

**Before the
NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION
WASHINGTON, DC 20230**

In the Matter of)	
)	
Development of a National Spectrum)	Docket No. 230308-0068
Strategy)	Document ID NTIA-2023-0003

SUPPLEMENTAL COMMENTS OF LOCKHEED MARTIN CORPORATION

I. Introduction

Lockheed Martin Corporation (“Lockheed Martin”) appreciates the opportunity to submit these supplemental comments in response to the National Telecommunications and Information Administration’s (“NTIA”) Request for Comment (“*Request for Comment*”), *Development of a National Spectrum Strategy*.¹ In addition to these supplemental comments, Lockheed Martin also submitted initial comments to the *Request for Comment*,² met with NTIA to discuss its comments, and participated in both National Spectrum Strategy (“NSS”) listening sessions. The United States (“U.S.”) has long demonstrated leadership in spectrum governance and Lockheed Martin believes that the NSS provides a unique opportunity to bring U.S. spectrum governance and policies into the 21st Century.

Below, Lockheed Martin wishes to emphasize and expand upon certain aspects of its initial comments to the *Request for Comment*, specifically: spectrum harmonization, standardization, and the spectrum pipeline; amending the Spectrum Relocation Fund (“SRF”); and ensuring the continued operation of aerospace & defense (“A&D”) contractor facilities. Lockheed Martin believes these aspects to be critical to the development of a truly comprehensive strategy designed to advance U.S. technological leadership across critical U.S. economic sectors, such as A&D.

II. Supplemental Comments for Consideration

a) Standardization, Harmonization, and the Spectrum Pipeline

Lockheed Martin emphasizes that global spectrum harmonization is essential to national security systems, aeronautical platforms, and other capabilities and systems that operate both within and outside the U.S., with extensive benefits to its citizens. Notably, for many of these capabilities and systems, the U.S. is already the most influential nation and global leader with respect to standards setting—this is evidenced by the average \$45.8 billion in foreign military sales (“FMS”) conducted by the U.S. annually between FY2019-FY2022.³ In the broader global

¹ *Development of a National Spectrum Strategy Request for Comment*, Docket No. 230308-0068 (rel. Mar. 16, 2023), <https://rb.gy/62ta6>.

² Comments of Lockheed Martin (Docket No. 230308-0068).

³ Department of State, Fiscal Year 2022 U.S. Arms Transfers and Defense Trade: Fact Sheet (accessed May 19, 2023), <https://rb.gy/3kv5v>.

security context, globally harmonized spectrum ensures the interoperability of national security systems between the U.S. and its allies—this becomes especially critical during joint-force operations, a White House⁴ and Department of Defense (“DoD”) priority. For these reasons, Lockheed Martin recommends that globally harmonized spectrum standards for national security systems be actively protected against de-harmonization, to include as a result of spectrum pipeline decisions.

Relatedly, Lockheed Martin supports greater U.S. participation in international standards setting bodies for 5G, 6G, and beyond, from both government and a wide array of industry stakeholders. However, Lockheed Martin notes that, while many commercial wireless entities have, and continue to, express concern over the foreign dominance within these standards bodies, many of these same entities are actively advocating for the U.S.’ spectrum pipeline to conform to the wireless standards already developed by *the same bodies about which they express concern of foreign dominance*. For example, one such standardized band is the S-band, which is home to technologically advanced and mature, national security critical capabilities for which there is no international (or propagation) equal. It is unreconcilable to simultaneously express concern over foreign influence in standards bodies, presumably because not in U.S. wireless industry interests, and advocate for the adoption of those same-foreign-dominated standards that will disrupt a highly developed national security economy—both national security applications and the national security industry. It is worth noting that the U.S. Government has publicly warned that our adversaries “seek to restrict [DoD’s] spectrum access through international forums.”⁵

