

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

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| <b>In the Matter of</b>                          | ) |                             |
|  | ) |                             |
| <b>Promoting Investment in the 3550-3700 MHz</b> | ) | <b>GN Docket No. 17-258</b> |
| <b>Band</b>                                      | ) |                             |
|  | ) |                             |
| <b>In The Matter of</b>                          | ) |                             |
|  | ) |                             |
| <b>Advisory Committee To Promote Diversity</b>   | ) | <b>GN Docket No. 17-208</b> |
| <b>And Digital Empowerment</b>                   | ) |                             |

**REPLY COMMENTS OF MILE ONE BROADBAND CONSORTIUM  
IN GN DOCKET NO. 17-258**

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## SUMMARY

Mile One Broadband Consortium (hereafter “Mile One”) submits this reply comment on the proposed rules for the Citizen’s Broadband Radio Service in response to proceedings on the Notice of Proposed Rulemaking (NPRM) in GN Docket 17-258 (“PALs NPRM”). Mile One is a pre-deployment licensee in the 3.65 GHz band (call sign WQLU292), and has invested eight years in research and development on digital divide use case models for the 3650 – 3700 band. To date, Mile One has deferred to policy positions advocated by the Wireless Internet Service Providers Association (WISPs). On this occasion, Mile One comments separately to disclose cost benefit information relating to digital divide use cases for distressed urban core areas and to recent changes to the underwriting standards for broadband lending, investment and service programs (hereafter “BLIS programs”). See, Community Reinvestment Act of 1978, 12 U.S.C. 2901.(instructing financial institutions to meet the credit need of low and moderate income (LMI) communities in which they are chartered, consistent with safe and sound banking principles) (hereafter “CRA”). Mile One’s reply comment also discusses the cost benefit implications of an intervening legal decision that expresses relevant judicial viewpoints on the nature of the property rights that are associated with the wireless licenses the Commission seeks to allocate in this proceeding. See, *Alpine PCS v. United States*, Case No. 2017-1029 (Fed. Cir. January 2, 2018).

By all indications, Mile One submits that future implementation of digital divide use cases will benefit greatly from broadband lending, investment and services programs by federally supervised depository institutions. This factor alone weighs in favor of modifications to align the baseline scenario for the Citizens Broadband Radio Service (CBRS) band with the use of safe and sound underwriting standards and banking practices. To focus on the risk of a net

social cost from auction-only licensing in the priority access tier based on Partial Economic Areas, Mile One confines its reply comments to measures that will robustly incentivize broadband lending, investment and service programs by federally supervised depository institutions. Ultimately, Mile One supports a modification of the baseline scenario to provide for shared access in the priority access tier under a form of administrative incentive fee licensing, secondary market opportunities in the priority access tier, flexible treatment of consortium-based spectrum sharing arrangements in accordance with the baseline provided in 47 CFR 1.2110(b) (4), and reconsideration of the Commission's abstention from the issuance of wireless tax certificates on a case by case basis under the auspices of the existing declaratory ruling process.

**I. VARIOUS EXTERNALITIES CONSTRAIN EFFICIENT USE OF COMMUNITY REINVESTMENT ACT FUNDING FOR BROADBAND LENDING, INVESTMENT, AND SERVICES TO BRIDGE THE "DIGITAL DIVIDE."**

In this proceeding, the Commission seeks to promote the delivery of wireless services to the American people, and to enhance global competitiveness. According to the NPRM, it has become increasingly apparent since 2015 that the 3.5 GHz Band will be a core component of next-generation network deployments throughout the world. To maintain U.S. leadership in the marketplace for wireless services, the Commission concluded that service rules for the CBRS band should change to keep up with technological advancements, create incentives for investment, encourage efficient spectrum use, and promote robust network deployments. See also, In the Matter of Amendment of the Commission's Rules with Regard to Commercial Operations in the 3550-3650 MHz Band, Report and Order and Further Notice of Proposed Rulemaking in GN Docket 12-354, FCC 15-47\_\_\_ FCC Record \_\_\_ ("2015 Report and Order")..<sup>1</sup>

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<sup>1</sup> The baseline scenario for the CBRS band set forth in the PALs NPRM include the following elements: (1) an extension of license terms and adding the possibility of a license renewal expectancy;(2)

Recent banking regulations published by the Federal Reserve, the Office of the Comptroller of the Currency, and the Federal Deposit Insurance Corporation offer direct insights for this aspect of the PALs NPRM docket. The guidance provided by the supervisory agencies confirms, first the first time, that investing in communications infrastructure is consistent with the CRA regulatory definitions of community development because it “helps to meet essential community needs.”<sup>2</sup> Findings by Federal Reserve offices at the regional level are equally instructive..<sup>3</sup> The latter attest to the fact that “[t]he CRA provides a significant opportunity to help close the digital divide across communities while simultaneously benefiting financial institutions and improving economic stability.” Dallas Federal Reserve Report, Id.

One major trend revealed by Federal Reserve data is the intersection of connection disparities along class lines in numerous cities in both rural and urban areas, coupled with connection disparities along racial lines, in practically all geographic areas and all household income brackets. For example, a report issued by the Federal Reserve Bank for the Dallas, Texas points to fifty cities in rural and urban areas where approximately 20% or more of low and middle income households (LMI) households have no internet connections. Dallas Federal

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an expansion of the PALs coverage areas to include larger geographic license areas; (3) a sweeping expansion of the rules governing PAL auctions; (4) a revision of the secondary markets rules to allow partitioning and disaggregation of PALs; (5) revision of technical rules to facilitate wider bandwidth operations; (6) exemptions from public disclosure requirements for registration information to protect critical infrastructure and safeguard competitively sensitive information. Cf., *Florida Cellular Mobile Communications Corp. v. FCC*, 28 F.3d 191, 196-97 (D.C.Cir.1994), cert. denied, \_\_ U.S. \_\_, 115 S. Ct. 1357, 131 L.Ed.2d 215 (1995) (affirming change in rules as reasoned response to Commission experience).

<sup>2</sup> “Interagency Questions and Answers Regarding Community Reinvestment,” Federal Register, Vol. 81, No. 142, Monday, July 25, 2016; see also, “Recommendations on the Community Reinvestment Act” of the Advisory Committee on Diversity for Communications in the Digital Age dated December 10, 2004 ) (proposing clarification of underwriting standards for “qualified investment” presumption).

<sup>3</sup> See, “Closing the Digital Divide: A Framework for Meeting CRA Obligations,” Federal Reserve Bank of Dallas, (July 2016; Revised December 2016). “U.S. Cities with 100,000+ Households Ranked by ‘Worst Connection’: Median Household Incomes vs. Percent of Households With No Internet Access”), and Shruthi Arvind and Kyle Fee, “Broadband and High-speed Internet Access in the Fourth District,” A Look Behind The Numbers, Federal Reserve Bank of Cleveland, Vol. 7, Issue 2, December 8, 2016.

Reserve Report, *supra* n. 3, p. 1. A similar report of the Federal Reserve Bank for Cleveland, Ohio addressing differences in internet access among selected counties in the Fourth District notes with respect to a plurality of those counties that “the lowest penetration rates (less than 40 percent of households with internet access) are found in the urban core,” and finds on that basis that “greater support for investments in broadband and internet access is warranted in 9 of the 10 largest counties in the Fourth District,” Cleveland Federal Reserve Report, *supra* n. 3, pp. 5 and 10. While structural constraints on price competition would ordinarily account for disparities on the basis of income, connection disparities along group lines in the same income bracket are not easily explained - if at all – solely by data reporting income of similarly situated households. FCC reports also point to structural externalities suggesting disparate outcomes.<sup>4</sup>

Consistent with the thrust of Federal Reserve underwriting criteria, the Commission originally stated that it intended to encourage the deployment of networks by incumbent licensees that can attract “substantial investment” and “provide socially productive service,” 2015 Report and Order, para 402. CRA-related criteria are closely aligned with the FCC’s stated interests in “substantiality” and “productivity” in the CBRS context. As recognized in the Federal Reserve report, infrastructure investment under the CRA covers the entire eco-system for wireless deployment insofar as it includes “facilitating the construction, expansion, improvement, maintenance or operation of essential infrastructure or facilities ... An investment or loan applied to broadband infrastructure would need to be for the purpose of serving LMI individuals and/or geographies or revitalizing or stabilizing an LMI geography or nonmetro

