

June 30, 2016

VIA ELECTRONIC DELIVERY

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street S.W.
Washington, DC 20554

**Re: Notice of Ex Parte Presentation
GN Docket No. 14-177; IB Docket No. 15-256; RM-11664; WT Docket No. 10-112;
IB Docket No. 97-95**

Dear Ms. Dortch:

On Tuesday, June 28, 2016, Nextlink Wireless, LLC (“Nextlink”), an operating affiliate of XO Communications, LLC (“XO”), met with: (1) Edward “Smitty” Smith, Legal Advisor to Federal Communications Commission (“FCC” or “Commission”) Chairman Tom Wheeler and Ariel Diamond, legal intern to Chairman Wheeler’s office; (2) Johanna Thomas, Legal Advisor to Commissioner Jessica Rosenworcel; and (3) Brendan Carr, Legal Advisor to Commissioner Ajit Pai, to discuss the Commission’s *Notice of Proposed Rulemaking* in the above-referenced proceedings.¹ Attending the meetings on behalf of Nextlink/XO were: Lisa Youngers, Vice President and Assistant General Counsel – Federal Affairs; Patrick Thompson, Director, Legislative Affairs; Michele Farquhar and Tom Peters of Hogan Lovells US LLP, counsel and advisor to Nextlink/XO, respectively; and Mike Lasky of Widelity, Inc., consultant to Nextlink/XO.²

Nextlink noted at each of the meetings its enthusiasm for offering mobile services in the band, and its desire to support the development and deployment of 5G networks and services. Nextlink has been a leader in the Local Multipoint Distribution Service (“LMDS”) band, including making substantial investments in the band, securing equipment for use in the band, and joining with other LMDS licensees to solve common problems throughout the years. However, Nextlink expressed concern that, under some of the FCC’s proposed rules for the 28 GHz band, the costs to deploy 5G will far outweigh the benefits. Specifically, the Commission’s proposals to: (1) issue new

¹ See *Use of Spectrum Bands Above 24 GHz for Mobile Radio Services, et al.*, Notice of Proposed Rulemaking, 30 FCC Rcd 11878 (2015) (“*NPRM*”).

² Eric Miller, Senior Wireless Strategist to Nextlink/XO also joined the meeting with Edward Smith and Ariel Diamond by telephone.

Upper Microwave Flexible Use (“UMFU”) licenses for the 28 GHz A1 band in county-based geographic license sizes; (2) adopt aggressive performance metrics for new mobile UMFU licenses; (3) bifurcate the A1 band into two separate, 425 megahertz blocks; and (4) create LMDS “orphan” bands by not providing 5G flexibility for the A2, A3 and B blocks will all strand existing deployments and present significant costs and challenges to new UMFU licensees. The FCC’s proposals also threaten to harm consumers and the public interest through inefficient use of valuable spectrum resources. Moreover, several of these proposals deviate significantly, without justification, from prior Commission precedent related to other spectrum bands.

Nextlink’s Leadership and Deployment in the LMDS Band

As one of the largest licensees of LMDS spectrum, Nextlink has taken a leadership position vis-a-vis other licensees to help maximize the use of the band. This has ranged over the years from working with smaller licensees to help them navigate the Commission rules and renewal processes, connecting current licensees with other holders about spectrum transactions, as well as investing millions of dollars in new technologies in partnership with equipment manufacturers. Further, Nextlink has made equipment available to other licensees to help them meet their deployment needs. Nextlink is often the first to market with new microwave technologies and also helps establish how the LMDS bands can be best configured for providing high speed wireless connections. Nextlink, through its vendor relationships, is continuing to invest in the development of equipment with the explicit intent of making the resulting devices available to the industry. Nextlink’s investment in the LMDS band is more than just dollars, more than just innovations, but one of stewardship to a community of microwave providers.

Challenges and Costs of County-Based Licensing

Nextlink began by discussing the substantial financial and technical burdens of issuing any 28 GHz UMFU licenses on a county-by-county basis. Nextlink explained that it does not support county-based licensing because adopting extremely small geographic license areas would increase the amount of interference coordination that operators will need to engage in as they deploy services over the newly licensed spectrum, adding substantially to the cost of building out these licenses and presenting other financial and technical challenges.³ Nextlink noted that the Commission has previously recognized these concerns in the context of other recent license size determinations, including for the spectrum to be offered in the incentive auction. In the *Incentive Auction Report and Order*, the FCC rejected smaller license areas, noting that “more service areas could complicate potential bidders’ efforts to plan for, and participate in, the auction of related licenses, potentially affecting the success of the auction. More service areas could also complicate subsequent service deployment.”⁴

³ See Reply Comments of XO Communications, LLC, GN Docket No. 14-177, *et al.* at 8-9 (filed Feb. 26, 2016); *see also* Reply Comments of The Wireless Internet Service Providers Association, GN Docket No. 14-177, *et al.* at 3-4 (filed Feb. 26, 2016) (“[I]f an LMDS license were subdivided into eight separate county-wide licenses, the licensee would need to meet regulatory obligations, file renewal applications and pay regulatory fees for each of the eight licenses.”).

⁴ See *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Report and Order, 29 FCC Rcd 6567, 6603-04 ¶ 80 (2015).

Under the new proposal, Nextlink's LMDS A1 band licenses would expand to as many as 1,534 county-based licenses.⁵ Nextlink recounted the dramatic increase in capital expenditures and operating expenditures that county-based licensing would create for an operator in its position to meet existing substantial service requirements for each individual county.⁶ Nextlink noted that the Commission's current proposal deviates from the Commission's established preference for "building block" license areas that "nest" into larger areas, which allow nationwide service providers to aggregate a large geographic footprint at reduced transactional costs.⁷

In addition to previously noted financial hurdles, Nextlink explained how issuing UMFU licenses based on counties could present several technical difficulties, such as obtaining access to adequate siting and fiber facilities and handling increased coordination issues at the far greater number of license borders.⁸ In some circumstances, licensees will face significant challenges to deploying substantial service, irrespective of costs, and there may be inadequate population to support ongoing operations. Due to these issues, rural county UMFU licenses held in FCC inventory may not sell in an auction, diminishing the potential availability of 5G service in these areas and the overall value of the 28 GHz band.

For these reasons, a large majority of commenters opposed the Commission's novel, never-before-tested county-based licensing scheme for 28 GHz UMFU licenses.⁹ Indeed, even rural and

⁵ Nextlink holds 93 LMDS licenses, 61 of which cover the A1 band. Nextlink's estimates of the number of county- and partitioned PEA-based licenses it would hold is based solely on its A1 band holdings. See attach. at 5, 7. As discussed in further detail below, the Commission's proposal to bifurcate the A1 band into two separate, 425 megahertz blocks will only exacerbate the problems posed by a county-based licensing scheme.