Further, how the spectrum pipeline is operationalized will be a key determining factor in not only whether the U.S. remains the global leader in national security technology, but also whether federal agencies can execute many of their statutorily mandated national security missions. Lockheed Martin agrees with NTIA’s definition of “spectrum pipeline”, which means a process that identifies spectrum bands *regardless of current allocation status (i.e., both federal and non-federal)* that should be studied for repurposing to meet future requirements of *federal and non-federal users alike*.⁶ This is a significant shift from the current popular conceptualization of the spectrum pipeline, where the pipeline (almost exclusively) seeks to reallocate federal spectrum via auction, disproportionately benefitting a small subset of entities in the wireless ecosystem. Lockheed Martin has previously characterized this narrower approach to the pipeline as reflecting a misguided and inaccurate assumption that federal users have “too much” spectrum while exclusive-licensed wireless companies have “not enough.”⁷ Thus, we applaud NTIA’s definition of a spectrum pipeline—one that reflects the realities of an increasingly congested spectrum environment served by a larger mix of wireless service offerings and a need for co-existence solutions, as opposed merely to relocation. Lockheed Martin recommends that beyond just amplifying its definition of a spectrum pipeline, NTIA should actively promote spectrum co-

⁴ See, White House, *National Security Strategy* (Oct. 12, 2022), <https://rb.gy/kjgw4>.

⁵ DoD, *Electromagnetic Spectrum Superiority Strategy* at 1 (Oct. 2020), <https://rb.gy/3bytd>.

⁶ *Request for Comment* at 88 Fed. Reg. 16245.

⁷ Comments of Lockheed Martin at 6. Further, others have accused the U.S. Government of “hoarding spectrum.” See e.g., comments of Nicole Turner Lee at Back to the Spectrum Future Part II (May 4, 2023).

existence between and among like services, as opposed to relocation resulting from unlike services seeking to further expand their footprint.

Many proponents of the traditional conceptualization of a spectrum pipeline (*i.e.*, auctioning of federal bands for exclusive access) often ambiguously cite “national security” as a justification for why more spectrum needs to be made available for auction, *i.e.*, for exclusively licensed mobile wireless use. Ironically, the use cases which abstractly invoke “national security” often come at the expense of national security in the most literal sense of the term—such as the missions of the DoD’s multiple radar systems. This is due, in no small part, to the perhaps outdated notion that spectrum should be auctioned for licensed, exclusive-use, as opposed to encouraging the co-existence of like services in a given band. Lockheed Martin understands that there is likely to remain a need for some spectrum to be made available on an exclusive-use licensed mobile basis, though this should not be the default practice. Further, Lockheed Martin is unaware of the same level of scrutiny that policymakers apply to federal uses of spectrum—whether the bands or the bandwidth—being applied to the bands and bandwidth targeted by CTIA⁸—this is inherently detrimental to sound spectrum governance, as well as many national security spectrum use cases.

Indeed, there are commercial bands where obsolete technologies currently operate on a licensed, exclusive use basis which could be studied for repurposing, as opposed to those which house cutting-edge defense technologies and capabilities. This would accommodate U.S. leadership not only in U.S. manufacturing of national security capabilities, but new wireless services being accommodated in lower spectrum bands. As Lockheed Martin has previously discussed,⁹ U.S. technology leadership is multifaceted, and changes to a single facet have significant implications for other facets of that global leadership (*i.e.*, national security technology). In short, trying to regain leadership in 5G wireless technology development and manufacturing should not, and need not, come at the risk of losing U.S. A&D technology leadership.

b) The Spectrum Relocation Fund

As authorized by the Commercial Spectrum Enhancement Act, Title II of Pub. L. 108-494, the SRF provides a centralized and streamlined funding mechanism through which federal agencies can recover costs associated with their relocating radiocommunications systems or enabling co-existence in the same reallocated spectrum. Lockheed Martin applauds the underlying intent of the SRF, but recognizes that it has had multiple challenges in successful implementation. Many of the challenges can be addressed without statutory modifications; however, some improvements would likely require legislation.

Lockheed Martin believes that for the Armed Services, the SRF is critical to function well; for the 1755-1780 MHz band alone, the U.S. Navy estimates that moving to a new band would take more than a decade and cost over \$16 billion.¹⁰ The SRF is currently funded by the auction

⁸ Comments of CTIA at 36-38 (Docket No. 230308-0068).

⁹ Comments of Lockheed Martin at 6-8.

¹⁰ NTIA, Transition Plans and Transition Data for the 1755-1780 MHz Band (Sep. 30, 2020), <https://rb.gy/zm4j1>.

revenues from the spectrum band, from which federal users have to relocate or in which federal users are constrained to co-exist with the auction winners.

