Utility Broadband Alliance ("UBBA"). UBBA describes its mission as assisting its members "in planning and deploying secure, reliable, and resilient private broadband networks to support America's transforming digital grid." Its members include Ameren Services Company, Evergy, Inc., National Grid, Southern Linc, and Xcel Energy, as well as 4RF, Burns & McDonnell, Inc., Cisco Systems, Inc., Council Rock, Encore Networks, Inc., Ericsson, Inc., Federated Wireless, Inc., General Electric Company, Motorola Solutions, Inc., Multi-Tech Systems, Inc., pdvWireless, Inc., Sierra Wireless, Inc., Sonim Technologies, Inc., and Tait Communications.

A number of these entities also are involved in a DOE National Renewable Energy Laboratory ("NREL") project to analyze the performance of private LTE broadband networks on Advanced Distribution Management System ("ADMS") deployments and to "accelerate the development and validation of innovative approaches to enhance the resilience of distribution systems, including microgrids, with high penetration of distributed energy resources." NREL has partnered with PDV in this undertaking, a project DOE has awarded "high-impact" status, a classification given to projects expected to accelerate innovation in the private sector in developing scalable technologies consistent with DOE's Grid Modernization Initiative. The Industry Advisory Board for the project is comprised of six leading utilities that provide service across 18 states: Consumers Energy Company, Duke Energy Corporation, Evergy, Inc., Eversource Energy, Hawaiian Electric Company, Holy Cross Energy, and Xcel Energy, Inc. Industry board members

review and help develop key test scenarios to ensure that procedures accurately reflect the use cases critical to the utility market. The testing will be conducted using an experimental authorization issued to PDV, but a permanent spectrum home in the 900 MHz Band is needed to support actual grid modernization. The participation of these entities underscores both the criticality and time-sensitivity of the utility industry's need for this spectrum solution.

PDV appreciates that all band repurposings require a balancing of interests. Incumbent operations must be protected even as their facilities are modified to allow the introduction of newer, more advanced technologies. The NPRM sets out a carefully calibrated transition approach for the 900 MHz band, one that will allow incumbent licensees to maintain narrowband facilities if they are best-suited for their operating requirements, while offering a broadband option for those whose needs demand the capabilities and cost efficiencies of technology with a global ecosystem of devices and applications. Relocating the operations of freight railroads, pursuant to the nationwide 900 MHz authorization held by the Association of American Railroads, will require particular attention; but PDV is confident that the FCC will recognize the unique character of AAR's operations and provide appropriate relief.

PDV agrees that the exchange process whereby frequencies in the broadband segment are exchanged for those in the narrowband segments should proceed on a voluntary basis whenever possible. But as the Commission has recognized in the NPRM, there also must be a process for addressing the "holdout" problem. A purely voluntary relocation approach would allow a single incumbent holding a license for a single 12.5 kilohertz frequency at a single site – a license that it acquired for the *de minimis* cost of frequency coordination and an FCC filing fee – to thwart the Commission's determination that a broadband option would serve the public interest. That cannot be the intended outcome of the FCC's efforts. There must be a mechanism to resolve such

situations. PDV believes the proposed "success threshold" that would trigger mandatory relocation for remaining incumbents once a broadband applicant achieved a defined level of success in voluntary negotiations would be the fastest and most efficient way to achieve full clearing of the broadband segment. While overlay auctions in counties with remaining incumbents might produce the same result over time, this would not appear to be the best use of FCC competitive bidding resources given its commitment to auctioning much larger allocations in support of its 5G FAST plan.

Achieving the objectives set out in the NPRM will require the Commission to include the 900 MHz band spectrum it has in inventory, often for several decades, as part of the broadband segment or as replacement spectrum for relocating incumbents. That the FCC has the authority to contribute its spectrum for this purpose, rather than assigning it pursuant to competitive bidding, is not subject to debate. The Commission has broad discretion in determining how to make spectrum available to serve the public interest, discretion it has exercised in the past and should do so in this instance.

PDV generally supports the licensing, technical, and operational rules proposed by the FCC. While some fine-tuning may be appropriate, the rules as proposed already provide a highly workable framework for implementing a 900 MHz broadband option consistent with the Commission's avowed intention to "unlock the full potential of broadband and its applications."

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COMMENTS
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PDVWIRELESS, INC.

pdvWireless, Inc. ("PDV" or "Company")[1] is pleased to submit these Comments in response to the Federal Communications Commission ("FCC" or "Commission") Notice of Proposed Rulemaking.[2] The NPRM proposes to realign the 896-901/935-940 MHz band ("900 MHz Band") to "create opportunities for robust broadband networks that fully support critical communication systems and that ensure the low latency and ultra-high reliability required by electric and other utilities, as well as other… spectrum users."[3]

The timing of the FCC's proposal is more than propitious. Since the Commission began examining the optimal use of the 900 MHz Band, many of the nation's industries, in particular its electric utilities, have identified an increasingly urgent requirement for spectrum on which they can deploy private broadband networks. Adoption of this proposal will allow the FCC to help American industry forge a broadband course in parallel with the Commission's commitment to

[1] The Enterprise Wireless Alliance ("EWA") has filed jointly with PDV throughout the course of this proceeding, including the initial Petition for Rulemaking in RM-11738 (*see,* n. 23*),* but wished to take advantage of the full 60-day Comment period and will be filing its Comments separately.
[2] *Review of the Commission's Rules Governing the 896-901/935-940 MHz Band*, WT Docket No. 17-200, Notice of Proposed Rulemaking, 84 FR 12987 (Apr. 3, 2019) ("NPRM").
[3] *Id*. at ¶ 8.

deliver high-speed broadband to all citizens, whether urban or rural, through its 5G FAST plan initiative that includes the 900 MHz Band.[4] The country's industrial entities, as well as the American public that relies on the essential services they provide, will benefit from being able to "unlock the full potential of broadband and its applications."[5]

The NPRM represents another critical step by the Commission in maintaining America's leadership role in next-generation wireless connectivity. A 900 MHz broadband option will respond to the urgency expressed by parties that require private broadband networks to address immediate, essential operational requirements.[6] The path to secure, robust, reliable, resilient, private broadband networks that can support electric grid modernization, as well as advanced wireless connectivity for a variety of other essential industries, should begin with the realignment and modernization of the 900 MHz Band.[7]

PDV strongly supports the proposal outlined in the NPRM, including reliance whenever possible on a voluntary, market-driven transition process, and urges the Commission to move quickly to adopt rules consistent with its proposal.

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[4] *See* www fcc.gov\5G.
[5] NPRM at ¶ 7.
[6] *See, e.g.,* Letter from Donald J. Evans, Counsel to Southern California Edison ("SCE") to Marlene H. Dortch, Secretary, FCC, WT Docket No. 17-200, Attach 3 at 1 (filed Feb. 27, 2019) ("SCE Letter"); *see also* Ameren Missouri's Smart Energy Plan (Feb., 14, 2019) and *Ex Parte* Letter filed by Ameren Services Company and pdvWireless, Inc. (filed April 19, 2018) ("Ameren Letter").
[7] Private LTE networks are already being deployed around the world. Nokia has estimated that there are almost 15 million potential venues for private LTE systems, with the opportunity to upgrade to 5G. It views the largest market for private networking as industrial and manufacturing operations. A recent example is an agreement to bring broadband connectivity, automation, and intelligence to the Finnish port of Ukkoverkot. *See* Blackman, James. "Nokia and Ukkoverkot tie-up another private LTE deal with another Finnish port." enterprise iot insights, RCRWireless, (April 25, 2019), https://enterpriseiotinsights.com/20190425/channels/news/nokia-ties-up-another-private-lte-deal-with-another-port.

I THE URGENT NEED FOR INDUSTRIAL BROADBAND SPECTRUM IS DOCUMENTED AND ACCELERATING

The Commission, in concert with the Administration, is pursuing an ambitious program to ensure that the United States will lead the world in the development and deployment of advanced broadband technology. Winning this competition will position the United States to enjoy robust economic investment and strong growth in good-paying jobs well into the future. The Administration has recognized that success in this undertaking must come from the private sector, with the government providing support only when necessary to supplement market forces, but largely by ensuring that governmental regulations foster rather than inhibit investment and innovation.[8]

The FCC's commitment to modernize outdated regulations and deliver more flexible-use spectrum to the communications marketplace transcends bands and allows for a variety of technological advances:

> As demand for lower-speed data and legacy voice services declines, the Commission determined that its rules must be modified so that resources that could be used to expand next-generation networks and services aren't unnecessarily diverted to maintaining outdated infrastructure.[9]

The 900 MHz Band is a prime example of the Commission's focus on promoting these objectives across all spectrum allocations, including those that will allow industrial entities to enhance their operations through access to private broadband networks and thereby better serve their customers, the American public.