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<sup>4</sup> Mile One relies heavily on findings and conclusions about regulatory externalities that appear in two reports published by the FCC: “Whose Spectrum Is It Anyway: A Report To The Federal Communications Commission On Market Entry Barriers, Discrimination and Changes in Broadcast and Wireless Licensing,” FCC Office of General Counsel, December 2000; and “Strategies and Recommendations for Promoting Digital Inclusion,” Consumer and Governmental Affairs Bureau, Federal Communications Commission, January 11, 2017.

middle-income geography.” *Id.*, p. 3. Under the CRA, moreover, banks retain discretion to accomplish broadband deployment goals with specialized programs for lending, investment and services that range from alternative underwriting standards and equity investments to collaboration and pooling arrangements with third party intermediaries. To mitigate externalities that could plausibly impair CRA funding to promote investment in the 3550 to 3700 band, the Commission can and should revisit the cost benefit profile of the current baseline scenario.<sup>5</sup>

## **II. THE USE OF DE FACTO QUOTAS TO ALLOCATE A SMALL NUMBER OF LICENSES IN LARGE “PARTIAL ECONOMIC AREAS” PLACES THE CBRS BAND AT RISK FOR A “TRAGEDY OF THE ANTI-COMMONS” PROBLEM THAT INVOLVES A NET SOCIAL COST TO THE PUBLIC INTEREST.**

### **A. The Proposed Model For Cost Benefit Analysis**

The Commission requested comment on whether the economic impact of the baseline scenario justifies the adoption of the PALs NPRM as a final rule.<sup>6</sup> Framing the cost benefit model to evaluate technical efficiency, economic efficiency and socio-economic benefits, Mile One uses cost benefit modeling to inquire whether an auction design that institutes a quota system favoring the dominant wireless providers is likely to lead to pareto efficient outcome with respect to the implementation of digital divide use case scenarios. Mile One concludes that the new baseline scenario imposes a net social cost on the economy because the social cost that flow from using a quota system probably exceed benefits to technical efficiency benefits of spectrum sharing in the 3550-3700 band, and because a less restrictive alternative for spectrum sharing

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<sup>5</sup> See, Mark Willis, “It’s the Ratings, Stupid, A Bankers Perspective On the CRA,” in *Revisiting the CRA: Perspectives on the Future of the Community Reinvestment Act.* For example, Willis notes that advances in information technology increase access to banking services for LMI individuals and small businesses by supporting the feasibility and cost effectiveness of platforms for innovative and highly scalable loan origination, production and servicing operations, and ultimately, by enabling banks to serve people and businesses with a wider range of credit histories at a lower cost) (available on-line.

<sup>6</sup> See, Caroline Cecot, “Make Economics at the FCC Great Again,” Technology Policy Institute, April 14, 2017; and see Gerald R. Faulhaber, Hal J. Singer, & Augustus H. Urschel, *The Curious Absence of Economic Analysis at the Federal Communications Commission: An Agency in Search of a Mission*, 11 *Int’l J. Comm’n* 1214, 1222 (2017).

alternative is available that is less costly in terms of economic efficiency and social benefits. Herein lies the “tragedy of the anti-commons” problem.<sup>7</sup>

## **B. Probable Positive Externalities Of The Baseline Scenario**

Regarding positive externalities, Mile One assigns a positive value to the technical efficiencies that will likely be secured by a baseline scenario that retains a regulatory framework for the sharing of spectrum between a public sector consisting of incumbent federal military users and a private sector consisting licensed and unlicensed civilian users in general. The underlying spectrum sharing regime preserves a solution to a long standing dilemma over whether to continue military domination of the 3650 MHz band, or to institute sweeping reallocations of military spectrum and the clearing of the federal licensees. Compared to the legacy of the command and control era policies of the 20<sup>th</sup> century, the U.S. success in allocating of spectrum on a non-exclusive basis with renewal expectancies for the wireless broadband service in 2005 - coupled with large scale testing, CBRN market trials, and recent reductions in the size of exclusion zones that the United States uses to protect incumbent federal users – all serve to confirm that substantial technical efficiency gains are likely to flow from allocating

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<sup>7</sup> More specifically, Mile One defines the tragedy of the anti-commons as rote over-reliance on property rights models advocated by Ronald Coase in “The Federal Communications Commission,” *The J. of L. and Econ.*, Oct. 1959 2; cf., Thomas W. Hazlett, David Porter, & Vernon Smith, “Radio Spectrum and the Disruptive Clarity of Ronald Coase,” *George Mason University* 10-18 (arguing for allocational efficiency), and Paul s. Ryan, “Treating the Wireless Spectrum as a Natural Resource,” 35 *ELR* 10620 (2005) (citing Coase, *The Problem of Social Cost*, 3 *J.L. & Econ.* 1 (1960) to support arguments against spectrum under-utilization). A neutral framework for analyzing cost benefit issues for the regulation of new telecommunications services which Mile One has examined assumes that consumer surplus is equal to roughly half of the value of the projected demand curve for the new telecommunications service. See, Hausman, “Valuing the Effects Of Regulation on New Services in Telecommunications,” *Brookings Papers, Microeconomics* 1999 (presenting a framework to estimate social costs from the loss of consumer surplus traceable to regulatory externalities that caused delay in the deployment of cellular telephone services) (available online). When multiplier effects of increased product variety made possible by new internet technologies are taken in to account, other models estimate that the value of new internet technology is possibly five times greater as a source of gains in value for consumer welfare than the direct economic impact of lower retail selling prices alone. See also, E. Brynjolfsson, M.D. Smith and Y.J. Hu. “Consumer Surplus in the Digital Economy: Estimating the Value Of Increased Product Variety,” (available online).



spectrum in the 3550 – 3700 band under a “Spectrum Access System” scheme to create new opportunities for investment and innovation for small cell deployments.

In the current state of the record, reasonable minds differ on the efficacy of a baseline scenario that utilizes a small number of large licensing areas on terms that approximate a size based quota system. On one hand, an auction scheme predicated on size based quotas has plausible economic efficiency benefits for the dominant wireless providers insofar as a quota system might deter bidding by entities that value spectrum mainly for rent seeking purposes. On the other hand, an auction scheme predicated on size based quotas unnecessarily constrains the flexibility of the proposed spectrum sharing scheme. As noted by expert industry commentators, “Depending on the local situation, type of incumbent and the associated deployment density, regulators may consider either spectrum clearing or sharing, or a combination of the two... In case of a need for flexible coordination between [International Mobile Telecommunications (IMT) service providers] and incumbents ... to protect a limited number of stations, a License Shared Access approach or similar [approach] should be considered. This may enable a roll-out on a national basis while protecting certain locations or areas to guarantee interference free operation of remaining incumbent stations.” GSA Spectrum Group, THE FUTURE OF IMT IN THE 3300-4200 MHz FREQUENCY RANGE, pp. 31 - 34 (June 2017).

Mile One assigns weight to the inference that market forces are probably already quite adequate to incentivize dominant entity participation in emerging the mobile video services marketplace. The proposition that size based quota will more likely than not limit rather than enlarge economic efficiencies and social benefits that flow from the new baseline scenario is further highlighted by data showing that the four nationwide wireless service providers account for slightly less than 100% of total industry revenues. See, Annual Report and Analysis of

Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services, WT Docket No. 16-137, DA 16-1061, September 23, 2016 (“Nineteenth Report”), para. 19 – 20; see especially, Table II.C.1 Service Revenues for Mobile Wireless Service Providers (\$ millions), 2007–2015 and Table II.C.2 Market Shares for Mobile Wireless Service Providers Based on Service Revenues, 2012–2015, reproduced in Appendices B and C. According to the Nineteenth Report, the four dominant nationwide service providers typically engage in non-price forms of competition after acquiring spectrum from auctions or secondary market transactions by upgrading networks in existing markets by expanding network capacity through increased investment in their existing assets and infrastructure, rather than by expanding into new geographical areas. *Id.* para. 23; see also, “Chart II.D.1 Capital Expenditure by U.S. Mobile Wireless Providers 1Q12-4Q15,” reproduced in Appendix D. Because the baseline scenario omits to include provisions for licensed shared access for non-exclusive licensing in the priority access tier, and essentially replicates incentives for investment and innovation supplied by market forces, Mile One assigns a positive value for technical efficiency, but not for economic efficiency and social benefits.