To date, the SRF has been interpreted in ways that have limited its ability to deliver on its intended goal of incentivizing federal agencies to identify spectrum that it could release or co-exist within if allowed to modify operations. Indeed, Lockheed Martin understands that agencies are being advised by the Technical Panel (“Panel”) that the SRF is not able to fund system upgrades, but rather just replacement of technology. This not only disincentivizes the level of effort necessary for co-existence,¹¹ but also deprives the American public of the advanced capabilities available to the agencies that serve them; in essence, such an interpretation would force federal agencies to undertake the massive effort of replacing currently operating technologies with technologies that are not state-of-the-art. As discussed below, published guidance to the agencies is necessary.

Presently and in addition to the funding of transition plans, SRF monies may be transferred to eligible federal agencies for pre-auction research and development, engineering studies, economic analyses, activities with respect to systems, or other planning activities.¹² Overall, these activities are intended to improve the effectiveness of spectrum use for the purpose of making available for auction qualifying frequencies not yet identified for auction, but assigned to federal entities. Lockheed Martin supports clarifications or updates to the SRF with the aim of preserving agencies’ ability to conduct their missions, while incentivizing spectrum co-existence where feasible—in *both* federal and non-federal bands. Such clarifications or updates include:

- **Clarifying that SRF funds may be used to acquire state-of-the-art technology replacements:** statute is explicit that the “relocation or sharing costs” for which SRF funds may be used include “the acquisition of state-of-the-art replacement systems intended to meet comparable operational scope, which may include incidental increases in functionality.”¹³ Further, “relocation and sharing costs” includes both the costs incurred by a federal entity in connection with the auction of spectrum *or* the sharing of spectrum frequencies (*i.e.*, spectrum co-existence).¹⁴ However, as noted above and notwithstanding the language of the statute, Lockheed Martin understands that agencies are being informed that the SRF cannot be used to fund state-of-the-art replacements. Given the disparity between what is statutorily provided for and what is being communicated to agencies, Lockheed Martin recommends that the NTIA clarify and amplify that state-of-the-art upgrades are covered under the SRF.
- **Clarify that agencies have the ability to retain funds for short- and long-term transition plans:** SRF funds are to be credited to the appropriations account of the agency subject to eligible relocation or sharing activities, and are to remain available

¹¹ Note, this should not be interpreted as an endorsement for the burden of developing co-existence technologies to fall with a band’s incumbent. As elsewhere stated, Lockheed Martin believes that new entrants must be required to have *proven* co-existence technologies or methodologies as well. *E.g.*, Comments of Lockheed Martin at 22.

¹² 47 U.S.C. 928(g)(2)(A).

¹³ 47 U.S.C. 923(g)(3)(B)(ii).

¹⁴ 47 U.S.C. 923(g)(3)(A).

“until expended.”¹⁵ The use of “until expended” should identify SRF monies as a no-year appropriation, meaning that the monies will remain available to the agency for an indefinite period.¹⁶ The Office of Management and Budget (“OMB”) has also acknowledged that SRF funds “will remain available until expended” and that “accounts that have received transfers from the SRF should be reapportioned with the start of each new fiscal year, until relocation activities are completed.”¹⁷ However, Lockheed Martin understands that there is confusion within the interagency process, specifically as to whether SRF monies that are not expended in the year in which they were transferred must be returned back to the SRF, *i.e.*, SRF monies are treated as a single-year appropriation. Accordingly, Lockheed Martin recommends that NTIA, in accordance with statute and OMB guidance, clarify and amplify that SRF monies are made available until expended,¹⁸ and not for a single year.