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[8] As stated by President Trump, joining with Chairman Pai in announcing the Rural Digital Opportunity Fund on April 12, 2019: "In the United States, our approach is private-sector driven and private-sector led. The government doesn't have to spend lots of money…. And leading through the government, we don't want to do that because it won't be nearly as good, nearly as fast."

[9] *See* Wigfield, Mark. "FCC Takes Additional Steps to Eliminate Needless Barriers to Next-Generation Networks and Services." FCC News, Federal Communications Commission (June 7, 2018), https://docs.fcc.gov/public/attachments/DOC-351389A1.pdf.

As described in the NPRM, the 900 MHz Band currently consists of 399 12.5 kilohertz narrowband frequency pairs. They are arranged in 40 groups of 10 contiguous frequencies that alternate between geographic Specialized Mobile Radio ("SMR") licenses purchased at auction[10] and site-based licenses authorized for Business/Industrial/Land Transportation ("B/ILT") use.[11] The rules governing this spectrum were adopted in 1986 and have not been updated substantively since then.[12] The only modernization was adopted almost 25 years ago when the FCC converted the 10-channel SMR blocks from site-based to geographic licenses through overlay auctions.[13] The band plan remains designed for narrowband usage with a nod toward wideband applications of up to 125 kilohertz if a B/ILT licensee is able to assemble 10 contiguous frequencies.[14] This regulatory stasis may have contributed to the underutilization of this spectrum. 900 MHz B/ILT frequencies are licensed extensively in certain parts of the country including most major markets, but remain underutilized or even entirely unused in too many parts of the nation.[15]

While narrowband private land mobile radio ("PLMR") systems serve certain essential functions today and likely will continue to do so into the future, the creative approach outlined in the NPRM demonstrates that narrowband versus broadband need not be a binary choice. All businesses, just as all consumers, need access to high-speed broadband capability. For industrial entities, in particular those providing critical infrastructure services, they need broadband where they operate, which may be outside the coverage area of commercial networks. They need it built to their demanding specifications for reliability, resiliency, and security that often exceed those needed to satisfy consumer requirements. They need it most during emergency situations when

[10] Auctioned SMR licenses are issued for Major Trading Areas ("MTAs").
[11] The uppermost B/ILT block includes only 9, not 10, channels.
[12] *See 900 MHz Reserve Band Allocation*, GN Docket No. 84-1233, Report and Order, 2 FCC Rcd 1825 (1986).
[13] *See 900 MHz SMR Allocation*, PR Docket No. 89-553. Second Report and Order and Second Further Notice of Proposed Rulemaking, 60 FR 21987 (1995).
[14] 47 C.F.R. §90.645(h).
[15] NPRM at ¶ 24.

commercial networks are least available, both for initiating communications by voice and for transmitting video and other data needed to support critical services.

Many factors are driving the demand for LTE broadband, including the same speed and enhanced capabilities that have made it essential to the consumer. But industrial entities, and utilities in particular, are responding to more existential concerns. The ever-escalating risk of attacks on the cybersecurity of the nation's electric grid compels a strengthening of the telecommunications networks, the "invisible infrastructure," on which that grid relies.[16] Private broadband networks, ones that are not tied to the Internet, will be an essential element in a secure, reliable electric grid, and will allow other industries to enjoy that same level of cybersecurity.

At the same time, utilities must contend with increasingly severe weather conditions that can threaten their ability to provide critical services to the American public. One of the most extreme examples is the forest fires that have swept through large swaths of the nation, in particular California, in recent years. Providers in those areas are at the forefront of the effort to harness broadband technology, rather than human resources, to identify dangers such as downed power lines so that the power is cut off automatically before they hit the ground, thereby greatly reducing the likelihood that the incident will spark a fire.[17]

For these reasons, the FCC has correctly proposed to introduce a broadband option in the 900 MHz Band while maintaining spectrum for narrowband operations. As stated in the NPRM:

> Most commenters support, at least in principle, the creation of a 900 MHz broadband service. They recognize that broadband is an effective tool for addressing the current and future communications needs of a wide range of the 900 MHz band users, and they agree that a broadband service targeted to B/ILT entities

[16] The Department of Energy ("DOE") reported that the first digital attack to interfere with electrical grid operations in the United States took place on March 5, 2019. The attack did not affect grid reliability or customer service, but demonstrated the vulnerability of all critical infrastructure to such attacks. *See* The Cybersecurity 202: "A cyberattack just disrupted grid operations in the U.S. But it could have been far worse." The Washington Post, May 6, 2019.

[17] *See* San Diego Gas & Electric Company's (U 902 E) Wildfire Mitigation Plan, R. 18-10-007, ("Order Instituting Rulemaking to Implement Electric Utility Wildfire Mitigation Plans Pursuant to Senate Bill 901 (2018)") (filed February 6, 2019).

> could provide the coverage and reliability that electric and other utilities require but cannot obtain from consumer-oriented commercial wireless carriers.[18]

The need for action is urgent. The vital importance of near-term usable 900 MHz broadband spectrum has been confirmed in a recent survey of electric utilities, which found that they require private networks to achieve the necessary reliability and coverage.[19] As stated in that report:

> Utilities need huge amounts of data from the field in order to make their power delivery more reliable and efficient. Telecommunications networks are essential to getting this critical data to the right place at the right time. Without reliable and sufficient bandwidth telecommunications, grid modernization is impossible.[20]

This accelerating demand prompted utilities and companies that support them to coalesce in an effort to drive scale and innovation in the development of dedicated wireless broadband networks through participation in the Utility Broadband Alliance ("UBBA"). UBBA describes its mission as assisting its members "in planning and deploying secure, reliable, and resilient private broadband networks to support America's transforming digital grid."[21] Its members include Ameren Services Company, Evergy, Inc., National Grid, Southern Linc, and Xcel Energy, as well as 4RF, Burns & McDonnell, Inc., Cisco Systems, Inc., Council Rock, Encore Networks, Inc., Ericsson, Inc., Federated Wireless, Inc., General Electric Company, Motorola Solutions, Inc., Multi-Tech Systems, Inc., pdvWireless, Inc., Sierra Wireless, Inc., Sonim Technologies, Inc., and Tait Communications.

A number of these entities also are involved in a DOE National Renewable Energy Laboratory ("NREL") project to analyze the performance of private LTE broadband networks on

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[18] NPRM at ¶ 5.
[19] Utility Network Baseline – April 2019 Update, Utilities Technology Council, https://utc.org/wp-content/uploads/2019/04/UTC-Utility-Network-Baseline-Final.0419.pdf.
[20] *Id*. at 3.
[21] Utility Industry Leaders Join New Alliance to Champion Private Broadband Networks for Critical Infrastructure, UBBA Press Release, Feb. 4, 2019; *see* www.UBBA.com.

Advanced Distribution Management Systems ("ADMS") deployments and to "accelerate the development and validation of innovative approaches to enhance the resilience of distribution systems, including microgrids, with high penetration of distributed energy resources."[22] NREL has partnered with PDV in this undertaking, a project DOE has awarded "high-impact" status, a classification given to projects expected to accelerate innovation in the private sector in developing scalable technologies consistent with DOE's Grid Modernization Initiative. The Industry Advisory Board for the project is comprised of seven leading utilities that provide service across 18 states: Consumers Energy Company, Duke Energy Corporation, Evergy, Inc., Eversource Energy, Hawaiian Electric Company, Holy Cross Energy, and Xcel Energy, Inc. Industry board members review and help develop key test scenarios to ensure that procedures accurately reflect the use cases critical to the utility market. The testing will be conducted using an experimental authorization issued to PDV, but a permanent spectrum home in the 900 MHz Band is needed to support actual grid modernization.

The FCC has an extensive record on the 900 MHz broadband issue. It received comments on the 2014 Petition for Rulemaking filed jointly by PDV and EWA proposing a 900 MHz Band realignment to provide a broadband option.[23] It received additional comments on the broadband rules proposed by EWA/PDV.[24] It received comments and reply comments in response to the Notice of Inquiry ("NOI") investigating what, if any, changes should be considered for the 900

[22] "U.S. Department of Energy Awards High-Impact Status to pdvWireless and National Renewal Energy Lab Project." PR Newswire, (February 7, 2019), https://www.prnewswire.com/news-releases/us-department-of-energy-awards-high-impact-status-to-pdvwireless-and-national-renewable-energy-lab-project-300791341 html.