⁶ See, e.g., *Ex Parte* Letter from Michele C. Farquhar, Counsel to Nextlink Wireless, LLC and XO Communications, LLC to Marlene H. Dortch, Secretary, FCC, GN Docket No. 14-177, *et al.* at 1-4 (filed June 3, 2016) ("*Nextlink June 3 Ex Parte*"); *Ex Parte* Letter from Michele C. Farquhar, Counsel to Nextlink Wireless, LLC and XO Communications, LLC to Marlene H. Dortch, Secretary, FCC, GN Docket No. 14-177, *et al.* at 2-3 (filed June 21, 2016) ("*Nextlink June 21 Ex Parte*").

⁷ See *Amendment of the Commission's Rules with Regard to Commercial Operations in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz Bands*, Report and Order, 29 FCC Rcd 4610, 4633 ¶ 49 (2014) ("Licensing some areas by [Economic Areas] will enable large carriers to minimize post-licensing aggregation costs. Also, because EAs are nested within [Major Economic Areas] and [Regional Economic Area Groupings], large carriers will be able to aggregate their spectrum into even larger areas, with minimal aggregation costs.").

⁸ See *Nextlink June 3 Ex Parte* at 3; *Nextlink June 21 Ex Parte* at 3.

⁹ See, e.g., Reply Comments of Intel Corp., GN Docket No. 14-177, *et al.* at 2 (filed Feb. 26, 2016) ("While many of the Commission's primary proposals were supported by a majority of commenters, a small minority of those proposals received substantial opposition. These include . . . the proposal for county-based license areas . . ."); Reply Comments of Nokia, GN Docket No. 14-177, *et al.* at 3 (filed Feb. 26, 2016) ("Commenters widely agree that the geographic licensing area should be larger than county-level."); Reply Comments of Samsung Electronics America, Inc. and Samsung Research America, GN Docket No. 14-177, *et al.* at 10 (filed Feb. 26, 2016) ("The majority of

regional carriers and their trade association “object[] to the Commission’s proposal to change incumbent LMDS license sizes from BTA[s],” noting that the Commission’s proposed change would harm incumbent licensees, “especially small and rural carrier licensees”¹⁰ Nextlink encourages the Commission once again to maintain existing BTAs for 28 GHz licenses, or to adopt its PEA conversion proposal (discussed below).

Exacerbated Challenges Resulting from Population-Based Performance Requirements

The significant problems created by the Commission’s county-based licensing proposal are amplified by the Commission’s proposed 40 percent population-based performance requirement for new mobile UMFU licenses or an arbitrary links per POPs requirement for point-to-point service.¹¹ Because of the limited signal propagation of millimeter-wave band spectrum, operators are likely to provide coverage to relatively small geographic areas. While population metrics may be appropriate for low-band spectrum below 3 GHz, this same paradigm would be extremely difficult for millimeter-wave spectrum bands on a county basis. Millimeter-wave spectrum is likely to serve entirely different use cases than spectrum bands for which the FCC has adopted population-based performance metrics. A high proportion of millimeter-wave coverage will likely occur in areas where people work or visit, such as stadiums, industrial facilities and office parks, rather than where they live. And as several experts have previously explained to the Government Accountability Office, some buildout requirements can actually have the perverse incentive of forcing licensees to use older or less innovative technologies to deploy service more quickly as opposed to promoting the provision of innovative services throughout a license area.¹²

Incumbent licensees who use the A1 and A2 bands for uplink and downlink fixed operations, respectively, would also face conflicting performance requirements under the FCC’s proposed rules. Licensees may be forced to achieve a population-based performance metric for the A1 band, but a substantial service showing for the A2 band.¹³ Nextlink agrees with CCA that “[d]ramatically

commenters opposed the Commission’s proposed county-based licensing scheme for the 28 GHz, 37 GHz, and 39 GHz bands.”); Reply Comments of Straight Path Communications Inc., GN Docket No. 14-177, *et al.* at 6 (filed Feb. 26, 2016) (“Commenters in this proceeding almost unanimously oppose the Commission’s proposed county-based licensing scheme for 28 GHz and 39 GHz bands.”); Reply Comments of T-Mobile USA, Inc., GN Docket No. 14-177, *et al.* at 15 (filed Feb. 26, 2016) (“T-Mobile agrees with Verizon that county-level licenses could prove administratively complex and burdensome.”).

¹⁰ See *Ex Parte* Letter from Rebecca Murphy Thompson, Executive Vice President and General Counsel, Competitive Carriers Association to Marlene H. Dortch, Secretary, FCC, GN Docket No. 14-177, *et al.* at 3 (filed June 29, 2016) (“CCA *Ex Parte*”).

¹¹ See *NPRM*, 30 FCC Rcd at 11939-40 ¶¶ 207-10.

¹² See Government Accountability Office, *Spectrum Management: FCC’s Use and Enforcement of Buildout Requirements*, GAO-14-236 at 25, 27 (Feb. 2014).

¹³ These licensees will also face a hodgepodge of substantial service showings based on the different geographic license areas for the A1 band versus the A2 band.

changing the character of existing LMDS licenses would result in sunk costs for carriers who have already invested in network technology and may result in decreased coverage for rural areas.”¹⁴

Thus, population-based performance metrics would be inappropriate for millimeter-wave band spectrum such as 28 GHz. Similar to the Commission’s county-based licensing proposal, numerous commenters opposed strict population-based performance requirements for UMFU licenses.¹⁵ Rather than adopting conflicting and amorphous performance requirements based on the type of technology and services deployed, Nextlink recommended that the FCC instead adopt a safe harbor of one “installation” per license area for each of the bands, particularly if county-based license areas are used.