### **C. Probable Negative Externalities Of The Baseline Scenario**

To evaluate costs of exclusion, Mile One employed a cost model that assigns negative values for transaction costs, opportunity costs for consumers and producers, hidden costs for the economy at large, and potential constitutional costs for the taking of 3650 MHz licenses without just compensation. Mile One concludes that the new baseline scenario warrants an assignment of negative values for economic efficiency and socio-economic benefits because it fails to employ a more dynamic approach to spectrum sharing to address objections to an anti-competitive market

environment in which consumer surplus diminishes in digital divide communities in proportion to the large scale of the return on investment that is expected by the dominant wireless providers.

An effective model for valuing social costs must start by first taking relevant transaction costs into consideration. On this point, Mile One agrees with the Commission's observation CAPEX trends that "access to capital may be more constrained for some service providers," and that this may ultimately require "reallocation of their investment." Nineteenth Report, para. 20. In fact, the latter finding probably understates the problem insofar as it coincided with data showing sharp declines among large non-dominant service providers, with the non-dominant market shares declining from 50% in 2003 to less than two percent in 2015. See, "Chart II.C.1 U.S. Mobile Wireless Connections: 2003–2015" reproduced in Appendix E. Overall, excessive transaction costs from competitive bidding requirements,<sup>8</sup> coupled with complexities pertaining to the permissibility of pledging spectrum licenses as collateral,<sup>9</sup> reflect poorly on accommodations for the credit needs of digital divide use case adopters.

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<sup>8</sup> See Ayres and Crampton, "Deficit Reduction Through Diversity: How Affirmative Action at the FCC Increased Auction Competition" (1996). Yale Law School Faculty Scholarship Series, Paper 1521 (noting that price inflation from designated entity competition that contributed \$45,000,000 in excess of projections in one auction but that preferences call for justifications other than interests in deficit reduction alone. (available online). But see, Hazlett, Thomas W. and Boliek, Babette E.L. (1999) "Use of Designated Entity Preferences in Assigning Wireless Licenses," Federal Communications Law Journal: Vol. 51: Iss. 3, Article 7. (noting that the structure of the preference programs has encouraged entry of comparatively inefficient telecommunications providers and has led to delay in the provision of telecommunications services to consumers.) In view of past criticisms on one hand, and significant auction-based externalities facing small entities on the other, the governmental interest in diversity of ownership would likely benefit from an incentive methodology that leverages the advantages of bidding credits under the existing spectrum auction policies, and capital gains deferrals under the FCC's former tax certificate program without the perceived disadvantages.

<sup>9</sup> For example, a broadcast business model formulated on linear growth values predicted by Sarnoffs Law differs widely from on-line network business models that are formulated after quadratic growth values predicted by Metcalfe's Law. however, literature on best practices for the underwriting context is still in the embryotic stage. See e.g., Zhang XZ, Liu JJ, Xu Z.W., "Tencent and Facebook data validate Metcalfe's law," JOURNAL OF COMPUTER SCIENCE AND TECHNOLOGY 30(2): 246–251 Mar. 2015. DOI 10.1007/s11390-015-1518-1.

An effective model for valuing social costs must also account for relevant demand-side and supply-side opportunity costs. Regarding demand side opportunity cost factors, “[t]he introduction of new telecommunications services can lead to very large gains in consumer welfare. See, Hausman, *Id.* p. 2. To the extent that the digital divide phenomenon can reasonably be described as an opportunity costs to consumer surplus that has resulted from inefficient “command and control” allocations of telecommunications resources in the past, the baseline scenario threatens to perpetuate the digital divide as much as it promises to alleviate it.<sup>10</sup> Regarding supply side opportunity factors, a licensing scheme that calls for a small number of large geographical area enlarges the risk of a “bidders curse” in cases where the successful bidder pays more for the license than the spectrum is worth, and ultimately the risk of an opportunity cost to producer surplus that carries with it an array of potential negative multiplier effects. “An industry cannot be expected to behave in a manner that is fundamentally inconsistent with its underlying technological and economic characteristics....” *Id.* In an auction-only licensing scheme where returns on investment might be perceived to fall below competitive levels for dominant entities, a large service provider will ordinarily face difficulty in trying to shift its investment to other uses once an investment becomes sunken and irreversible in nature. *Id.* In such cases, “[p]otential competitors ... have economic incentives to attempt to stop or delay introduction of the new service....” *Id.*

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<sup>10</sup> Opportunity costs from losses to consumer surplus are measurable as a percentage of the value assigned to the demand curve of the goods and service in question, Hausman, *supra* at Footnote 1, and as a multiple applied to the value of the underlying value assigned to consumer surplus. See, Brynjolfsson, *supra*, at. Footnote 1. For example. Brynjolfsson, et al present a valuation methodology and empirical estimates to quantify the multiplier effects of the increased “product variety” that is made possible by the internet technology, and conclude that internet technology is possibly five times greater as a source of consumer welfare gains than the direct economic impact of lower retail selling prices alone. It may be that a comparable multiplier effect applies to the aggregate value of network services made possible by a shared spectrum licensing regime that creates opportunities for small entities in rural and urban core areas where distressed LMI communities are present.

Hidden costs are an additional factor that an effective cost model can and should consider. One important hidden cost issue for the baseline scenario put forward by the PALs NPRM relates both to the meaning of the term “digital divide,” and the moral hazard posed by the intersection of the “digital divide” and the “bidders curse” phenomena. For example, guidance on broadband investment released by banking regulators in 2016 which refers to “nonmetropolitan” areas, but omits corresponding language to clarify the treatment of analogous investments for “urban core” areas. This discrepancy not only distorts the value of network deployments targeting economically distressed LMI communities, it signifies that the digital divide use case affects a much larger numerical population than what has heretofore been assumed in this proceeding.<sup>11</sup> Because reasonable minds differ in the banking community about spectrum related investments based on complexities related to collateralization, market-based uncertainties about the proper methodologies for valuation of intangible spectrum assets will create barriers to the implementation of the digital divide use case. In the latter setting, specialized lending, investment and services are less likely to emerge unless effective safeguards are instituted to avert “the tragedy of the anti-commons.”

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<sup>11</sup> Analysis by Tongia and Wilson in "The Flip Side of Metcalfe's Law: Multiple and Growing Costs of Network Exclusion," *International Journal of Communication* (2011) implies hidden costs from an auction-only approach. Metcalfe's law holds that the value of a telecommunications network grows quadratically in proportion to the square of the number of connected users of the system. The upshot of analysis by Analysis by Tongia and Wilson assumes that even in situations where the premise of Metcalfe's law is conceptually valid, income inequality among some part of the excluded population may also accelerate over time as a long term hidden cost of their exclusion, thus distorting the value that Metcalfe's law seeks to predict: "We have modelled that the network-excluded face increasing disparity ... as the dominant/superior network grows. What are less well quantified are the costs of exclusion borne by the included, or society overall. There are numerous [] examples of network exclusion leading to higher societal costs.... Even with limited data, there is evidence that exclusion costs are disproportionate and growing.... " *Id.*, p. 677 – 679 (noting the example that “enormous economic and political opportunities” are lost by people without cell phones and that the cost of exclusion for the excluded community is the value of network inclusion distributed across the remaining population not in the network).

Lastly, an effective cost model must also consider potential constitutional costs of the baseline scenario insofar as it appropriates opportunities from incumbent 3650 MHz licensees and new entrants in order to incentivize investment and innovation by the four nationwide wireless service providers. According to the analytical framework presented by witnesses advocating the repeal of the minority tax certificate in 1995 – a model which construed the minority tax certificate as a race-based quota system – the argument can be made that the baseline scenario proposes a licensing methodology that amounts to quota system. Judicial authority for that analysis appears in the reasoning of the decision on January 2, 2018 of the U.S. Court of Appeals for the Federal Circuit in *Alpine v. United States* which applies federal law taking jurisprudence to an alleged appropriation of wireless licenses which the petitioner initially acquired through competitive bidding. Cf., *Adarand Constructors, Inc. v. Peña*, 515 U.S. 200 (1995) (applying Fifth Amendment strict scrutiny standard of review to invalidate quota system).