[23] *See Wireless Telecommunications Bureau Seeks Comment on Enterprise Wireless Alliance and Pacific DataVision, Inc. Petition for Rulemaking Regarding Realignment of 900 MHz Spectrum*, Public Notice, 29 FCC Rcd 14424 (WTB MD 2014) ("EWA/PDV Petition").

[24] *See Wireless Telecommunications Bureau Seeks Comment on Supplement to Enterprise Wireless Alliance and Pacific DataVision, Inc. Petition for Rulemaking Regarding Realignment of 900 MHz Spectrum,* Public Notice, 30 FCC Rcd 4763 (WTB MD 2015).

MHz Band, including whether the EWA/PDV broadband proposal should be pursued.[25] The FCC is in a position now to move quickly to address the remaining issues raised in the NPRM and convert its proposal into rules that create a cost-effective broadband opportunity for America's industrial companies.

II THE PROPOSED 900 MHz BAND REALIGNMENT IS A BALANCED APPROACH FOR ADDRESSING WIRELESS NEEDS OF U.S. INDUSTRY

The NPRM proposes to adopt a 3/3 megahertz broadband segment at 897.5-900.5/936.5-939.5 MHz with the authorization awarded to a 900 MHz Broadband ("900 MHz BB") licensee ("BB Licensee") on a county-by-county basis pursuant to a licensing process described below. This bifurcation will allow for a 1.5/1.5 megahertz segment (896-897.5/935-936.5 MHz) below and a .5/.5 megahertz segment (900.5-901/939.5-940 MHz) above the broadband allocation for continued B/ILT and SMR narrowband use. Creating two narrowband segments is responsive to the concerns of some B/ILT licensees as it provides the opportunity to create separation between co-located frequencies in the frequency exchange process.[26] PDV intends to work with incumbents in optimizing their replacement frequency plans in this and all other respects.

The NPRM proposes a county-based geographic licensing area for 900 MHz BB licenses ("BB Licenses").[27] It notes that counties are being used in other bands and likely will align better with the service areas of utilities and other private enterprise users than would the larger areas that typically are awarded to commercial wireless entities. PDV agrees with the FCC's expectation that licensing by county will "help foster flexible and innovative use of the 900 MHz band in all

[25] *See Review of the Commission's Rules Governing the 896-901/935-940 MHz Band*, WT Docket No. 17-200, Notice of Inquiry, 32 FCC Rcd 6421 (2017).
[26] A number of B/ILT systems already are licensed for adjacent frequencies at a site suggesting that any associated issues are surmountable.
[27] NPRM at ¶ 22.

areas by providing a consistent, relatively small license size appropriate for a wide range of possible network deployments."[28] While no single defined area will coincide precisely with the coverage requirements of the myriad business users around the nation, counties represent the best combination of sufficient size to address a variety of mobile and fixed coverage needs while not being so large as to result in geographic overreach.

In response to the query in the NPRM,[29] PDV is not aware that any technical or operational rule changes would be required to enable B/ILT and SMR systems to operate compatibly in the narrowband segments. Systems operated by B/ILT and SMR entities co-exist in a number of Part 90 bands, including on adjacent channels in the same geographic area and on a co-channel basis in adjacent markets. Their operational characteristics generally are similar, and they use the same types of equipment. Their applications will continue to require prior frequency coordination by FCC-certified frequency advisory committees that ensure compliance with the FCC's technical requirements before submission to the FCC. To the extent the current rules have worked successfully for narrowband 900 MHz systems for several decades, there is no reason to think that will change as a result of the proposed band realignment.

The location of the proposed broadband segment deviates slightly from the EWA/PDV recommendation but has the advantage of not splitting any MTA license blocks, which the Company agrees may simplify the realignment process.[30] PDV must request one modification of the broadband segment definition. 3GPP standards require all LTE carriers to conform to a carrier center in integer multiples of 100 kHz; *i.e.* 938.0000, 938.1000, 938.2000 MHz. The proposed broadband segment of 936.5000-939.5000 MHz will have the carrier center at 938.0000 MHz.

[28] *Id*.
[29] *Id*. at ¶ 19.
[30] *Id*. at ¶ 16.

This requires that the broadband segment begin at 936.5000 MHz, channel 120, and end at 939.5000 MHz, channel 360, rather than beginning at channel 121 as indicated in footnote 38.

The NPRM notes that commenters such as SCE and Duke Energy Corporation suggested realigning the entire band to create a 5/5 megahertz broadband channel, the channel size they stated is needed to address their expanding needs.[31] That option is appealing from a technical and operational perspective. There is a geometric increase in capacity at little incremental cost when moving from a 3/3 to a 5/5 megahertz channel as the infrastructure costs remain relatively constant. This, in turn, reduces the per-device cost of supporting such a network. Increased capacity also allows for increased speed, which could be highly valuable for certain applications that are of particular importance to electric utilities and other industrial users.

However, clearing the entire 5/5 megahertz band would require identifying replacement spectrum that would qualify as comparable and could entail providing many narrowband incumbents with new equipment. This would include finding replacement spectrum for the freight railroads that, through the Association of American Railroads ("AAR"), hold an effectively nationwide authorization as discussed in Section IV(C) below. Thus, while a 5/5 megahertz option should be provided for in the rules, the Commission is correct in suggesting that its short-term achievability may be limited to areas where there are a small number of licensees with significant spectrum positions.[32] Since the capacity and other benefits of a 5/5 megahertz LTE channel are indisputable, PDV recommends that the Commission adopt a "success threshold" standard for acquiring such a license in those counties consistent with the approach under consideration in the NPRM for a 3/3 megahertz broadband license as discussed in Section III(A).[33]

[31] *Id*. at n. 48.
[32] *Id*. at ¶ 20.
[33] *Id*. at ¶ 48.

III THE TRANSITION PROCESS SHOULD PROMOTE BROADBAND AVAILABILITY IN A TIMEFRAME RESPONSIVE TO INDUSTRIAL REQUIREMENTS

The Commission has a statutory obligation to ensure that the spectrum it regulates serves the public interest.[34] This requires a re-evaluation of existing allocations and regulatory approaches as technology and use cases evolve:

> Spectrum allocations made by the FCC "can leave spectrum tied to outmoded and less valuable services. To accommodate new uses, [the] FCC often changes its rules to move spectrum from an existing use, a process known as repurposing. In making these decisions, [the] FCC considers uses that best serve the public interest, including factors such as economic and social value." [35]

In such instances, the FCC must balance its public interest mandate with the interests of incumbents that have investments in a band and a reliance on their communications systems in addressing operational requirements. In the 900 MHz Band, it must respond to the time-sensitive needs of industries seeking a broadband option, while respecting the challenges that can arise in relocating incumbents, in particular those with large, complex systems. The Commission has navigated these competing interests successfully in a number of allocations, and PDV is confident that the transition process set out in the NPRM will allow it to do so in the 900 MHz Band.

In considering the transition process, PDV urges the FCC to give appropriate weight to the speed by which various approaches promise to make 900 MHz broadband spectrum available for actual deployment. Commenters such as SCE have described the situation as extremely critical:

> …SCE shares the view expressed by many commenters to date that there is an urgent need for improved and expanded telecommunications resources to ensure the reliability, security and safety of the nation's electrical utility infrastructure."[36]

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[34] Section 303(c) of the Communications Act directs the Commission to "assign bands of frequencies" as the "public convenience, interest, or necessity requires." 47 U.S.C. § 303(c).
[35] GAO, *Wireless Broadband Spectrum Management*, accessed at http://www.gao.gov/key_issues/wireless_broadband_spectrum_management/issue_summary.
[36] SCE Letter at 1.