Disadvantages of Bifurcating the A1 Band

The Commission will further disadvantage incumbent licensees and create administrative difficulties if it moves forward with its proposal to break the A1 band into two 425 megahertz blocks.¹⁶ Splitting the A1 band into two blocks will exacerbate the county license area problems noted above, increasing the number of Nextlink licenses to 1,534.¹⁷ Moreover, given the nature of the equipment deployed in the LMDS band, splitting the band will strand incumbent licensees’ current deployments and may require completely new deployment in (at least) one half of the band. The Commission should not reverse course from its initial finding that “continuing to license this band as a single block would be in the public interest because it would provide a wide band (850 megahertz) of contiguous spectrum that could be used to provide high-speed service.”¹⁸

Partial Economic Area Conversion Proposal

Assuming that the FCC decides to change the geographic license area for 28 GHz A1 band UMFU licenses, Nextlink urged the FCC to issue these licenses based on Partial Economic Areas (“PEAs”). As Nextlink has previously noted, current LMDS licenses could be converted into 225 fully intact PEAs, representing 55 percent of total PEAs and approximately 106 million POPs, and the total number of 28 GHz UMFU licenses under Nextlink’s PEA conversion plan would remain substantially less than the proposed county-based licensing approach.¹⁹ Rather than splitting the

¹⁴ *CCA Ex Parte* at 4.

¹⁵ See Reply Comments of XO Communications, LLC, GN Docket No. 14-177, *et al.* at 9-11 (filed Feb. 26, 2016).

¹⁶ See Fact Sheet, FCC, Spectrum Frontiers Proposal to Identify, Open Up Vast Amounts of New High-Band Spectrum for Next Generation (5G) Wireless Broadband (June 23, 2016), *available at* <https://www.fcc.gov/document/fact-sheet-spectrum-frontiers-item> (“FCC Fact Sheet”).

¹⁷ See attach. at 7.

¹⁸ See *NPRM*, 30 FCC Rcd at 11914 ¶ 116.

¹⁹ See *Ex Parte* Letter from Michele C. Farquhar, Counsel to Nextlink Wireless, LLC and XO Communications, LLC to Marlene H. Dortch, Secretary, FCC, GN Docket No. 14-177, *et al.* (filed June 8, 2016).

LMDS A1 band into 6,442 county-based license areas,²⁰ under a PEA conversion plan the ultimate number of license areas could be as few as 651 in total.²¹

The Commission has the opportunity to harmonize the geographic licensing size for UMFU licenses with the license size adopted for 600 MHz spectrum, which is also expected to be used for some 5G services. To the extent the FCC adopts PEAs for the 37 and 39 GHz bands,²² implementing PEAs for 28 GHz UMFU licenses would create greater uniformity and harmonization of license areas among the 5G licenses. Because PEAs are similar in size to the current BTA licenses,²³ assigning 28 GHz UMFU licenses by PEAs and partitioned PEAs would help to mitigate the technical challenges and financial burdens of no longer issuing licenses based on BTAs.

For these reasons, Nextlink urges the Commission to issue 28 GHz UMFU licenses based on Nextlink's PEA conversion plan, should it decide not to maintain existing BTAs. At a minimum, if the FCC reconfigures the geographic license areas for existing A1 band licensees, then it should extend existing licensees' renewal dates, with licensees demonstrating substantial service as of the date of the extended license renewal term, rather than an interim date.²⁴

Challenges of Creating "Orphan" LMDS Bands: A2, A3 and B Blocks

Nextlink also urged the Commission to include the A2 and A3 bands and the B block of the 28 GHz band in a flexible use plan for 5G.²⁵ Nextlink's current LMDS point-to-multipoint installations conform to the European Telecommunications Standards Institute standard frequency division duplexing (FDD) band plan where the A1 and the A2 band are used as the uplink and downlink, respectively, with 1,008 megahertz of duplex spacing.²⁶ Most of Nextlink's lease customers utilize the same band plan, thereby potentially crossing two call signs with one installation.²⁷ In addition, Nextlink coordinates with satellite providers in the A2 band and only uses the band for downlink operations, further restricting the use of A2 if not paired with A1 in the same call sign. If the FCC separates the A1 band from the A2 and/or A3 bands, then new licensees utilizing point-to-multipoint equipment will likely need to deploy co-located multipoint builds only in the A1 band. New licensees

²⁰ This accounts for the 3,143 counties in the United States plus the 78 counties within the territory of Puerto Rico, and presumes the Commission adopts its proposal to bifurcate the A1 band into two blocks.

²¹ See attach. at 5. This assumes the Commission retains the current structure of the A1 band as a single block.

²² See FCC Fact Sheet at 1.

²³ See attach. at 5.

²⁴ See, e.g., *Nextlink June 3 Ex Parte* at 5.

²⁵ See Comments of XO Communications, LLC, GN Docket No. 14-177, *et al.* at 11-16 (filed Jan. 28, 2016); Reply Comments of XO Communications, LLC, GN Docket No. 14-177, *et al.* at 4-6 (filed Feb. 26, 2016).

²⁶ See attach. at 8-9; see also *NPRM*, 30 FCC Rcd at 11901 ¶ 67; 47 C.F.R. §101.1001(b)(2).

²⁷ See attach. at 8-9.

will not have access to spectrum in the A2 band for downlink operations. If multipoint downlink operations are present in the A1 band, this could cause interference where new licensees' A1 downlinks are co-channel with legacy A1 uplinks, leading to an inefficient use of spectrum and the need to create a new generation of point-to-multipoint equipment. Current LMDS use cases are expected to play a major role in future 5G deployments, and breaking up the A1 band into separate licenses or separating the A1 and A2 bands will eliminate existing deployment scenarios.

Importantly, the record shows that 5G can be deployed over bandwidths smaller than the 500 megahertz threshold the FCC has proposed for identifying new millimeter-wave bands for flexible use.²⁸ As demonstrated in the technical study attached to Nextlink/XO's comments, 5G data rates can achieve greater than 3 Gbps throughput using only 200 megahertz of spectrum.²⁹ Nextlink noted that in many markets, making up approximately 28.5 percent of the total U.S. population, Nextlink is the licensee for both the A3 and B block spectrum and could aggregate 300 megahertz of spectrum at 31.0-31.3 GHz.³⁰ If the United States is to truly lead in 5G, **it cannot afford to orphan the 450 megahertz of spectrum available in the A2, A3 and B bands – or a full one-third of the 28 GHz band.**

Fracturing the 28 GHz band will also increase the costs for Nextlink to obtain equipment that can operate using the A2 and A3 bands and the B block.³¹ It would be inefficient for manufacturers to build, and service providers to purchase and deploy, equipment that does not currently include these spectrum bands, only to turn around and remanufacture, repurchase and redeploy new equipment a year or two later after this spectrum is presumably allocated for flexible use. Similar to a "dig once" policy, the FCC should promote a "deploy once" policy for equipment that will ultimately use the 28 GHz band for 5G services.