Taking as given the *Alpine* court’s assumption of a property interest in FCC licenses which licensees hold as an intangible assets in the nature of a chose in action, the argument can be made that the baseline scenario threatens in effect to appropriate that interest in derogation of a de facto contractual relationship with the FCC. In the current state of the record, the evidence appears insufficient to establish that the quota system in question is narrowly tailored, much less that it furthers a governmental interest that the federal courts recognize as compelling. On the contrary, the proposed licensing quotas are questionable for narrowly tailoring because the dominant-entity beneficiaries of the proposed quota system are already substantially incentivized by market forces to engage in the investment and innovation activities that the quota system seeks to elicit. The proposed licensing quotas are additionally questionable due to its unrelatedness to any articulated governmental interest of a compelling nature insofar as it

unnecessarily burdens implementation of digital divide use cases by non-dominant entities both in rural areas and in urban core areas identified by the Federal Reserve that are populated predominately by members of minority groups.

**D. The “Tragedy Of The Anti-Commons” Problem Indicates A Net Social Cost**

Mile One opposes the licensing quotas embodied by the baseline scenario despite an assignment of positive values for technical efficiency because it implies a net social cost from the “tragedy of the anti-commons” problem – the failure to include safeguards to deter under-utilization of spectrum resources for digital divide use case scenarios. Using a pro forma Metcalfe’s Law valuation, coupled with its own proprietary market research and SWOT analyses, Mile One subjectively estimates that the pro forma value of a non-dominant mobile network with growth rates on par with Metcalfe’s Law will reach approximately \$48 million dollars at the conclusion of twenty year period, of which roughly \$25 million approximates present equivalent value before CAPEX and OPEX charges and adjustments for inflation. Scaling the opportunity costs of the baseline scenario against a base that includes 49 other urban and rural locations identified by Federal Reserve Bank of Dallas, Mile One arrives at a figure of \$1.25 billion as a proxy value for the total opportunity cost associated. The latter believed to exceed the value of technical efficiency gains from the change of regulatory position because quotas defeat the purpose of spectrum sharing objectives.

**III. RELIANCE ON A “SYNCHRONIZED SHARED ACCESS” PROTOCOL CONSTITUTES A PARETO EFFICIENT ALTERNATIVE FOR ALLOCATING PROTECTION AGAINST INTERFERENCE IN THE PRIORITY ACCESS TIER THAT ALIGNS WITH “FLEXIBILITY OF USE” CRITERIA IN 47 U.S.C. 303(Y).**

The Commission has sound authority to entertain the broadening of its baseline scenario for spectrum sharing to include a U.S. version of the “licensed shared access” concept developed by European regulators to allocate protection against interference to qualifying entities in all or

part of the bandwidth for the priority access tier. Section 303(y) of the Communications Act expressly authorizes the FCC to provide for “flexibility of use” after determining, upon public notice and comment, that flexibility will further the public interest, will not deter investment in communications services and systems, and is consistent with international treaties. 47 U.S.C. § 303(y) (2000). Applying the latter criteria, it appears that adding a “licensed shared access” layer assures pareto efficient flexibility of use in the priority access tier on terms that meet all three criteria and thereby increases the amount spectrum available to non-dominant service providers with which to experiment with the deployment of 5G technologies. The argument can be made in contrast that the quota system implied by the current baseline scenario falls short under the first prong due to “tragedy of the anti-commons” effects that impair economic efficiency and social benefits for reasons explained before.

**A. It Serves The Public Interest To Establish A Zone In The Priority Access Tier For Continuing Use By Qualified Non-Exclusive Nationwide Licensees.**

The first prong of Section 303(y) requires a findings that the proposed flexibility measure operate in furtherance of the public interest. Careful examination of the industry case for licensed shared access reveals that this approach is highly compatible with the public interest criteria set forth in Section 303(y) of the Communications Act.

The GSA defines [Licensed Shared Access] as complementary way of authorising and accessing spectrum, in addition to licensed (exclusive) and license-exempt (unlicensed), which enables the sharing of spectrum between a limited number of licensed users. ... Under a specific regulatory framework, the non-mobile incumbent could allow non-interfering use of part of its assigned spectrum by a mobile operator, pursuant to a commercial agreement with the incumbent and subject to the terms defined by the relevant government authority...The LSA concept allows continued use of spectrum for the incumbent, while providing potential use of the same spectrum for other users.

“GSMA Public Policy Position on Licensed Shared Access and Authorized Shared Access,” February 2013, p. 4 (hereafter “GMSA on LSA”). Mile One infers from the latter that significant



gains from technical efficiency, economic efficiency and social benefits can potentially flow from a regulatory framework for the CBRS band that mandates an interface between the established SAS protocols and a carefully crafted domain in the priority access tier for licensed shared access by non-exclusive nationwide licensee operations and similarly situated new entrants.

In concept, the addition of a synchronized shared access platform as a hybrid form of “LSA in SAS” requires only a marginal increase in the complexity of existing SAS system practices in the U.S. and LSA system practices in Europe.<sup>12</sup> Theoretically, both operating systems run on software-defined radio technologies that enable the respective controllers to adapt to rapidly to the change in regulatory and market processes to accommodate synchronized shared access. Judging from market trial reports in the U.S. and in Europe, a prototype for the systems architecture of a synchronized shared access platform would obviously include (1) a proxy domain defined by the authorized universe of non-exclusive licensees for the priority access tier; (2) a repository for the proxy domain consisting of relevant licensee metadata; and (3) a controller for the proxy domain to manage data flows from the repository for the proxy domain to SAS controllers in the relevant licensing areas. The proxy domain controller can employ an algorithm to coordinate traffic destined for the priority access tier according to metadata relating to variables such as time, geography and bandwidth, to assure that peak traffic levels are manageable. Synchronization and coordination on this basis are feasible due to asymmetrical upload and download traffic patterns that ordinarily enable users to adopt contention-based protocols and congestion mitigation procedures to meet a common need for the sharing of protection against interference in the priority access tier.

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<sup>12</sup> Aho et al, “Field Trial of Citizens Broadband Radio Service (CBRS) / Spectrum Access System (SAS),” Researchgate Conference Paper (2016) (Finnish market trial on CBRS protocol).

Ultimately, the seeding of the CBRS band with a pool of non-exclusive licensees in the priority tier serves the public interest by enabling the Commission to allocate protection against interference within the framework of the existing three tier spectrum sharing regime, but on terms that more justly compensate 3650 MHz licensees for the taking of their renewal expectancies, and which also incentivize implementation of digital divide use case scenarios. In other words, to the extent that the deployment plan for CBRS retains its focus on census tract level densification, the likely effect of allowing synchronized shared access would be to drive investment to areas experiencing artificial scarcities of “last mile” wireless solutions, to drive investment to vertically integrated digital divide use case scenarios and similar innovations, and ultimately, to encourage pareto efficient synchronization and coordination of traffic flows from the proxy domain to mitigate congestion and avoid interference. Clearly, the public interest is well served an approach that refrains from wasting the opportunity to leverage value from the existing pool of nationwide 3.65 MHz licensees and other similarly situated entities.

**B. A “Synchronized Shared Access” Protocol Supports A Broader Mix Of Spectrum Rights With Which To Incentivize Investment And Innovation.**

The second prong of Section 303(y) prohibits an approach to flexibility that deters investment. The findings of the FCC’s Spectrum Task Force provide reasonable assurance that provisions for synchronized shared access in the priority access tier are more likely to multiply investment than to deter it: “The zoning approach leads to fewer constraints ... which provides greater technical flexibility for the services to develop, grow and evolve.”<sup>13</sup> The technical flexibility to develop, grow and evolve services in this case arises from the pareto efficient allocation of protection against interference to an existing pool of non-exclusive nationwide licensees. Consistent with task force findings, Mile One notes that the use of a zoning model to

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<sup>13</sup> SPECTRUM POLICY TASK FORCE, FCC, REPORT OF THE INTERFERENCE PROTECTION WORKING GROUP 2, p. 23. (2002).

effectuate synchronized shared access is complimentary with opportunities for exclusive licensing in the priority access tier, and retains its pareto efficient character whether the final regulatory scheme employs a quota system for exclusive licenses or not.