Eversource Energy explained in November 2017 that it was in the process of …"finalizing its strategy to meet long-term telecommunications systems needs across its territory for the next ten years" and requested "prompt resolution to inform our direction for the 2018 DPU 'Grid Modernization' program in Massachusetts…."[37] Public Service Enterprise Group ("PSEG") announced its Energy Strong II plan in 2018, an effort focused largely on grid modernization. The plan envisions a private communications network that exhibits high reliability, high bandwidth, low latency, and enhanced security, a network where PSEG will control all aspects of its performance and will not be subject to third-party supplier constraints.[38] Dominion Energy Virginia has undertaken a comprehensive assessment of its telecommunications requirements for addressing imminent business and technical requirements. It evaluated factors such as cybersecurity, resiliency, capacity, flexibility, and risk of obsolescence and concluded that it needed an integrated solution to address the broad needs of a modernized electric grid:

> Tier 1: High-speed broadband with very low latency network with redundancy
> Tier 2: Broadband network without redundancy
> Tier 3: Field area network.[39]

Numerous electric utilities and other industrial entities face similar challenges.[40] They are obligated to plan for their long-term communications requirements and need prompt assurance from the Commission that a 900 MHz broadband option can be part of that evaluation process. Without that assurance, some will be forced to pursue more immediately available non-broadband

[37] Letter from Matthew Acton to Marlene H. Dortch, Secretary, FCC, WT Docket No. 17-200, at 1-2 (filed Nov. 17, 2017).
[38] *See, e.g.*, https://www.prnewswire.com/news-releases/pseg-unveils-next-phase-of-energy-strong-investments-300662501.html.
[39] *See, e.g.*, http://www.scc.virginia.gov/docketsearch/DOCS/3mqb01!.
[40] *See., e.g.,* Ameren Letter; *see also* Spyers, Tim – Ameren Network Engineering & Operations; Powers, Larry – Nokia Global Private LTE Solutions/Global Energy Sales. "Building a Ubiquitous Communications Infrastructure. It takes a village to raise a Private-LTE network." Electric Power Research Institute, EPRI Grid Analytics and Power Quality Conference and Exhibition, June 6-8, 2019, www.epri.com.

alternatives that address some, but certainly not all, of their requirements. Their systems will not be forward-compatible and upgradable to broadband. They will remain reliant on less advanced technologies until the licensees, or, when applicable, their rate-payers, are prepared to finance another replacement system.

A. Voluntary Exchange Process

PDV fully supports the NPRM plan to rely on a market-driven voluntary exchange program to replace incumbent frequencies in the proposed broadband segment with frequencies in the narrowband segments.[41] The Company agrees that voluntary exchanges may prove more efficient and faster than other approaches.[42] It has entered into a number of such agreements already in anticipation that the FCC might propose a band realignment to create a broadband option. In some cases, it has agreed to exchange frequencies with an incumbent while in others, the incumbent has elected to move out of the 900 MHz band entirely. In particular, incumbents that are in the process of replacing or upgrading their narrowband systems often are interested in deploying them on frequencies outside the proposed broadband segment to avoid future changes to their facilities. The Company would like to continue this sensible and mutually beneficial practice, but it may be hindered by the BB License eligibility criteria discussed in Section IV(A) below. Nonetheless, it has made known its desire to discuss potential realignment plans with all incumbents and will continue its outreach efforts during the pendency of this proceeding.

PDV is confident that it will be able to reach voluntary agreements with the great majority of incumbents in counties where it qualifies as the prospective broadband licensee ("Prospective

[41] The original EWA/PDV Petition and the associated rules recommended an initial period of voluntary negotiations.
[42] *See* T. Randolph Beard and George S. Ford, PHOENIX CENTER POLICY PERSPECTIVE NO. 18-08: *Expediting Spectrum Repurposing Through Market Transactions* (October 12, 2018) at 2 (available at: http://www.phoenix-center.org/perspectives/Perspective18-08Final.pdf) ("A spectrum auction is not the only way to allow market forces to determine the highest and best use of spectrum, however. Direct market transactions for flexible licenses are also well-suited to repurposing spectrum to new users and uses, and such commonplace private mechanisms are generally much more efficient than government processes.")

BB Licensee"), as defined in proposed Rule Section 27.1503(e). It has a deep understanding of the operational and technical requirements of narrowband systems, including the need to avoid any unscheduled system outage, and is prepared to address all reasonable realignment requests. However, it shares the Commission's expectation that a mechanism is needed to address what the NPRM calls "the holdout problem."[43] This could be instances when an incumbent either will not engage in the negotiation process at all or demands compensation entirely disproportionate to the cost of realignment or any reasonable reflection of the value of its spectrum holdings.[44] As a result, holdouts can foreclose socially valuable aggregations of property and, thus, constitute a form of market failure.[45] Indeed, delays caused by incumbents in search of higher prices could impose a social cost from postponed broadband deployment.[46]

For example, some 900 MHz incumbents are corporations of such size and economic heft that voluntary negotiations to relocate a handful of 900 MHz frequencies are unlikely to ever reach the top of their business/legal teams' to-do-lists. Others are governmental entities or other non-profit organizations for which economic compensation is not necessarily a motivation to consider a purely voluntary transaction. In both cases, negotiations are likely to stall, or never begin, without a regulatory backstop that requires those incumbents to engage in good faith with the Prospective BB Licensee.

Moreover, unlike services with 20 or 50 or even 500 megahertz allocations, it is not possible for narrowband and broadband LTE systems to "share" a 3/3 megahertz bandwidth. They cannot co-exist in a geographic area. Thus, a purely voluntary relocation process would allow a

[43] NPRM at ¶ 38.
[44] George S. Ford and Michael Stern, PHOENIX CENTER POLICY PERSPECTIVE NO. 18-10: *Addressing Holdouts in the Repurposing of Spectrum for Broadband Services* (December 19, 2018) (available at: http://www.phoenix-center.org/perspectives/Perspective18-10Final.pdf) at 3 ("spectrum repurposings are especially prone to holdups").
[45] *Id*. at 1.
[46] *Id*. at 6.

single covered incumbent licensee[47] that holds a license for a single 12.5 kilohertz frequency at a single site – a license that it acquired for the *de minimis* cost of frequency coordination and an FCC filing fee – to thwart the Commission's determination that a broadband option would serve the public interest. It would permit a licensee located 54.5 miles outside New York City to derail broadband in the nation's largest metropolitan area by holding out for a payment that bears no relationship to a market-driven value of its spectrum asset.[48] As explained in the NPRM, each covered incumbent "will therefore have an incentive to holdout for a larger share of the gains than it individually contributes."[49]

The Commission has recognized this inherent issue even when proposing to rely on voluntary relocations. The NPRM states that the Commission has addressed the holdout problem in other bands through mandatory relocation, but notes that commenters have raised concerns about the cost and disruption that could result from a mandatory process.[50]

In any spectrum repurposing, there always will be an incumbent(s) that wishes to maintain the status quo. The 900 MHz Band is no different. Even if the entire cost of relocation will be borne by the BB Licensee, as it assuredly would be, and even if the disruption can be managed without interruption to operations, which it can be, there never will be unanimity among incumbents that the public interest in facilitating the delivery of advanced technologies to America's industries should outweigh individual licensee concerns. Cost and disruption issues

[47] A "covered incumbent licensee" is defined in proposed Rule Section 27.1503(d): "Any entity that holds an existing site-based license in the 897.5-900.5/936.5-939.5 MHz band that, pursuant to § 90.621 of this chapter, is required to be protected by the 900 MHz BB licensee's placement of a base station at any location within the county covered by the BB license." The FCC should note that this proposed rule has two subsections (d).

[48] It also is important to remember that the incumbent does not own that spectrum "asset" but has been given authority by the FCC to use it. Commission precedent is clear that licensees have no inalienable right to a particular frequency(s). Their licenses can be modified, including to different frequencies, when the public interest so demands. *See, e.g., California Metro Mobile Communications, Inc. v. FCC*, 365 F.3d 38 (D.C. Cir. 2004).

[49] NPRM at ¶ 37.

[50] *Id.* at ¶ 38.

will arise whether the relocation process takes place pursuant to an entirely voluntary agreement, or pursuant to an agreement reached after an overlay auction when, as proposed in the NPRM, the auction winner is awarded mandatory relocation rights. To the extent an incumbent finds the prospect of relocation unduly burdensome, that burden will be the same however it is effectuated. If avoidance of any disruption to any incumbent's operations becomes the standard by which band repurposings are evaluated, it is difficult to see how encumbered bands could be modernized in the future to address evolving public interest goals.[51]

Thus, while PDV already is engaged in and will continue to support market-driven voluntary negotiations with the objective of clearing 900 MHz spectrum for broadband deployment as expeditiously as possible, it agrees with the Commission that there must be a backstop to address the holdout situation. Indeed, as Ford and Stern recognize, a "…clear signal that holdouts will not be tolerated will increase innovation by encouraging market transactions during an expiring transaction window."[52] For this reason, PDV commends the Commission for proposing a transaction window via a "success threshold" for voluntary relocations and encourages its adoption. If a Prospective BB Licensee has reached voluntary agreements with the great majority of covered incumbents within a defined period – the FCC has suggested agreement to relocate 90% of the channels in the first year with a reduction to 80% during the second year as possible thresholds[53] – remaining incumbents, with one critical exception, would become subject to mandatory relocation, albeit with full rights to comparable facilities and coverage of associated costs, a condition that should be specified in the rules with language similar to § 90.699. The

[51] Ford and Beard, *supra* n.42; Ford and Stern, *supra* n.44.
[52] Ford and Stern, *id.* at 5.
[53] These periods presumably would begin upon the opening of the filing window for Prospective BB Licensees described in the NPRM at ¶ 39.