Alignment of LMDS Renewal and Substantial Service Deadlines

At an absolute minimum, the FCC should align the renewal dates and substantial service deadlines for the A1/A2/A3 band and B block licensees. As noted in the timeline included in the presentation, 5G fixed and mobile standards are targeted for a 2019 completion, equipment development and production schedules will follow and the deployment of installations, covering multiple use cases, will continue throughout the next decade stretching into 2028.³² Setting a 2022 performance deadline for incumbents would be fundamentally unfair based on the current expectations for standards setting and equipment availability. Instead, the Commission should treat new and incumbent licensees alike. Nextlink therefore urges the FCC to harmonize the LMDS renewal dates with the anticipated deployment of operations under the new UMFU standards and

²⁸ See, e.g., Comments of Ericsson Inc., GN Docket No. 14-177, *et al.* at 37 (filed Jan. 15, 2015).

²⁹ See Reed Engineering, *Maximizing the Utility of the Upper Microwave Flexible Use Service Bands Via Licensee Flexibility and Sound Spectrum Usage Policies* 7 (Jan. 28, 2016), attached to Comments of XO Communications, LLC, GN Docket No. 14-177, *et al.* (filed Jan. 28, 2016).

³⁰ See attach. at 10.

³¹ See *Nextlink June 21 Ex Parte* at 6.

³² See attach. at 12.

maintain the precedent of 10 year renewals. The FCC should include such an extension in writing in its order modifying LMDS geographic license areas.

Radical Modifications to LMDS Licenses Will Disrupt Licensees' Reasonable, Investment-Backed Expectations

Finally, Nextlink highlighted the unorthodox nature of the Commission's proposal to simultaneously reduce the size of geographic license areas and enhance the performance requirements of incumbent licensees while splitting the A1 license into two blocks. In past spectrum proceedings the FCC has provided incumbent licensees with greater flexibility (including mobility) without adopting such smaller geographic licensing areas or more stringent build-out requirements.³³ In other cases where the FCC reallocated spectrum for mobile or flexible use, the Commission reduced the level of construction required in the markets or granted licensees more time to meet existing build-out requirements.³⁴

The Commission's proposed new UMFU licenses would alter the buildout requirements and renewal expectations in ways that seriously damage incumbent licensees and are *per se* unreasonable without an express statutory authorization to adopt retroactive rules.³⁵ Additionally, the FCC's rules, if adopted, would affect the desirability of Nextlink's past transactions, including its acquisition of the licenses in the first instance and its determinations in building out its existing licenses.³⁶ Subdividing existing LMDS licenses would affect the substantive operating rights and obligations of incumbent licensees.³⁷ Indeed, imposing such stringent license obligations years after

³³ See, e.g., *Amendments to Parts 1, 2, 27 and 90 of the Commission's Rules to License Services in the 216-220 MHz, 1390-1395 MHz, 1427-1429 MHz, 1429-1432 MHz, 1432-1435 MHz, 1670-1675 MHz, and 2385-2390 MHz Government Transfer Bands*, Report and Order, 17 FCC Rcd 9980, 10010 ¶¶ 72-73 (2002).

³⁴ See, e.g., *Amendment of Part 27 of the Commission's Rules to Govern the Operation of Wireless Communications Services in the 2.3 GHz Band*, Report and Order and Second Report and Order, 25 FCC Rcd 11710 (2010), recon., *Order on Reconsideration*, 27 FCC Rcd 13651 (2012); *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).

³⁵ See, e.g., *Bowen v. Georgetown Univ. Hosp.*, 488 U.S. 204, 219-20 (1988) (Scalia, J., concurring) (discussing secondary retroactivity and quoting with approval prior precedent that "[a]ny implication by the FCC that this court may not consider the reasonableness of the retroactive effect of a rule is clearly wrong.") (citation omitted).

³⁶ See, e.g., *Nat'l Mining Assoc. v. Dept. of Labor*, 292 F.3d 849, 867 (D.C. Cir. 2002) (explaining that "a provision operates retroactively when it 'impairs rights a party possessed when he acted, increases a party's liability for past conduct, or imposes new duties with respect to transactions already completed.'") (citation omitted).

³⁷ The Commission has also stated that adoption of the rules would not trigger a "modification" of the licenses under Section 316 of the Communications Act. See *NPRM*, 30 FCC Rcd at 11913-14 ¶ 115 n.241. But the one case cited is not analogous to the facts at hand. See *id.* (citing *Review of the Spectrum Sharing Plan Among Non-Geostationary Satellite Orbit Mobile Satellite Service Systems in the 1.6/2.4 GHz Bands*, Report and Order, Fourth Report and Order, and Further Notice of Proposed

the licensed spectrum has been auctioned and deployed would be unfair to auction winners and interfere with their reasonable investment-backed expectations, raising serious concerns that such actions would be considered a regulatory taking.³⁸

Pursuant to Section 1.1206(b) of the Commission's rules, I am filing this letter electronically in the above-referenced docket. Please contact me directly with any questions.

Respectfully submitted,

Michele C. Farquhar
Partner

Counsel to Nextlink Wireless, LLC and
XO Communications, LLC
Michele.farquhar@hoganlovells.com
D 1+ 202 637 5663

Enclosure
cc (via email):

Edward "Smitty" Smith
Ariel Diamond
Johanna Thomas
Brendan Carr

Rulemaking, 19 FCC Rcd 13356, 13393 ¶ 85 (2004)). Adoption of the Commission's proposals without a hearing could deprive existing licensees of due process.