Subject to a reasonably tailored definition for defining the bundle of liberty and property interests, rights and responsibilities that one secures by acquiring an FCC license, according flexibility through provisions for synchronized shared access has the potential to reduce the complexity of an auction-centric method of allocation. In this regard, it certainly accords with safe and sound investment practices to recognize FCC licenses as a contractual covenant between the licensee and the United States that confers a usufructory property right, in the nature of a chose of action, in proceeds from the beneficial use of specified radio frequencies. In an apparent effort to avoid confusion, Congress added Section 197 to the Internal Revenue Code, a provision which classifies FCC licenses as a form of intangible asset, by enacting § 13261(a) of the Omnibus Reconciliation Act of 1993 in connection with its delegation of competitive bidding authority. See, Pub. L. No. 103-66, 107 Stat. 312, 532, 1993-3 C.B. 1, 120 (the “1993Act”). Supreme Court jurisprudence currently defines an intangible asset in the nature of a chose in action as “an interest in property not immediately reducible to possession,” and notes further that the existence of this personal property interest was part of the original understanding at the time of ratification. *Sprint Commc’ns Co. v. APCC Servs., Inc.*, 554 U.S. 269, 275-85 (2008) (citing *Welch v. Mandeville*, 1 Wheat. 233, 236 (“Courts of law, following in this respect the rules of equity, now take notice of assignments of choses in action, and exert themselves to afford them every support and protection.”)) Clarifying these rights in the instant rule making proceeding incentivizes investment and innovation in spectrum sharing regime by enabling depository

institutions to better evaluate issues related to risk and reward that bear on safe and sound banking practices.

**C. The Collection Of An Administrative Incentive Fee Is Both Consistent With International Treaties And With U.S. Protocols For Treaty Implementation.**

The third prong of Section 303(y) requires consistency with U.S. treaty obligations. On this point, Mile One is mindful that the 3300 – 4200 spectrum band is the subject of various international treaties and is the largest contiguous frequency range potentially available for use to implement mobile broadband with the 5G New Radio air interface below 6 GHz. The view expressed by expert industry commentary is that the collection of an administrative incentive as a condition for non-exclusive licensing is an appropriate means to further social and cultural objectives, and that inclusion of non-mobile incumbents in the International mobile telecommunications (IMT) band on that basis “could potentially provide other applications or radio services, in accordance with Chapter 5 of the Radio Regulations (ITU-R).” GSA on LSA, p. 4. Mile One therefore concludes that the use of a licensed shared access model to assign rights of use in the priority access tier in no way derogates the prevailing treaty law or International Telecommunications Union Radiocommunications sector standards for deployment of IMT technologies.

If anything, the collection of an administrative incentive fee for synchronized shared access is a market like method of spectrum allocation that tends to fulfill treaty obligations relating to information services covered by Article 7 of the International Convention For The Elimination of All Forms Of Racial Discrimination.<sup>14</sup> Article 7 provides in pertinent part that

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<sup>14</sup> The International Convention on the Elimination of All Forms of Racial Discrimination. State Dept., Treaties in Force 422-423 (June 1996), Annex to G. A. Res. 2106, 20 U. N. GAOR Res. Supp. (No. 14) 47, U. N. Doc. A/6014, Art. 2(2) (1965); and see, U.S. reservations, declarations, and understandings, International Convention on the Elimination of All Forms of Racial Discrimination, 140 Cong. Rec. S7634-02 (daily ed., June 24, 1994) (reservation holding “[t]hat the Constitution and laws of

“States Parties undertake to adopt immediate and effective measures, particularly in the fields of teaching, education, culture and information, with a view ... to promoting understanding, tolerance and friendship among nations.” For reasons underscored in guidance provided by a recent Congressional Research Service report, the inclusion of a synchronized shared access platform in the priority access tier has positive implications for U.S. global competitiveness in a future 5G marketplace and represents an integral part of the paradigm shift toward dynamic spectrum sharing for the benefit of distressed LMI communities.

**IV. THE COMMISSION SHOULD MODIFY THE BASELINE SCENARIO TO DETER UNDER-UTILIZATION OF SPECTRUM RESOURCES FOR DIGITAL DIVIDE USE CASES, AND TO LEVERAGE CRA-BASED LENDING, INVESTMENT, AND SERVICE PROGRAMS FOR WIRELESS BROADBAND DEPLOYMENT IN URBAN AND RURAL AREAS.**

Subject to the findings required by Section 309(y), Mile One urges the Commission to use its discretion to responsibly incentivize investment and innovation in the following ways: (1) authorize the collection of an administrative incentive fee in exchange for non-exclusive licensing in a zone of the PALs sub-band; (2) authorize secondary market transactions on reasonable terms by 3650 MHz and PALs license holders alike; and (3) specify terms upon which a consortium covered by 47 CFR 1.2110(b) (4) of the Commission’s rules can associate with regulated depository institutions, to offer specialized lending, investment and service programs to support broadband deployment for the benefit of LMI communities, without prejudice under rules governing attributable material interests; and (4) use the declaratory ruling process to reconsider, on a cases by case basis, waivers of the Commission’s voluntary

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the United States contain extensive protections of individual freedom of speech, expression and association. Accordingly, the United States does not accept any obligation under this Convention, in particular under Articles 4 and 7, to restrict those rights, through the adoption of legislation or any other measures, to the extent that they are protected by the Constitution and laws of the United States.”); see also, *Grutter v. Bollinger*, 539 U.S. 306 (2003) (Ginsburg, J. concurring) (ICERD Treaty endorses “special and concrete measures ... for the purpose of guaranteeing ... full and equal enjoyment of human rights and fundamental freedoms.”)

abstention from certifying eligibility for non-recognition of capital gains for sales and exchanges that implement the 1993 and 1996 Acts.

**A. Collect Administrative Incentive Fees To Provide A Basis For Spectrum Sharing With Protection Against Interference In The Priority Access Tier.**

The use of an administrative incentive fee is a “light touch” regulatory approach to broadband investment for the benefit of LMI communities, and fits neatly into the policy framework that the Commission originally enunciated in 2015 to implement the CBRS band. For example, the 2015 Report and Order states that “we strive to minimize the adverse effects of rule changes on incumbents to the extent possible without compromising the public interest benefits that we believe such rules changes will produce.” *Id.* at para. 394. According to the latter, the public interest is well served by an approach that gives effect to those principles by retaining discretion to balance reliance the large economies of scale of the dominant nationwide providers, with regulatory flexibility accommodations for smaller economies of scope in terms of use cases that target the broadband investment needs of LMI communities.<sup>15</sup> As explained before, the implementation of the priority access tier in this way more justly compensates 3650 MHz incumbents that proceeded in reliance upon renewal expectancies granted prior to 2013. A reasonable administrative incentive fee price might take into account the fair market value of

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<sup>15</sup> Assuming that the applicable standard of review calls for strict scrutiny as to whether the terms of the PALs NPRM as proposed are narrowly tailored to further a compelling governmental interest, it is manifestly unclear from the record that a compelling governmental interest has been articulated that would plausibly justify the imposition of discriminatory cost burdens on LMI communities, if market forces are already adequate to elicit substantial investment by the nationwide service providers. ON one hand, the economic cost benefit evidence weighs decisively in favor the conclusion that less restrictive alternatives than a size-based quota system are available. On the other hand, the legal analysis suggests that the treatment of the less restrictive alternative is at best subject to review as a form of time, place and manner regulation, and at worst, as an uncompensated taking that is subject to strict scrutiny review insofar as it grants and restricts access to the public forum on the basis of size standards. As there is no evidence in the record to support that conclusion that the proposed quota system for the dominant wireless providers is narrowly tailored to further any governmental interest that the federal judiciary construes as compelling, the Commission has both the discretion and the duty to consider less restrictive alternatives for the attainment of pareto efficient outcomes for spectrum allocation.

retaining the non-exclusive nationwide license, an offset for the value of a 40% credit for waiver of designated entity bidding credits, and incentive credits for consumer surplus innovations and contributions to U.S. global competitiveness in the 5G marketplace. In conjunction with the proposed collection of administrative incentive fees, Mile One agrees that a renewable license term for priority access tier licensees could improve deployments in urban and rural areas.