Company supports this approach as an efficient means for accelerating the process of spectrum clearing and moving this broadband opportunity from concept to reality.

In fact, this is the only proposed means of addressing the "holdout" problem in a timeframe responsive to the urgency of the private broadband need. The overlay auction approach discussed below likely will be needed in some small number of counties where the success threshold is not met. However, implementation of its 5G FAST plan has committed the Commission to schedule a number of auctions over the next several years. Given the amount of spectrum that will be made available in them, it is natural that they will take precedence over any 900 MHz Band auction. The success threshold approach will create a private broadband option for the country's industrial community in many areas while the Commission's competitive bidding activities focus on addressing the consumer marketplace.

The NPRM proposes exempting from any mandatory relocation trigger what it describes as "complex systems…with 65 or more integrated 900 MHz sites."[54] PDV supports this proposal. There are a limited number of 900 MHz systems that meet that definition, and all are licensed to entities providing critical infrastructure services. PDV agrees that networks of that size will require particularly detailed relocation plans. The Company is prepared to work collaboratively with those licensees to ensure that any disruption is kept to a minimum, including by factoring likely weather conditions into the relocation schedule, addressing particularly sensitive facilities such as nuclear power plants, and including a "retreat" or back-up plan at critical junctures in the event an unanticipated issue arises. This approach was used in rebanding numerous large and highly complicated 800 MHz public safety and utility systems, a process that was completed without an unscheduled loss of communications capability. By creating a special, more deliberate

[54] NPRM at ¶ 38. PDV assumes the term "integrated sites" means sites that operate functionally as part of a related network of sites.

path for these systems, the FCC will allow the realignment process to proceed in the rest of the country at a pace dictated by the degree of incumbency and the urgency of broadband requirements in each county.

B. Auctions

The NPRM questions whether an overlay or incentive auction would be an appropriate mechanism for addressing the holdout problem in any county where the voluntary process has not accomplished full band clearing.[55] It asks first whether an overlay auction might be needed, recognizing that "a market-driven voluntary exchange process may not result in agreement to relocate all incumbents necessary to provide sufficient contiguous spectrum for broadband services, particularly in markets with heavy B/ILT use."[56]

PDV has indicated in this proceeding that it would not object to an overlay auction, provided that the auction process would not unduly delay accomplishment of the broadband objective described in the NPRM.[57] But, as discussed above, the Commission's schedule is already weighted down with anticipated auctions as the FCC advances the critical national 5G goal by providing the necessary spectrum fuel. The Company recommends that the FCC reserve this option as a backstop if needed to address any holdouts, but believes the success threshold discussed above must be applied first. It is a more efficient band-clearing mechanism, both for the Commission and for the utilities and other entities that have detailed their immediate need for a 900 MHz private broadband option.

[55] *Id*. at ¶¶ 41-55.
[56] *Id*. at ¶ 41.
[57] *See, e.g.*, Comments of Enterprise Wireless Alliance and pdvWireless, Inc. WT Docket No. 17-200, filed Oct. 2, 2017, at 24.

The NPRM also questions whether the FCC should use its incentive auction authority as a mechanism for reducing encumbrances and thereby facilitate 900 MHz Band clearing.[58] PDV recognizes that incentive auctions are an innovative and demonstrably successful tool for repurposing spectrum in appropriate bands. They are a fully market-driven process, although some incumbents still must be mandatorily relocated.

The Company is considering whether incentive auctions would be an effective tool in the 900 MHz Band, where incumbents in a county may hold as little as 12.5 kilohertz or as much as 250 kilohertz of spectrum. A significant number of incumbent licensees are not engaged in the provision of telecommunications services but use the spectrum for private internal communications and, thus, have specifically defined spectrum needs. PDV intends to examine this issue more closely prior to filing Reply Comments and will review with interest the Comments of other parties on this proposal. It does recommend, however, that the Commission extend to both auction approaches the exemption from mandatory relocation for "complex systems" described above.

IV SECURING A BROADBAND LICENSE

Repurposing the 900 MHz Band to create a broadband licensing opportunity requires the balancing of multiple interests. Adoption of a voluntary exchange process as the basis for spectrum clearing gives site-based incumbents assurance that their narrowband operations will remain fully viable and protected. The FCC also must be confident that any entity to which it awards a BB License already has a spectrum position in the band that justifies the right to consolidate its channels and convert to broadband service. The eligibility criteria must be stringent, yet also flexible enough to produce the desired result: the ability of an entity to secure a BB License to

[58] NPRM at ¶ 48.

"facilitate the development of broadband technologies and services..., including for critical infrastructure."[59] PDV believes that the FCC largely has achieved the correct balance in its proposed rules, but suggests that certain modifications would better promote the overall objective of facilitating private broadband systems for industrial use.

A. BB License Eligibility

The NPRM proposes a multi-part test for obtaining a BB License in each county.[60] The party must demonstrate that it holds licenses for all 20 geographically-licensed SMR blocks (sometimes hereinafter an MTA block(s)) covering the entire county.[61] It also must document that it has negotiated voluntary agreements with covered incumbent licensees to clear their operations from the broadband segment or demonstrate how it will protect any such licensees,[62] information that will be included in the transition plan to be submitted to the FCC pursuant to proposed § 27.1509(a)(2).[63] Finally, the applicant must agree to return to the FCC all 900 MHz licenses it holds for the county, whether site-based or geographically licensed. That spectrum, plus all otherwise unassigned 900 MHz spectrum outside the broadband segment, would become available, first, for the relocation of covered incumbent licensees, assuming the 900 MHz freeze

[59] *Id*. at ¶ 1.
[60] *Id.* at ¶ 29; *see also* proposed § 27.1509(a).
[61] The criterion that a Prospective BB Licensee hold all 20 geographically licensed 10-channel SMR blocks, or a combination of those blocks plus site-based licenses equaling at least 5 megahertz of spectrum as discussed below, ensures that only a single entity will qualify for the BB License, since there are only 399 channels in the 900 MHz Band.
[62] As explained above, it is not possible for a co-channel narrowband system to co-exist geographically with a 3/3 megahertz LTE system. Protection will require distance separation between broadband and narrowband facilities.
[63] As discussed below, the voluntary agreements may not include a spectrum premium. That is, the Prospective BB Licensee may only offer to exchange frequencies on a 1:1 basis, except when more spectrum is required to achieve equivalent coverage and/or capacity. NPRM at ¶ 36.

is lifted for that purpose,[64] and thereafter for any eligible site-based applicant, whether B/ILT or SMR.[65]

The first qualifying step requires the Prospective BB Licensee to reach agreement with all other MTA licensees, if any, in every county in which it wishes to obtain the BB License. The Company agrees that securing agreement among all MTA licensees is an essential ingredient in broadband repurposing.[66] The EWA/PDV Petition assumed that would be required.[67]

However, as recognized in the NPRM, there are markets where the FCC holds MTA spectrum in inventory, either because it was never purchased at auction or because it subsequently was returned to the Commission.[68] In those areas, it would be impossible for any entity to pass even the first test in the licensing process. While the NPRM asks whether the FCC should decline to award a BB License in those counties, that outcome would run counter to the very premise of this proceeding. It also would perpetuate the unfortunate fact that a substantial amount of this spectrum has been unused for years, even decades. Recognizing that dilemma, the NPRM also asks whether the rules should establish a minimum qualifying threshold of MTA licenses for Prospective BB Licensees. In PDV's opinion, the threshold should be ownership of all licensed MTA blocks, since that is the maximum that any party can acquire.[69]

While this numerical issue must be resolved, preferably as suggested above, the broader question is whether the contribution of this spectrum by the FCC threatens to produce an "undue

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[64] *Id*. at ¶ 36. *See Wireless Telecommunications Bureau Announces Temporary Filing Freeze on the Acceptance of Certain Part 90 Applications for 896-901/935-940 MHz (900 MHz Band) Spectrum*, Public Notice, WT Docket No. 17-200, DA 18-949 (WTB Sept. 13, 2018) ("900 MHz Freeze"). PDV believes lifting the 900 MHz Freeze for relocation purposes is an essential part of the 900 MHz Band realignment and strongly supports that plan. See Section IV(B).