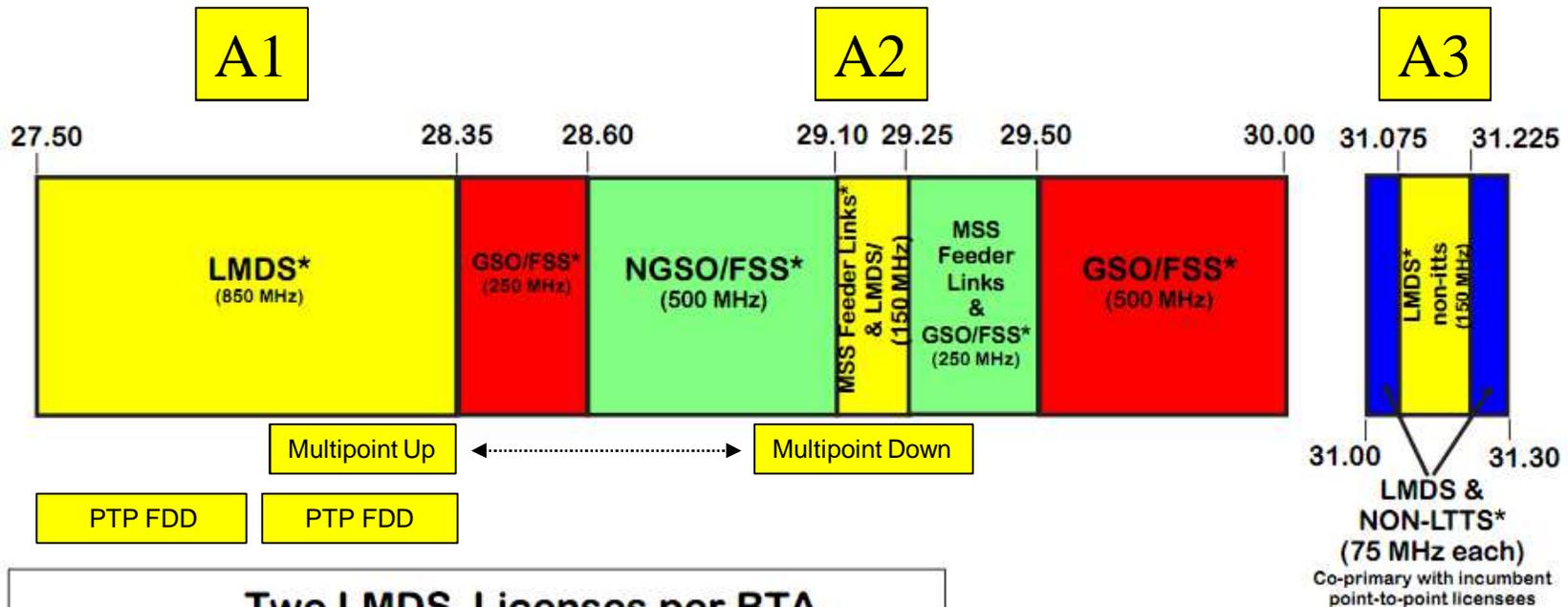
³⁸ See, e.g., *Penn. Central Transp. Co. v. New York City*, 438 US 104, 124-25 (1978) (Courts will assess whether an agency action results in a regulatory taking by considering the following factors: (1) the economic impact of the regulation, (2) the extent to which the regulation interferes with distinct investment-backed expectations, and (3) the character of the government action.).

Spectrum Frontiers: Licensing Challenges

June 28, 2016



FCC Defined LMDS Band Plan



Two LMDS Licenses per BTA

Block A - 1150 MHz: 27,500-28,350 MHz
 29,100-29,250 MHz

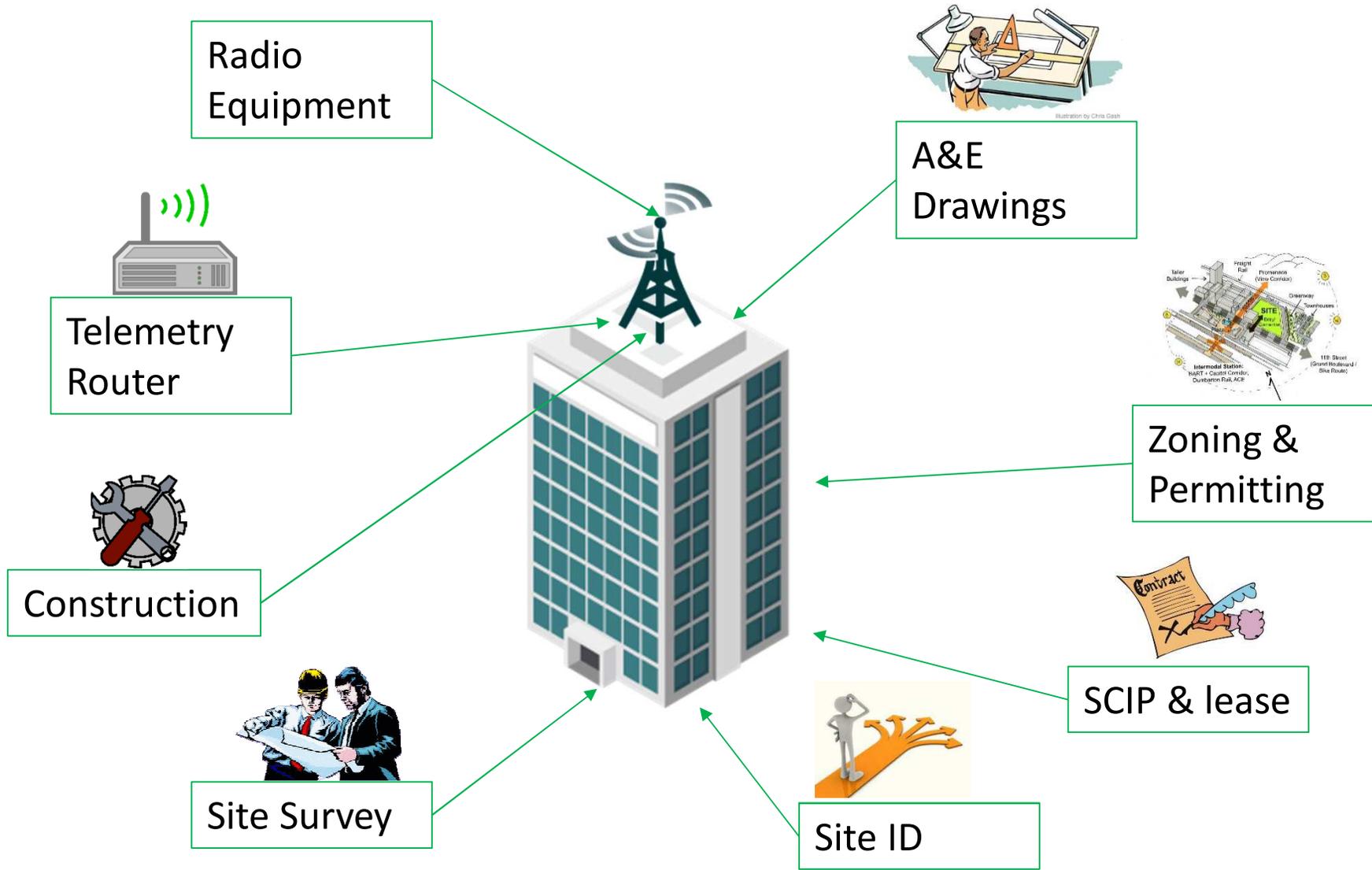
Block B - 150 MHz: 31,000-31,075 MHz
 31,225-31,300 MHz