**B. Allow Partitioning and Disaggregation For Secondary Market Transactions To Include Sales And Exchanges Of Non-Exclusive Priority Access Rights.**

Mile One also joins those commenters who advocate the allowance of partitioning and disaggregation of PALs licenses to support a secondary market for spectrum use rights, but advocates the extension of such procedures to non-exclusive nationwide licensees that opt for synchronized shared access. This aspect of the proposed rules invites reference to the policies observed in *Channel 16 of Rhode Island v. F.C.C.*, 440 F.2d 266 (D.C. Cir. 1971) where the court confirmed that waiver relief under the Commission's rules for petitioners that demonstrate that: (i) the underlying purpose of the rule(s) would not be served or would be frustrated by application to the present case, and that a grant of the waiver would be in the public interest; or (ii) in view of unique or unusual factual circumstances of the instant case, application of the rule(s) would be inequitable, unduly burdensome, or contrary to the public interest, or the applicant has no reasonable alternative. See, 47 C.F.R. § 1.925(b)(3). In *Channel 16*, the D.C. Circuit applied the latter waiver criteria to reverse the Commission's decision to deny waiver relief after concluding that lack of competition was a significant factor warranting the relief that Channel 16 had requested on the ground that "rigidity unaccompanied by meaningful consideration of the particular or partial problems ... cannot be sustained ...." Id. "Not only is there no one waiting for this permit who would implement UHF service to the Providence market more quickly than Channel 16," the Court said, "there is an additional UHF station

assigned to Providence which is vacant, and for which no one has ever applied in the 15 years the channel has been available.” Id.

In concept, a partitioning and disaggregation rebate program is an economically sound platform which mitigates the bidder’s curse while at the same time enabling the Commission to give effect to Section 309(j)’s statutory requirement for “economic opportunity for a wide variety of applications” in a robust way. An efficient secondary market can lead to lower cost deployments with advanced internet protocol technologies, open source code software, mesh network architectures, and software-defined radio devices, and thereby promote investment by Federal Reserve member banks in ways that the dominant entities have historically declined to undertake on a significant scale. See, Ukhaneva, Universal Service in a Wireless World, Georgetown University, November 17, 2015 (Figure 4, “Lifeline Payments in Millions 2003-2014) (describing increases in subscribership rates from Lifeline program participation by reseller service providers) (available online). In particular, the allowance of partitioning and disaggregation can facilitate investment in facility-based deployments that are beneficial for both the original PALs owner and the secondary market transferee on terms comparable to the FCC’s former Pioneer’s Preference Program.

**C. Expand Provisions For Innovative Spectrum Sharing Methods Under The “Consortium Exception” To The Attributable Material Relationship Rules In 47 CFR 1.2110(b) (4).**

The Regulatory Flexibility Act has broad provisions for regulatory flexibility to accommodate this interest. 5 U.S.C. § 603(c)(1)-(4). Most notably, the standard alternatives include: “(1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance and reporting requirements under the rule for small entities; (3)



the use of performance rather than design standards; and (4) an exemption from coverage of the rule, or any part thereof for small entities.” Id. Mile One’s advocacy for regulatory flexibility is grounded in part its interest in working with regulates of the Federal Reserve as a consortium within the meaning of the Commission’s competitive bidding rules in 47 CFR 1.2110(b) (4). and as an intermediary agent for specialized broadband lending, investment and services in association with interested depository institutions.

There is a strong case to be made here for the exercise of regulatory flexibility to effectuate the part of the Community Reinvestment Act that seeks to mitigate disparities in broadband deployment affecting distressed LMI communities. Thus can be done in four ways that directly optimize the baseline scenario: (1) “performance standards” for PALs licensing in areas with large percentages and numbers in LMI communities and Lifeline households in distress in lieu of rigid adherence to “design standards” that serve mainly to maximize auction revenue; (2) notice of transactional principles that are consistent both with safe and sound banking practices and with generally accepted transactional methods for property rights; and (3) procedural relief on a case by case basis to accommodate license renewal and priority access expectancies of non-bidder wireless innovator entities on a case by case basis.

Ultimately, the Federal Reserve’s new underwriting standards for investment in broadband deployment especially cries for FCC policy development in coordination the factors that the examining agencies consider both in their review of banking practices in general, and particularly in the award of ratings in the “Outstanding,” “Satisfactory,” “Needs To Improve,” and “Substantial Noncompliance” categories, as well as how flexible administration of the FCC’s “consortium exception” and the attributable material relationship rules can incentivize specialized broadband business development programs. Ultimately, depository institutions have

broad discretion to implement specialized programs for wireless broadband lending, investment and services for the digital divide use case, and such programs are more likely to materialize for the CBRS with moderate revisions to the proposed baseline scenario to accommodate that outcome. The Commission should craft its final rule in this proceeding to leave the door open to innovation under the consortium exception and the CRA.

**D. Reconsider The Legal Assumptions Of The Continuing Abstention From Issuance Of Wireless Tax Certificates Using The Declaratory Ruling Process On A Case By Case Basis.**

Lastly, the case for relaxation of the Commission's standing abstention from implementation of its PCS tax certificate policy has direct support in the "cardinal principle of statutory construction that repeals by implication are not favored." *Randall v. Loftsgaarden*, 478 U.S. 647, 661 (1986) (citations omitted); see also *Inter-Coastal Xpress, Inc. v. United States*, 296 F.3d 1357, 1370 (Fed. Cir. 2002); *State of California v. United States*, 271 F.3d 1377, 1382 (Fed. Cir. 2001). Furthermore, "where two statutes are capable of co-existence, it is the duty of the courts, absent a clearly expressed congressional intention to the contrary, to regard each as effective." *Ruckelshaus v. Monsanto Co.*, 467 U.S. 986, 1018 (1984) (citations omitted). Repeals by implication are countenanced only when the two statutes are irreconcilable. See *Hanlin v. United States*, 214 F.3d 1319, 1321 (Fed. Cir.), reh'g denied (2000) (citing *Morton v. Mancari*, 417 U.S. 535, 550 (1974)). Under this stringent test, it can be argued that the legislation that Congress enacted in 1995 to repeal 26 U.S.C. 1071 did not impliedly repeal the tax certificate mandate contained in the 1993 Budget Reconciliation Act, and further, that the Telecommunications Act of 1996, if anything, expanded the Commission's remedial jurisdiction by reconstituting the Communications Act as one of the equal rights law of the United States through the inclusion of anti-discrimination protections in the text of 47 U.S.C. 151.

Other judicial support for the proposition that the Commission retains discretion to administer a tax certificate for sales and exchanges of wireless interests appears in intervening Supreme Court jurisprudence. In *Fisher v. University of Texas*, 579 U.S. \_\_\_\_ (2016), for example, the Supreme Court recognized the existence of a compelling governmental interest in diversity in the setting of a college admissions program. Mile One construes the *Fisher* decision to mean that the negative implications of the Adarand doctrine which witnesses relied upon in testifying in favor of the repeal of 26 U.S.C. 1071 was sub silencio overruled by the intervening recognition of a legal basis upon which diversity programs can now withstand strict scrutiny. See e.g., Bush, Antoinette Cook and Martin, Marc S. (1996) "The FCC's Minority Ownership Policies from Broadcasting to PCS," Federal Communications Law Journal: Vol. 48, Iss. 3, Article 3 (discussing delay from the dismantlement of measures to promote diversity of ownership). Further, the "information service" classification that the Commission recently assigned to internet service providers as a class simply serves to confirm that the wireless industry qualifies in an appropriate case for a revised extension of the diversity rationale that the Commission has previously observed. In fact, James Madison arguably anticipated the reasoning of the *Fisher* decision when he stated in 18<sup>th</sup> century paradigm that the "diversity in the faculties ... from which the rights of property originate, is ... *the first object of government*." Federalist No. 10 ("The Utility of the Union as a Safeguard Against Domestic Faction and Insurrection") Daily Advertiser, Thursday, November 22, 1787 (emphasis added).<sup>16</sup>

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<sup>16</sup> Without question, the understanding of the role of diversity has advanced markedly since the Adarand decision in 1994. See also, Scott E. Page, "The Difference: How The Power of Diversity Creates Better Groups, Firms, Schools, and Societies," Princeton, NJ: Princeton University Press, 2007; and Robert D. Putnam, "E Pluribus Unum: Diversity and Community in the Twenty-first Century, The 2006 Johan Skytte Prize Lecture, Scandinavian Political Studies, Vol. 30 – No. 2, 2007 (characterizing the role of social networks as a valuable source of social capital when considered in the context of increasing ethnic and social heterogeneity in virtually all advanced countries).

The anti-discrimination rationale and statutory construction employed by the Supreme Court in *F.C.C. v Nextwave Personal Communications*, 537 U.S. 293 (2003), also firmly supports the proposition that reliance on case by case review under the auspices of the declaratory ruling process is suitable to satisfy the “narrowly tailored” requirement imposed by the prevailing strict scrutiny standards of review. In *Nextwave*, the Supreme Court declined to excuse a duty of non-discrimination imposed by certain provision of the Bankruptcy Code. It arriving at the conclusion that the Commission was bound by the duty on non-discrimination, the Court applied canons of statutory construction which called for reference to the Communications Act as a part of a statutory scheme that included, but was not limited, to the Communications Act. The same reasoning that compelled the Supreme Court to enforce anti-discrimination principles under the Bankruptcy Code logically extends to the observance of the anti-discrimination duties that are jointly imposed by the statutory scheme consisting of 42 U.S.C. 1981 and 47 U.S.C. 151.