[65] NPRM at ¶ 19.

[66] But see recommended exceptions to the 20 SMR block requirement discussed below.

[67] EWA/PDV Petition at 17.

[68] NPRM at ¶ 31. The FCC holds at least one such license in 13 MTAs (and also in MTA050: Guam-Northern Mariana Islands and MTA051: American Samoa), each of which includes a number of counties.

[69] The FCC reauctioned the remaining 900 MHz MTA spectrum in 2004 but much remains in the FCC's inventory.

windfall" for the Prospective BB Licensee. The NPRM notes that even in markets where the applicant holds all 20 MTA licenses, those blocks represent 5 megahertz of spectrum (2.5 megahertz paired), while the proposed broadband segment is 6 megahertz (3 megahertz paired).[70] It explains that the 20 MTA-block entry standard attempts to minimize the amount of spectrum that will be made available from the Commission's inventory.

In addressing this issue, the FCC has not only the right but the obligation to consider the public interest in making long-unused spectrum available for the specific purpose of creating a broadband allocation to address the unmet requirements of Critical Infrastructure Industry ("CII") and other industrial users as described in the NPRM. Consistent with its statutory mandate, all FCC actions must be grounded in the public interest, including its actions related to licensing matters. The Commission has stated that promoting the public interest is "the touchstone" for license modification decisions pursuant to that mandate[71] and has exercised its ample discretion on numerous occasions.

The FCC addressed this issue specifically in describing to the Court its balancing of these two factors – the public interest and the possibility of "unjust enrichment" of a licensee – in its Orders involving DISH Network Corp., Inc. ("DISH") and its ancillary terrestrial service rights in the 2180-2200 MHz bands.[72] The Commission explained its decision to allow the modification of DISH's licenses to include terrestrial rights, recognizing that the agency's action would increase

[70] NPRM at ¶ 30.
[71] *Metropolitan Transportation Authority*, File No. 0006682035, *et al*., Proposed Order of Modification and Order on Reconsideration, 31 FCC Rcd 1436 at ¶ 58 (2016).
[72] *See* NTCH, Inc. Brief for Respondents, USCA Case #18-1243 ("On Petition for Review of Orders of the Federal Communications Commission") (filed February 25, 2019) ("FCC Brief"); *see also Service Rules for Advanced Wireless Services in the 2000-2020 MHz and 2180-2200 MHz Bands*, Report and Order and Order of Proposed Modification 27 FCC Rcd 16102 (2012) ("AWS-4 Order"); *Service Rules for Advanced Wireless Services in the 2000-2020 MHz and 2180-2200 MHz Bands*, Order of Modification, 28 FCC Rcd 1276 (2013).

the value of those licenses substantially, on the basis that "the public stood to benefit from DISH's more efficient use of the spectrum."[73]

The FCC elected not to award those rights through the competitive bidding process "because modifying DISH's licenses would allow terrestrial build-out to start without need for further agency proceedings – thus avoiding, for example, the delay inherent in administering an auction."[74] The Commission agreed it had:

> …acknowledged that modifying DISH's licenses would "increase [their] value" – perhaps by as much as $6 Billion…but deemed modifying DISH's licenses the "best and fastest method" for bringing the Mobile Satellite S-band into terrestrial use. DISH's financial gain, the agency explained was a tolerable consequence of freeing the spectrum up for that important purpose.[75]

It explained further:

> As at the time of the Ancillary Service Order, the Commission confronted "a choice between quickly achieving the public-interest benefits of improved spectrum efficiency…at the price of giving [DISH] more than [it] had originally sought, or giving [DISH] only what [it] originally received at the price of [forgoing] the public-interest benefits" from increased terrestrial use….[76]

The FCC has reached similar conclusions in other instances. For example, it recently proposed a restructuring of the 2.5 GHz band "to allow more efficient and effective use of the [2.5 GHz] spectrum band by providing greater flexibility to current EBS licensees…to facilitate improved access to next generation wireless broadband…."[77]

There are additional examples of the Commission's considering how to weigh the public interest in improved spectrum utilization and access to advanced technologies against a potential windfall to a licensee. In a particularly complex proceeding involving a package of rule changes,

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[73] *Id.* at 28.
[74] *Id*.
[75] *Id*. at 16, *citing* AWS-4 Order.
[76] *Id*. at 29.
[77] *Transforming the 2.5 GHz Band*, WT Docket No. 18-120, Notice of Proposed Rulemaking, FCC 18-59 at ¶ 1 (2018).

the FCC modified the Wireless Communications Service ("WCS") rules for the 2.3 GHz band.[78] The original rules had effectively limited licensees to the provision of fixed WiMax services. In response to appeals from WCS licensees, the FCC adopted modified rules allowing them to offer mobile broadband services in 25 megahertz of the band without regard to the possibility of unjust enrichment, stating that, " The 2.3 GHz WCS spectrum will help to increase the supply of flexible use spectrum that can be used to address the explosive nationwide growth in consumer demand for mobile broadband services."[79]

When weighed against the broader public interest benefits of an industrial private broadband option, the Commission can be confident that its contribution of inventoried 900 MHz spectrum would be deemed entirely consistent with its statutory mandate.

The NPRM also seeks comment on whether ownership of any combination of site-based and MTA spectrum that totals at least 5 megahertz and covers the entire county should qualify an applicant as a Prospective BB Licensee.[80] PDV agrees that there are differences between site-based and geographic MTA licenses, although those differences become less pronounced when evaluating frequencies on a county, rather than MTA, basis. The Company sees no policy reason why a combination of license types should not qualify an entity to seek a BB License[81] or why B/ILT entities would be ineligible to apply. The Commission is proposing to regulate the 900 MHz BB Service under Part 27 of its rules. § 27.10, Regulatory Status, provides that authorizations will be granted to allow the provision of a variety of services, including private internal communications. Since Part 27 licensees are permitted to select that regulatory status, B/ILT-

[78] *Amendment of Part 27 of the Commission's Rules to Govern the Operation of Wireless Communications Services in the 2.3 GHz Band et al*., WT Docket Nos. 07-293 et al., Report and Order, 25 FCC Rcd 11710 (2010).
[79] *Id.* at ¶ 24.
[80] NPRM at ¶ 28.
[81] The FCC has already considered that possibility. *Id*. at n. 67.

eligible entities should be permitted to apply if they can demonstrate ownership of the requisite amount of spectrum.

B. Interim Incumbent Relocation

PDV also believes that one aspect of the 20 MTA Block licensing criterion should be modified before the Commission opens the filing window for applications from Prospective BB Licensees[82] and even, through modification of the 900 MHz Freeze, in advance of adoption of final rules in this proceeding. Proposed § 27.1509(a)(1), Eligibility, defines the requirement as follows:

> The applicant must hold the licenses for all 20 blocks of geographically-licensed 900 MHz SMR spectrum in the county.

The text of the NPRM further explains that the licensee "must hold rights to all spectrum associated with each of the 20 SMR blocks…."[83]

The requirement serves two related purposes. It ensures that the Prospective BB Licensee is contributing substantial spectrum to the 900 MHz BB Service. At the same time, because the Prospective BB Licensee must relinquish all of its licenses in the county to secure the BB license, the surrendered MTA licenses provide essential "green space" for relocation of covered incumbent licensees.[84]

The issue is a question of timing. It is clear that in endeavoring to claim Prospective BB Licensee status, PDV would be permitted to identify frequencies from any of its to-be-relinquished licenses outside the broadband segment as replacement frequencies in voluntary agreements. However, there are utilities and other business enterprise licensees with frequencies in the

[82] *Id*. at ¶ 39.
[83] *Id*. at n. 65.
[84] EWA recently filed a Petition for Rulemaking urging the Commission to reserve the 800 MHz Guard Band spectrum at 816-7/861-2 MHz as "green space" for relocating 900 MHz covered incumbent licensees and B/ILT licensees operating on channels in the 470-512 MHz band.

broadband segment that currently are in the process of replacing or upgrading their systems or are planning to do so in the near-term.[85] They would prefer to program their equipment now on frequencies outside the proposed broadband segment to avoid the need to modify it in the future. PDV is prepared to facilitate their efforts by entering into frequency exchanges prior to final Commission action, but the proposed rules make that effectively impossible.