Legend

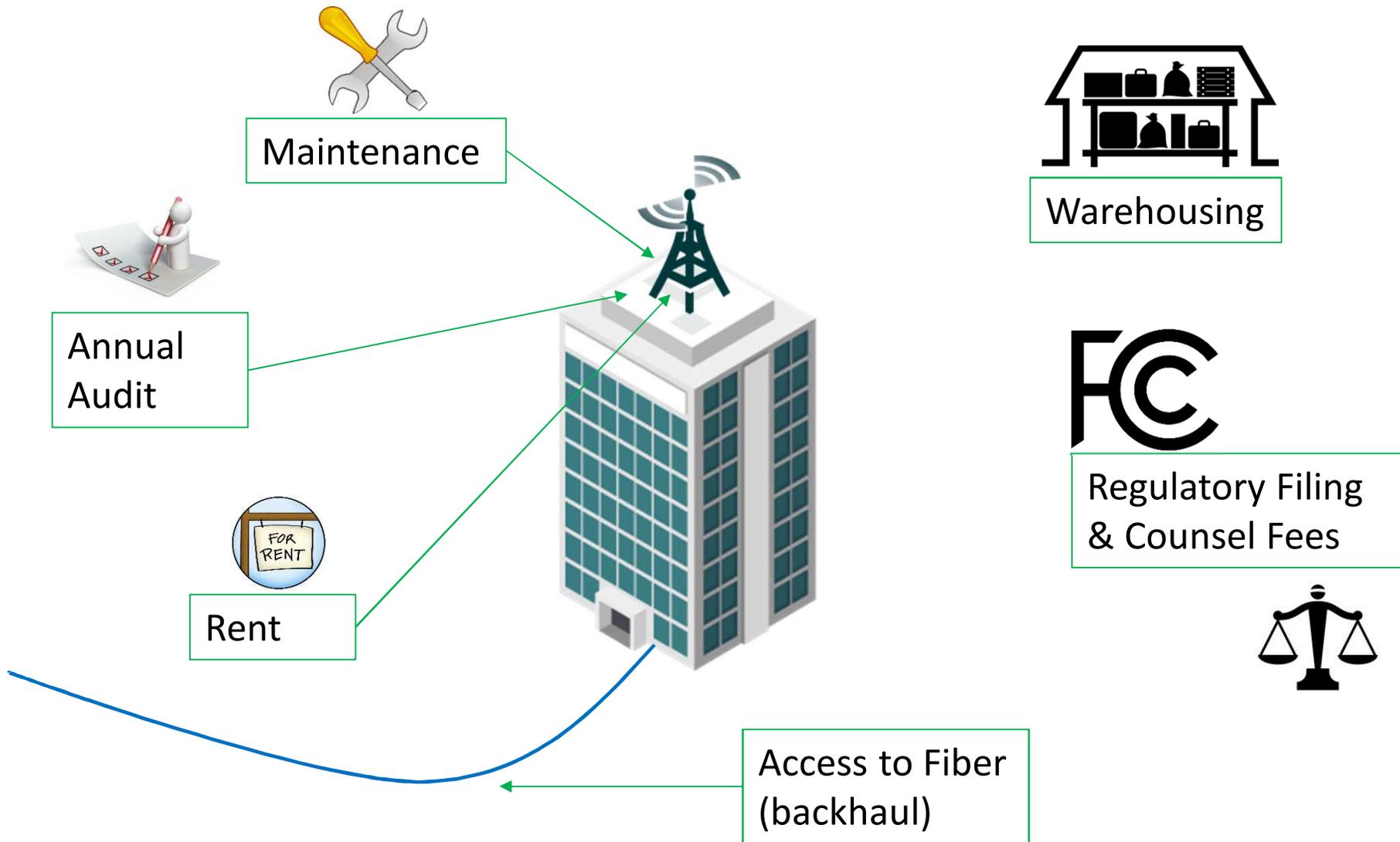
- *** - Primary Service
- FSS - Fixed Satellite Service
- GSO - Geostationary Orbit
- NON-LTTS - Non-Local Television Transmission Service
- MSS - Mobile Satellite Service
- NGSO - Non-Geostationary Orbit