Ultimately, there is little evidence that legislation Congress used to repeal 26 U.S.C. 1071 in 1995 is irreconcilable with the proposed retention of wireless tax certificate authority. The former implicates policy statements on minority ownership of broadcasting and cable facilities which the Commission adopted in 1978 and 1982 respectively, not the wireless tax certificate policy that the Congress expressly authorized in 1993. See, “FCC's Tax Certificate Program: Hearing Before the Senate Comm. on Finance,” 104th Cong. 23 (1995). According to the remedial reasoning of Supreme Court decisions in *Fisher* and *Nextwave*, moreover, the remedial interest of the various Federal Reserve districts in using the CRA to enable digital divide use

case scenarios represents a compelling rationale for case by case review of wireless tax certificate requests pursuant to the Commission's declaratory ruling process.<sup>17</sup>

## CONCLUSION

. Mile One appreciates this opportunity to submit reply comments urging the Commission to modify the baseline scenario for the PALs NPRM.

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Respectfully Submitted,

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<sup>17</sup> See, Ofori, Kofi Asiedu and Lloyd, Mark, "The Value of the Tax Certificate," Federal Communications Law Journal: Vol. 51: Iss. 3, Article 10 (1999); and Erwin Krasnow & Lisa Fowkles, "The FCC's Minority Tax Certificate Program: A Proposal for Life After Death," 51 Fed. Comm. L.J. 665, 670 (1999) (tax certificate policy enabled acquisition of 288 radio stations, 43 television stations, and 31 cable systems over a fifteen year period).

## **APPENDICES OF TABLES, CHARTS AND FIGURES<sup>18</sup>**

- A. Table: “U.S. Cities with 100,000+ Households Ranked by 'Worst Connection': Median Household Incomes vs. Percent of Households With No Internet Access”
- B. Table: “Service Revenues for Mobile Wireless Service Providers (\$ millions), 2007–2015”
- C. Table: “Market Shares for Mobile Wireless Service Providers Based on Service Revenues, 2012–2015”
- D. Chart: “Capital Expenditures by U.S. Mobile Providers, 1Q12 -4Q15”
- E. Chart: “U.S. Mobile Wireless Connections: 2003–2015”

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<sup>18</sup> For ease of cross-reference, the listed tables and charts appear in the appendix in the same form as they as were originally presented in the Federal Reserve report and in the Commission’s Nineteenth Broadband Report.

## APPENDIX A

**TABLE 1** U.S. Cities with 100,000+ Households Ranked by 'Worst Connection': Median Household Incomes vs. Percent of Households With No Internet Access

|    | City                        | Median household income | Percent of households with no internet access |    | City               | Median household income | Percent of households with no internet access |    | City              | Median household income | Percent of households with no internet access |
|----|-----------------------------|-------------------------|---|----|--------------------|-------------------------|---|----|-------------------|-------------------------|---|
| 1  | Detroit                     | \$24,820                | 39.9  | 25 | Omaha              | \$47,512                | 22.9  | 49 | Boston            | \$53,583                | 19.9  |
| 2  | Miami                       | \$31,070                | 36.8  | 26 | Albuquerque        | \$48,357                | 22.9  | 50 | Denver            | \$51,089                | 19.2  |
| 3  | Cleveland                   | \$26,096                | 36.1  | 27 | Pittsburgh         | \$42,004                | 22.7  | 51 | Arlington         | \$51,400                | 18.9  |
| 4  | New Orleans                 | \$36,631                | 33.8  | 28 | Tampa              | \$42,649                | 22.4  | 52 | St. Paul          | \$49,469                | 18.6  |
| 5  | Buffalo                     | \$32,392                | 32.6  | 29 | Fort Wayne         | \$39,878                | 22.2  | 53 | Long Beach        | \$52,116                | 18.6  |
| 6  | Memphis                     | \$36,722                | 32.3  | 30 | St. Petersburg     | \$43,894                | 22.2  | 54 | Orlando           | \$41,345                | 18.1  |
| 7  | St. Louis                   | \$34,488                | 31.9  | 31 | Corpus Christi     | \$49,686                | 22.1  | 55 | Charlotte         | \$51,034                | 18.0  |
| 8  | Milwaukee                   | \$35,186                | 31.2  | 32 | Tucson             | \$35,720                | 22.0  | 56 | Minneapolis       | \$50,563                | 18.0  |
| 9  | Baltimore                   | \$42,266                | 30.4  | 33 | New York           | \$52,223                | 21.9  | 57 | Lexington-Fayette | \$47,535                | 17.6  |
| 10 | Cincinnati                  | \$34,605                | 30.3  | 34 | Mesa               | \$47,561                | 21.8  | 58 | Lincoln           | \$49,419                | 16.7  |
| 11 | Toledo                      | \$31,907                | 29.8  | 35 | Greensboro         | \$41,150                | 21.8  | 59 | Aurora            | \$49,142                | 15.6  |
| 12 | Philadelphia                | \$36,836                | 29.8  | 36 | Fort Worth         | \$52,430                | 21.8  | 60 | San Francisco     | \$77,485                | 14.9  |
| 13 | El Paso                     | \$41,129                | 28.7  | 37 | Los Angeles        | \$48,466                | 21.7  | 61 | Austin            | \$56,351                | 14.9  |
| 14 | Dallas                      | \$41,978                | 28.5  | 38 | Nashville-Davidson | \$46,803                | 21.5  | 62 | Portland          | \$55,571                | 14.8  |
| 15 | Fresno                      | \$40,179                | 27.0  | 39 | Oklahoma City      | \$46,232                | 21.4  | 63 | Raleigh           | \$55,170                | 14.4  |
| 16 | Wichita                     | \$43,538                | 26.6  | 40 | Jacksonville       | \$47,424                | 21.1  | 64 | Henderson         | \$60,819                | 13.5  |
| 17 | Tulsa                       | \$41,495                | 26.2  | 41 | Sacramento         | \$48,034                | 21.1  | 65 | Colorado Springs  | \$53,550                | 13.2  |
| 18 | Indianapolis                | \$41,361                | 26.0  | 42 | Las Vegas          | \$49,289                | 20.9  | 66 | Madison           | \$49,546                | 12.9  |
| 19 | San Antonio                 | \$45,399                | 25.3  | 43 | Atlanta            | \$46,485                | 20.8  | 67 | Anchorage         | \$79,045                | 12.8  |
| 20 | Chicago                     | \$47,099                | 24.9  | 44 | Urban Honolulu CDP | \$61,559                | 20.8  | 68 | Seattle           | \$70,172                | 12.2  |
| 21 | Houston                     | \$45,353                | 24.9  | 45 | Bakersfield        | \$54,763                | 20.8  | 69 | San Diego         | \$63,456                | 12.0  |
| 22 | Kansas City                 | \$45,551                | 24.4  | 46 | Oakland            | \$54,394                | 20.2  | 70 | San Jose          | \$80,977                | 11.6  |
| 23 | Phoenix                     | \$46,601                | 24.1  | 47 | Columbus           | \$44,426                | 20.0  | 71 | Virginia Beach    | \$62,855                | 10.5  |
| 24 | Louisville/Jefferson County | \$44,893                | 24.0  | 48 | Washington, D.C.   | \$67,572                | 20.0  | 72 | Plano             | \$80,448                | 7.7   |

SOURCE: Census Bureau, 2013 American Consumer Survey.