The great majority of PDV's spectrum is geographic SMR authorizations. The Company holds some licenses for site-based frequencies that were purchased from the previous B/ILT licensees, but only a limited number in any geographic area. The systems undergoing upgrades or replacement tend to be large multi-site/multi-frequency networks, which is why they want to program them for non-broadband frequencies at the outset. Only MTA licenses have the geographic scope and channel depth to provide replacement frequencies where these entities need them. However, PDV cannot use those channels for that purpose since, under the proposed rules, PDV would lose the right to claim a geographically licensed SMR block if it had made any of the spectrum available as replacement for covered incumbent licensees' frequencies. It would forfeit the opportunity to apply as a Prospective BB Licensee.

PDV urges the Commission to allow credit for MTA licenses that have been partitioned or disaggregated for the specific purpose of providing non-broadband replacement spectrum to covered incumbents. If PDV(or any other applicant that has disaggregated and/or partitioned its license for that reason) ultimately obtains the BB License in the area, the outcome in terms of frequency exchanges would be identical – just later and at greater inconvenience to the incumbent. If an entity other than PDV becomes the BB License, that entity would benefit from this early band clearing. Allowing this flexibility would accelerate the 900 MHz Band transition without any

[85] *See*, *e.g.,* Letter from Jeffrey Greenblatt, LIPA, to Marlene H. Dortch, Secretary, FCC, WT Docket No. 17-200 (filed Dec. 12, 2017).

adverse effect on the process and could be accomplished through a Wireless Telecommunications Bureau ("WTB") clarification that frequency exchanges for reconfiguration purposes do not violate the 900 MHz Freeze.[86]

The Commission, in any event, should allow credit for MTA licenses where spectrum is leased to an incumbent for purposes of early deployment on non-broadband frequencies, with an expectation that they would become its permanent replacement frequencies. The FCC has been emphatically clear that licensees lose none of their license rights when entering into a spectrum lease:

> By adopting the leasing policies and procedures herein, we remove unnecessary regulatory constraints, lower transaction costs, and reduce spectrum acquisition costs, so as to enable more parties to enter into voluntary leasing arrangements, thus enabling more facilities-based competition by new providers. These policies provide potential lessees a ready means of obtaining access to that spectrum (in amount, location, and duration) best suited for their business needs. **They also remove regulatory uncertainty that may have prevented licensees from allowing a third party to gain access to fallow or underutilized spectrum, even at an acceptable negotiated price, because the licensees either did not want to abandon their future rights to the spectrum (through permanent transfer or assignment, or through partitioning or disaggregation) or risk losing their licenses as unauthorized transfers of *de facto* control under [§] 310(d).**[87]

As in the situation above, the lease would ripen into a permanent authorization(s) if the lessor became the BB Licensee. If it did not, the lease would terminate but the incumbent still would need replacement frequencies. The non-lessor BB Licensee would be in the advantageous position of having an incumbent eager to enter into a voluntary exchange agreement that would

[86] If the FCC does not adopt rules along the lines of those proposed in the NPRM, there still would be no negative outcome. PDV and other MTA licensees are free today to partition and/or disaggregate geographic licenses just as would be the case here. If the FCC adopts broadband rules but modifies the location of the broadband segment, the incumbent might need to replace other frequencies, but it would be in no worse and likely a better position than under the current proposed rules.

[87] *See Promoting Efficient Use of Spectrum through Elimination of Barriers to the Development of Secondary Markets*, WT Docket No. 00-230, 18 FCC Rcd 20604 at 20605 at ¶ 2 (2003) (emphasis added).

allow it to remain on the previously leased frequencies, but without any obligation on the part of the BB Licensee to agree to that arrangement.

Permitting an incumbent to obtain a license for early replacement spectrum, as opposed to lease authority, would be preferable from the incumbent's perspective. Utilities and other business enterprise entities often need to work through multiple levels of approval for matters relating to financial commitments, including communications systems. Explaining that it is swapping out the frequencies on its licenses for ones that will be permanent replacements is vastly easier than explaining that it is going to build the new system with frequencies that it is leasing, with only an expectation that it will be able to license them permanently at some future date.

For these reasons, PDV urges the Commission to revisit this issue and allow incumbents with immediate or imminent system deployments to enter into voluntary frequency exchanges without compromising a Prospective BB Licensee's right to claim the exchanged, geographically licensed SMR block for purposes of eligibility. Doing so would accelerate and simplify the clearing of the broadband segment without diminishing the amount of spectrum being contributed by the Prospective BB Licensee.

C. Association of American Railroads

AAR occupies a unique position in the 900 MHz Band. It holds a unique geographic license, located in the site-based portion of the band, call sign WPSF894, for six non-contiguous narrowband channels with effectively nationwide authority. The spectrum is used by the freight railroads for Advanced Train Control/Central Traffic Control operations. Of those six frequencies, three are within the proposed broadband segment and three are below it in the lower narrowband segment.

This spectrum position reflects AAR's singular operating requirements among all PLMR users. Its "service area" spans the nation and includes close to 10,000 transmitters providing safety-critical communications links. It was these elements that caused the FCC in 2001 to allow the consolidation of numerous site-based 900 MHz licenses into this single geographic authorization in order to provide for greater flexibility and administrative streamlining when adding new sites.[88] Because AAR already holds a nationwide license, its replacement frequencies must come from MTA spectrum. It would not be possible to provide AAR with comparable facilities across the country on B/ILT frequencies as there are no B/ILT frequencies that are entirely incumbent-free nationwide.

PDV has recognized from the outset that AAR's nationwide 900 MHz interests must be addressed if broadband is to be deployed anywhere in the country. The EWA/PDV Further Comments in this proceeding explained that PDV was engaged in productive discussions with AAR about future railroad operating requirements in the 900 MHz Band.[89] They referenced AAR's Comments and Reply Comments in this proceeding in which AAR urged the Commission to create wideband channels of 50-500 kilohertz bandwidth to accommodate next generation communications requirements. These entities have multiple, critical wayside applications that would be supported with wideband technology.

AAR's evaluation of its future communications needs has continued to evolve since its earlier filings in this proceeding. It has concluded that a bandwidth of at least 125 kilohertz, 10 contiguous 12.5 kilohertz channels, will be needed to deploy a flexible, modernized network, a

[88] *See Petition of Association of American Railroads (AAR) for Modification of Licenses for Use in Advanced Train Control Systems and Positive Train Control Systems*, Order, 16 FCC Rcd 3078 ¶ 7 (WTB 2001).
[89] Further Comments of Enterprise Wireless Alliance and pdvWireless, Inc., WT Docket No. 17-200, filed May 1, 2018 ("EWA/PDV Further Comments").

network that will support this backbone of the U.S. economy, as every business depends to a greater or lesser degree on a national rail system that operates safely and efficiently.

For these reasons, and as previously described to FCC staff, AAR and PDV have negotiated a Letter of Intent to exchange all six of AAR's non-contiguous frequencies for the nationwide 10-channel A Block, contingent upon FCC approval. This accommodation of AAR's requirements raises several issues in light of the NPRM. First, as in the situation described above, the exchange of geographic MTA block frequencies for band realignment purposes would not allow that MTA spectrum to remain credited to the Company for purposes of satisfying the Prospective BB Licensee eligibility criteria. In addition, since the FCC holds the A Block spectrum in MTA006, MTA007 and MTA029, it will need to allow that spectrum to be assigned to AAR in exchange for PDV's relinquishment of its unencumbered C Block spectrum in those same markets. Further, this exchange would not meet the strict 1:1 replacement frequency standard proposed in the NPRM.

While the 1:1 standard may be appropriate for other covered incumbents, it would not recognize AAR's unique position in the 900 MHz band today or address the future operational requirements it has identified. Just as it did in allowing the conversion of site-based licenses to a single geographic authorization in 2001, a conversion right granted to no other PLMR licensee in any band, the FCC can, and in PDV's opinion should, accord AAR comparably unique licensing authority in this instance. It should permit AAR to exchange its six non-contiguous frequencies for a nationwide 10-channel MTA block covering AAR's current ribbon license footprint, and it should allow the original licensee of the MTA block to retain credit for that spectrum for BB Licensee eligibility purposes.