B

Typical Build – Expected CapEx



Typical Build – Expected OpEx

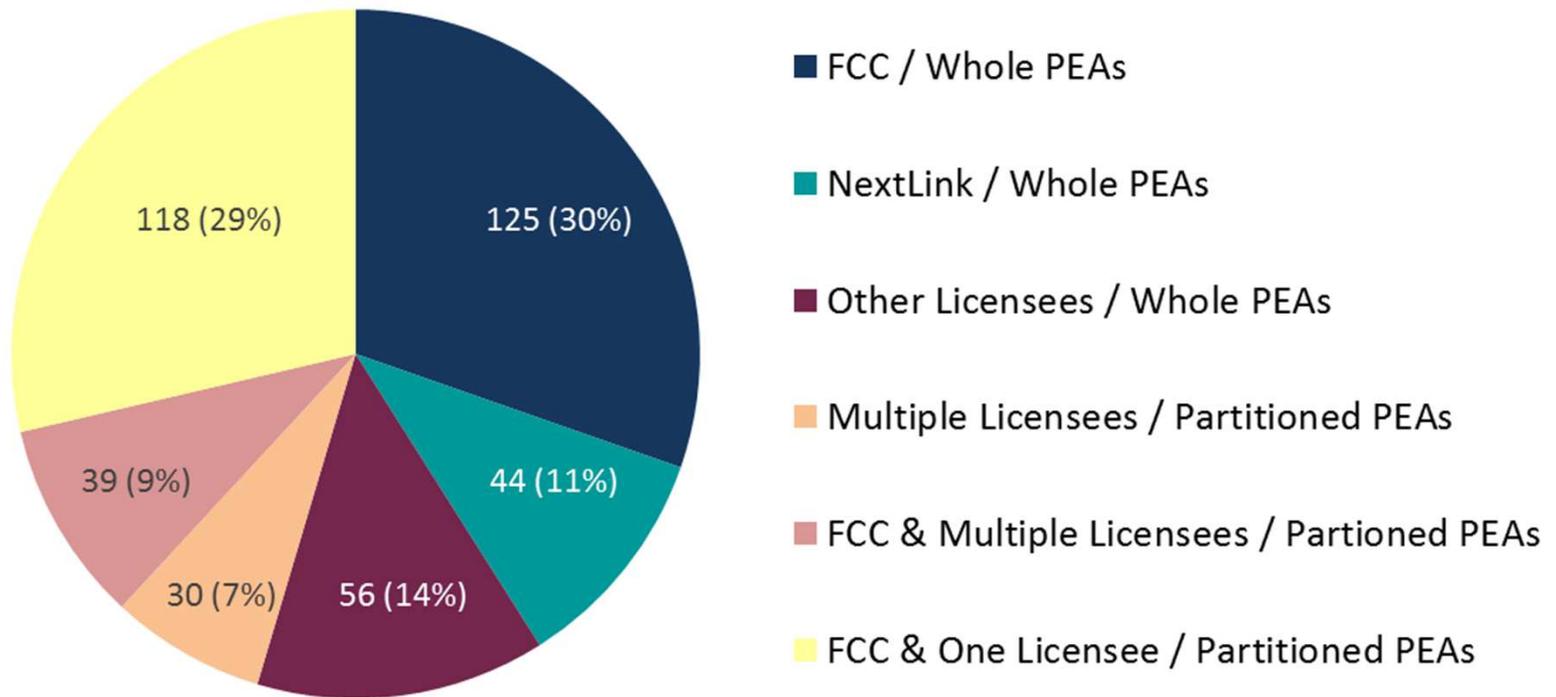


	Basic Trading Areas (BTAs)	Counties (and county equivalents)	Partitioned PEAs	Partial Economic Areas (PEAs)
Number of License Areas	489*	3,221	651	412*
Number of Nextlink License Areas	93	767	153	n/a
Average Population Across Area	639,001 ⁺	97,011 ⁺	479,987 ⁺	750,231 ⁺
Median Population Across Area	228,660 ⁺	26,076 ⁺	155,675 ⁺	298,749 ⁺
Average Number of Counties per Area	6.59	n/a	4.95	7.82

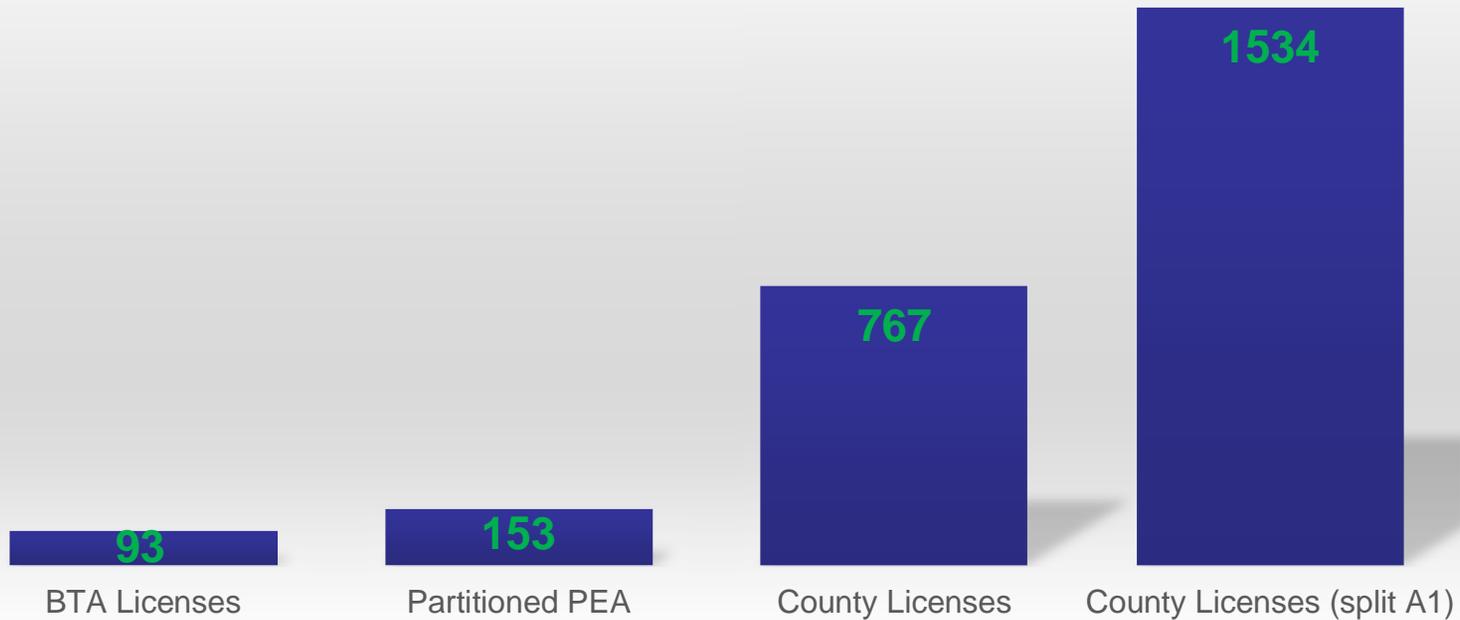
*These figures do not include the territories of Guam, the U.S. Virgin Islands, American Samoa, the Northern Mariana Islands or the Gulf of Mexico