## APPENDICES B and C

**Table II.C.1**  
**Service Revenues for Mobile Wireless Service Providers (\$ millions), 2007–2015**

| <b>National</b>         | <b>2007</b> | <b>2008</b> | <b>2009</b> | <b>2010</b> | <b>2011</b> | <b>2012</b> | <b>2013</b> | <b>2014</b> | <b>2015</b> |
|-------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <i>Verizon Wireless</i> | 38,016      | 49,717      | 52,046      | 55,629      | 59,157      | 63,733      | 69,033      | 72,630      | 70,396      |
| <i>AT&amp;T</i>         | 38,678      | 44,249      | 48,563      | 53,510      | 56,726      | 59,186      | 61,552      | 61,032      | 59,837      |
| <i>Sprint</i>           | 32,106      | 28,435      | 25,832      | 25,894      | 27,390      | 29,086      | 29,263      | 27,959      | 25,845      |
| <i>T-Mobile</i>         | 16,891      | 19,242      | 18,926      | 18,689      | 18,481      | 17,213      | 20,535      | 22,375      | 24,821      |
| <b>Regional</b>         | <b>2007</b> | <b>2008</b> | <b>2009</b> | <b>2010</b> | <b>2011</b> | <b>2012</b> | <b>2013</b> | <b>2014</b> | <b>2015</b> |
| <i>U.S. Cellular</i>    | 3,679       | 3,940       | 3,926       | 3,913       | 4,054       | 4,099       | 3,595       | 3,398       | 3,350       |
| <i>NTELOS</i>           | 357         | 392         | 400         | 383         | 395         | 424         | 467         | 445         | 367         |
| <i>Cincinnati Bell</i>  | 267         | 291         | 284         | 269         | 252         | 225         | 185         | 126         |             |
| <i>Leap Wireless</i>    | 1,396       | 1,709       | 2,171       | 2,413       | 2,829       | 2,947       | 2,631       |             |             |
| <i>Metro PCS</i>        | 1,919       | 2,437       | 3,130       | 3,690       | 4,428       | 4,540       |             |             |             |
| <i>Centennial</i>       | 484         | 524         | 408         |             |             |             |             |             |             |
| <i>CentennialPCS</i>    | 294         | 320         | 236         |             |             |             |             |             |             |
| <i>Rural Cellular</i>   | 608         | 327         |             |             |             |             |             |             |             |
| <i>Alltel</i>           | 7,984       |             |             |             |             |             |             |             |             |
| <i>Dobson</i>           | 1,030       |             |             |             |             |             |             |             |             |
| <i>SunCom</i>           | 649         |             |             |             |             |             |             |             |             |

Source: UBS Investment Research. UBS US Wireless 411, Version 51, Table 31. UBS US Wireless 411, Version 59, Figure 63.

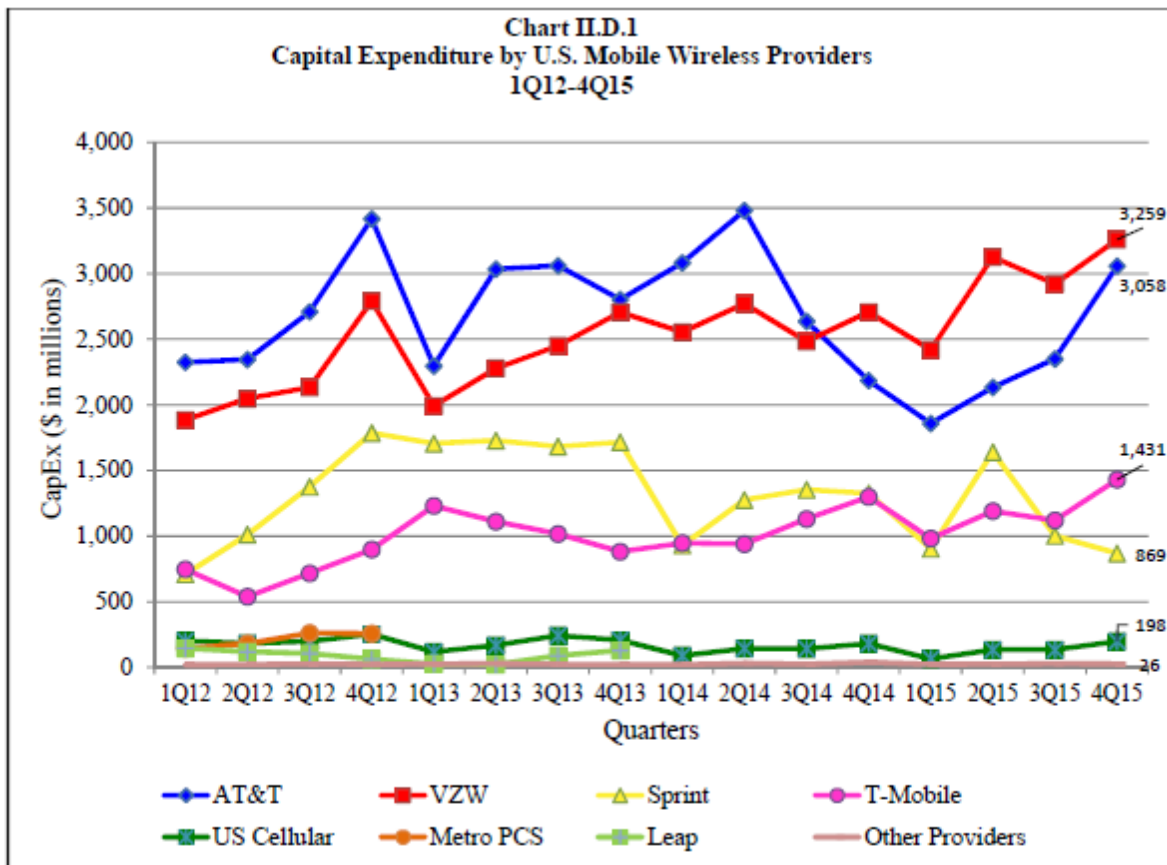
**Table II.C.2**  
**Market Shares for Mobile Wireless Service Providers Based on Service Revenues, 2012–2015**

| <b>Nationwide Service Providers</b>                   | <b>2012</b>  | <b>2013</b>  | <b>2014</b>  | <b>2015</b>  |
|---|--------------|--------------|--------------|--------------|
| <b>Verizon Wireless</b>                               | 34.4%        | 36.5%        | 38.7%        | 38.1%        |
| <b>AT&amp;T</b>                                       | 32.0%        | 32.5%        | 32.5%        | 32.4%        |
| <b>Sprint</b>   | 15.7%        | 15.5%        | 14.9%        | 14.0%        |
| <b>T-Mobile</b>                                       | 9.3%         | 10.9%        | 11.9%        | 13.5%        |
| <b>Total Nationwide Service Provider Market Share</b> | <b>91.5%</b> | <b>95.3%</b> | <b>97.9%</b> | <b>98.0%</b> |
| <b>Regional Service Providers</b>                     | <b>2012</b>  | <b>2013</b>  | <b>2014</b>  | <b>2015</b>  |
| <b>U.S. Cellular</b>                                  | 2.2%         | 1.9%         | 1.8%         | 1.8%         |
| <b>Metro PCS</b>                                      | 2.5%         |              |              |              |
| <b>Leap Wireless</b>                                  | 1.6%         | 1.4%         |              |              |
| <b>NTELOS</b>   | 0.2%         | 0.2%         | 0.2%         | 0.2%         |
| <b>Cincinnati Bell</b>                                | 0.1%         | 0.1%         | 0.1%         |              |
| <b>Other</b>  | 1.9%         | 1.0%         |              |              |
| <b>Total Regional Service Provider Market Share</b>   | <b>8.5%</b>  | <b>4.7%</b>  | <b>2.1%</b>  | <b>2.0%</b>  |

Source: UBS US Wireless 411, Version 51 2014 Q1, Table 31, 19; UBS US Wireless 411, Version 57, Figure 51, UBS US Wireless 411, Version 59, Figure 63; see also *Seventeenth Report*, Table II.C.2 for pre-2014 data.



## APPENDIX D



Source: UBS US Wireless 411, Version 55, Figure 54; UBS US Wireless 411, Version 57, Figure 60; UBS US Wireless 411, Version 59, Figure 72. T-Mobile and MetroPCS merged in 2013; AT&T acquired Leap in 2014.

## APPENDIX E

Chart II.C.1  
U.S. Mobile Wireless Connections: 2003–2015



Source: 9<sup>th</sup> Report, Appendix A-8, Table 4; 11<sup>th</sup> Report, p. 93, Appendix Table 4; 12<sup>th</sup> Report, p. 132, Appendix Table 4; 14<sup>th</sup> Report, p. 223, Appendix Table C-4; 15<sup>th</sup> Report, p. 34, Table 3; 16<sup>th</sup> Report, p. 55, Table 13; 17<sup>th</sup> Report, p. 10, Table II.B.1; UBS US Wireless 411, Version 59, Figure 53.