D. Applications for BB License/Voluntary Exchange Process

The NPRM describes proposed procedures for initiating the Voluntary Exchange Process that is defined in § 27.1503(f).[90] The Commission plans to issue a Public Notice announcing that it is opening a filing window to accept applications that meet the eligibility and application requirements. Those applications must include a Transition Plan that describes:

(1) The frequencies within the broadband segment that the applicant seeks from the FCC's inventory;

(2) The applicant's rights to all 20 blocks of MTA licenses, and any site-based licenses the applicant will surrender in exchange for the BB License;

(3) The applications that the parties to each Voluntary Exchange Agreement will file detailing the narrowband frequencies that will be used to relocate or repack each covered incumbent license in that agreement;

(4) The details of how the applicant will provide interference protection to any covered incumbent with which it does not have a Voluntary Exchange Agreement; and

(5) Any rule waivers or other actions necessary to implement the Transition Plan.[91]

Recognizing that an applicant may choose to transition multiple counties simultaneously, the FCC proposes to allow the filing of the same Transition Plan with multiple applications.[92]

Because no application can be filed until the elements above have been satisfied, the NPRM questions whether the window should remain open indefinitely or be time-limited as an inducement to encourage negotiations and discourage holdouts. In PDV's opinion, the resolution of this issue is dependent on the FCC's decision about how to address the holdout issue. Assuming it adopts a success threshold with a backstop overlay auction plan, the window should remain open indefinitely.[93] The time needed to complete a Transition Plan will be different in different counties

[90] NPRM at ¶ 39.
[91] *See* § 27.1503(g); *see also* § 27.1509(a)(2).
[92] NPRM at ¶ 35.
[93] If the FCC elects to adopt a success threshold, the window for filing an application in a particular county cannot close before that process has been completed.

depending on the number of covered incumbents, the complexity of their systems, and their willingness to engage in negotiations. A too-short window might jeopardize what otherwise could be a successful negotiation process. As long as there is a defined point after which the Prospective BB Licensee can require any remaining covered incumbents to relocate,[94] provided they receive comparable facilities and their costs are paid, the window should remain open.

For all the reasons described in the NPRM and as discussed above, a failure to adopt an effective means of addressing holdouts would jeopardize the fundamental purpose of this proceeding. It could deny an opportunity for deployment of private broadband networks in some parts of the country within a timeframe that is consistent with the urgency of industrial demands.

The Commission has proposed one limitation on the terms of Voluntary Exchange Agreements. Specifically, to ensure that the FCC remains spectrally whole to the greatest extent possible, the NPRM states that the Prospective BB Licensee may not offer an exchange that exceeds the covered incumbent's current spectrum holdings in the county.[95] There is an exception if additional spectrum is needed to provide equivalent coverage and/or capacity.

PDV appreciates the FCC's position on this issue, although it believes that some greater flexibility could accelerate the band clearing process. The Company also assumes that this limitation applies only to replacement 900 MHz frequencies such that an agreement to provide the covered incumbent with spectrum in addition to or other than 900 MHz in any amount and in any other band would be permissible, but requests that the Commission confirm that understanding.

The NPRM also asks whether the FCC should require relocating incumbents to transition from the band's current 12.5 kilohertz bandwidths to channels of 6.25 kilohertz bandwidth.[96]

[94] Under the proposed success threshold, licensees of complex systems would never be subject to a mandatory relocation process.
[95] NPRM at ¶ 36.
[96] *Id*.

Mandatory narrowbanding to a 6.25 kilohertz bandwidth certainly would increase the pool of available relocation frequencies, but PDV does not support such a requirement. It would have a significant impact on the technical and operational parameters of covered incumbent systems, affecting all their frequencies, not just those in the broadband segment. In a wireless world where technology is moving rapidly toward broader bandwidth systems, a migration the FCC is actively promoting through its ambitious efforts to free up increasing amounts of spectrum for broadband use, the incumbents in this band should not be subjected to a 6.25 kilohertz bandwidth mandate.

V OTHER LICENSING AND OPERATING RULES

As an initial matter, PDV supports the Commission's proposal to designate the 900 MHz BB service as a Miscellaneous Wireless Communications Service regulated under Part 27 of the FCC rules.[97] The Part 27 rules, in general, are better aligned with this proposed service than the Part 90 rules that for the most part are designed around narrowband site-based rather than broadband geographic systems. Part 27 simply is a better fit.[98] The proposed rules in the NPRM do an excellent job of cross-referencing Part 90 and Part 27 regulations when necessary, for example when specifying that narrowband Part 90 systems will receive protection from a BB Licensee in accordance with § 90.621(b).[99]

A. Licensing Rules

1) Eligibility – In addition to the detailed eligibility requirements for Prospective BB Licensees, the NPRM requests comment on whether it should use the "open eligibility" standard common in competitive bidding processes if it adopts an overlay or incentive

[97] *Id*. at ¶ 56.
[98] The Part 27 rules requiring foreign ownership reporting apply only to Part 27 licensees classified as common carriers. *See* 47 U.S.C. § 310.
[99] *See* § 27.1503(d).

auction approach for counties in which the Voluntary Exchange Process has not been successful in clearing the broadband segment.[100] To the best of PDV's knowledge, all FCC auctions have allowed open eligibility. The Company is not aware of any factor that would warrant a different approach in a 900 MHz auction.

2) Mobile Spectrum Holdings Policies – PDV agrees that the particular characteristics of the 900 MHz BB service should exempt it from the FCC's spectrum screen.[101] Because it is a smaller amount of spectrum than other broadband segments, the FCC is correct in concluding that its use will be focused on industrial, including CII, and governmental customers with needs that are not addressed satisfactorily on the consumer-oriented commercial networks for which the spectrum screen was developed. It will not be competing for the broad consumer customer base. Should technology advances change this assessment at some future date, the Commission can revisit this issue.

3) License Term – The Company supports the FCC's proposal to adopt a 15-year term for 900 MHz BB Licenses.[102] As discussed below, the performance requirement will start to run from issuance of the BB License, not when the broadband segment has been cleared so that system deployment can begin.[103] The longer license term allows for more extended build-out deadlines that also reflect the fact that the entities that will be using this spectrum - utilities, major corporations, and governmental entities - often have lengthy internal decision-making cycles that must be navigated before they can begin to implement a system.

[100] NPRM at ¶ 57.
[101] *Id*. at ¶ 58.
[102] The FCC has tentatively proposed the same 15-year term for licenses in the 1675-1680 MHz band. *See Allocation and Service Rules for the 1675-1680 MHz Band*, WT Docket No. 19-116, Notice of Proposed Rulemaking and Order, FCC 19-43 (rel. May 13, 2019).
[103] NPRM at ¶ 59.

4) Performance Requirements - The NPRM proposes that 900 MHz BB Licensees be subject to a requirement that they are providing reliable coverage and offering service to at least 45% of the population in the license area within six years of the license issuance date (first performance benchmark) and to at least 80% of the population within 12 years (second performance benchmark).[104] A failure to meet the first performance benchmark would result in acceleration of the second deadline by two years, to the 10-year mark, and a reduction of the license term from 15 to 13 years.[105] If the licensee misses its second performance benchmark, its authorization would cancel automatically.[106]

These requirements are similar to those imposed on commercial broadband networks and may prove reasonable. The caveat, as noted in the NPRM and as referenced above, is that the users of this spectrum are likely to be industrial entities deploying private networks to meet defined operating requirements with specific coverage parameters. Depending on the comments received from such entities, the FCC may conclude that more tailored performance requirements, ones tied to geographic rather than population coverage, should be adopted. It also should consider including an alternative substantial service showing given the expected users of this spectrum. Such showings allow the Commission to evaluate individualized demonstrations of the use to which the spectrum has been put and determine whether that usage is reasonable and consistent with the public interest.

5) Renewal Construction Obligations – The Commission in 2017 completed a multi-year proceeding in which it adopted new renewal standards for all Wireless Radio Services, including those regulated under Part 27 of the FCC rules. While revised § 1.949 is not yet

[104] *Id*. at ¶ 60.
[105] *Id.* at ¶ 63.
[106] *Id.*

effective, the new rules presumably will be in place by the time any BB Licenses are issued pursuant to the Commission's decisions in this proceeding. PDV is not aware of any matter specific to the 900 MHz broadband spectrum that would require different renewal or construction obligations.

B. Technical Rules

PDV shares the Commission's objective regarding the technical rules that should apply to the proposed broadband segment: "Our goal…is to develop flexible rules that enable a wide variety of services, while providing sufficient protection to licensees in adjacent narrowband spectrum, as well as to licensees in the broadband segment in adjacent areas."[107] The rules proposed in the NPRM are consistent with the broadband segment regulations recommended by EWA/PDV in their Further Comments.[108] PDV is confident that they will allow the Commission to achieve its objective.

VI CONCLUSION

The NPRM represents a major step toward addressing the private broadband requirements of America's industrial entities, the economic engine that collectively drives the American economy. PDV urges the Commission to adopt final rules consistent with the recommendations herein as promptly as possible so that the broadband networks envisioned by providers of services critical to the American public can become reality.

[107] *Id.* at ¶ 70.
[108] EWA/PDV Further Comments.