⁺Information based on 2010 United States Census Bureau data

Proposed PEA Conversion Plan - Results by Number of PEAs

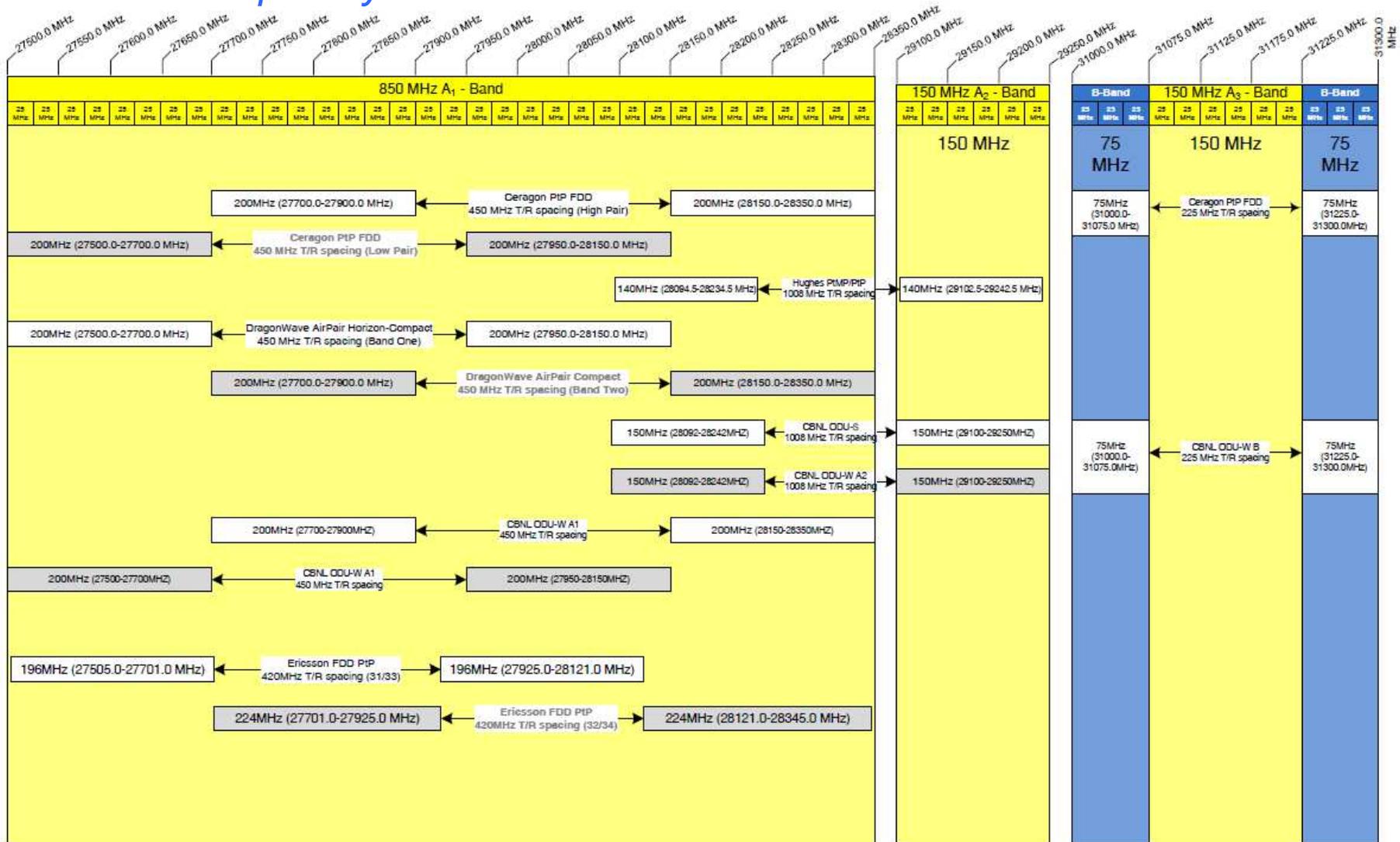


Number of Nextlink licenses today v. alternative proposals



LMDS Sub-Band plan

Developed by Nextlink and Vendors



- Nextlink developed a standard sub-band plan in conjunction with radio manufacturers for ease of spectrum planning and interference management.
- Multipoint vendors typically use a 1008 MHz ETSI FDD spacing with the downlink in the A2 band and uplink in the A1 band.
- Point-to-Point vendors conform to a 450 MHz FDD spacing in the A1 band. There are also B band FDD Point-to-Point radios.
- Nextlink's lease customers conform to either the all A1 FDD spacing or the A1/A2 FDD spacing.
- All of Nextlink's A band Point-to-Multipoint installations (in almost all A band BTAs) use the A1/A2 FDD spacing.
- Current LMDS use cases are expected to play a major role in future 5G deployments (e.g., wireless backhaul).
- Breaking up the A1 band into separate licenses and/or separating the A1 and A2 bands will eliminate existing deployment scenarios.
- New licensees for "half" of new A1 band will have no FDD equipment available, and may not be able to deploy without controlling both halves of the split band.

- 300 MHz of contiguous spectrum is available for mobile 5G in the combined A3 and B blocks.
- Nextlink controls the A3 and B blocks in many markets – including New York, Los Angeles, Chicago, Washington, DC, Atlanta, Detroit and Boston – covering 28.5% of the U.S. population.

<i>City</i>	<i>Population*</i>
New York	20,264,298
Los Angeles	17,895,552
Chicago	9,461,105
Washington, DC	5,543,091
Atlanta	5,450,974
Detroit	4,836,176
Boston	4,552,402
Minneapolis	3,606,470
St. Louis	2,999,346
Baltimore	2,768,468
Others	10,553,979
Total (28.5%)	87,931,861
Rest of U.S.	220,813,677

* Based on United States Census Bureau 2010 Census April 1, 2010

- Bandwidth concerns are not a legitimate basis for excluding the A2, A3, and B Blocks from the UMFU framework
- With only 200 MHz of spectrum (100 MHz downlink, 100 MHz uplink), 5G data rates can achieve greater than 3 Gbps throughput.
- The A3 and B Blocks provide 300 MHz of contiguous spectrum and would provide ample bandwidth to support 5G services.
- A data rate of more than 1 Gbps is achievable over a 100 MHz channel even with 4G air interface specifications. Much higher data rates would be achievable with 100 MHz spectrum with 5G air interface specifications.
- The Spectrum Frontiers Fact Sheet indicates that two band segments of only 200 MHz each will be considered in the FNPRM. Specifically, in the 24-25 GHz band, 24.25-24.45 GHz and 25.05-25.25 GHz are each only 200 MHz wide – this is smaller than A3+B.

5G LMDS Timeline

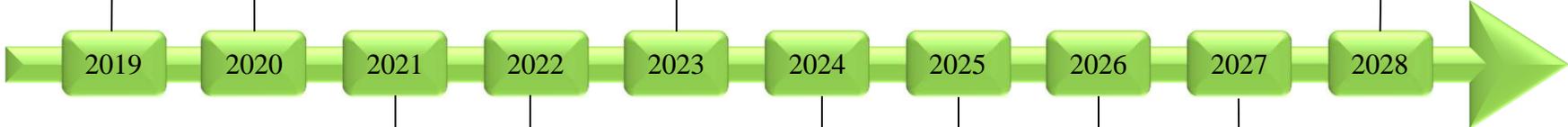
3GPP completes the Fixed and Mobile 5G standard

The industry absorbs the standard and begins design work on devices for fixed and mobile devices

- Multiple use case supported: vehicles, sensors, fixed, last mile, security, mesh, etc

Field testing of prototypes and testing of business models and user acceptance. Approach other holders of LMDS to coordinate equipment orders

File for performance requirements



Nextlink establishes agreements and business models with new vendors for deployments of new use cases

Equipment developed with first prototypes available.

Identify deployment partners and complete field testing of prototypes and testing of business models and user acceptance. Order equipment.

Begin deployment of use case-supported installations in key locations.

Expand deployments throughout the Nextlink footprint.

Complete deployments in all locations.