- **Allow excess funds to be used for research and development (“R&D”):** not later than eight (8) years after their deposit into the SRF, and after the payment of eligible relocation or sharing costs, monies within the SRF are to revert to and be deposited in the general fund of the U.S. Treasury for the sole purpose of deficit reduction.¹⁹ In effect, and unless OMB and NTIA notify Congress that SRF funds are needed to complete or implement current or future relocation or sharing arrangements,²⁰ there is an eight (8) year shelf life for funds within the SRF. Lockheed Martin proposes to modify the SRF such that funds *do not* revert to the general fund, and remain available within the SRF such that they must be spent on R&D related to relocation or co-existence within 10 years. Ensuring that funds remain in the SRF minimizes the SRF’s reliance on future auctions as a source of funding, and incentivizes agencies to conduct R&D related to spectrum co-existence solutions. Further, that certain policymakers and interest groups view spectrum auctions as a pay-for for other non-spectrum related activities, keeping money within the SRF will help ensure its future ability to fund R&D, should future auction proceeds be diverted away from the SRF.
- **Allow agencies to use funds for pre-decisional R&D:** SRF funds may be requested by agencies for research and development related to improving the “efficiency²¹ and effectiveness” of spectrum used by federal agencies, with the goal of making more spectrum available for non-federal users.²² Lockheed Martin recommends clarifying that

¹⁵ 47 U.S.C 928(e)(1)(C).

¹⁶ See Government Accountability Office, Principles of Federal Appropriations Law: The Legal Framework at 2-9 (4th ed. 2016 rev.)

¹⁷ OMB Memorandum for Heads of Executive Departments and Agencies: Spectrum Relocation Fund Guidance, M-09-01 (Oct. 14, 2008).

¹⁸ Notwithstanding the retransfer requirements found at 47 U.S.C. 928(e)(2).

¹⁹ 47 U.S.C. 928(d)(4).

²⁰ *Id.*

²¹ Lockheed Martin has previously cautioned against attempts to characterize spectrum use as “efficient”, as the term fails to account for how different systems operate and their spectrum requirements. See *e.g.*, Comments of Lockheed Martin at 12-13.

²² 47 U.S.C. 928(g).

agencies can use the SRF to fund pre-decisional R&D, even if conducted by federal contractors. As the entities that conduct research, development, test & evaluation (“RDT&E”) and sustainment activities related to federal systems, contractors are uniquely suited to conduct R&D related to improving the “efficiency and effectiveness” of these and future federally utilized systems. Further, SRF-funded contractor pre-decisional R&D would allow agencies to leverage contractors’ vast physical infrastructure and human capital, which is already oriented around R&D activities.²³

- **Require that SRF funding denials or transition plan rescoping be reported to Congress:** at present, nothing within the provisions governing the SRF and the Technical Panel require that agency SRF funding denials or disputes between the Panel and an agency be reported to Congress. Lockheed Martin recommends that both funding denials and transition plan disputes be formally reported to the appropriate congressional committees within 30 days of denial or after the initiation of a dispute for which no resolution has been reached. This would enhance transparency in the SRF and transition plan process, thereby increasing Congress’ situational awareness of the SRF’s administration. Furthermore, it would also highlight where the SRF may need to continue to evolve to meet its statutory intent. Historically, Lockheed Martin understands that there have been instances where the Panel has rejected and sought to redefine an agency’s spectrum requirements through system redesigns—a problematic development given that agencies themselves know best their mission and the mission’s requirements. Lockheed Martin believes that, in creating the Panel, it was not Congress’ intent to imbue the Panel with the ability to substitute its view for the expertise of agency program offices regarding system design and requirements. Further, Lockheed Martin notes that, while there is a dispute resolution process for disputes between a federal entity and a non-federal entity regarding transition plans,²⁴ federal agencies themselves are provided no similar recourse (in relation to the Panel).
- **Clarifying Technical Panel membership:** the Panel is currently comprised of three (3) members, one each appointed by the Director of OMB, the Assistant Secretary (for Communications and Information), and the Chair of the Federal Communications Commission (“FCC”). Lockheed Martin understands that some federal agencies interpret the existing regulations to mean that a nominating agency need not hold any authority over the technical panel member it appoints. Accordingly, Lockheed Martin recommends that each member of the technical panel must be an employee of its nominating agency who is performing duties on the technical panel as a full time federal employee of their respective agency. Current regulations state that “the member should be” a federal employee or special government employee.²⁵ Given the increasing complexity of

²³ In 2022 alone, Lockheed Martin invested \$3.4 billion in independent research and development (*i.e.*, company-funded R&D) and capital investments to accelerate the capabilities its customers need and for its operations to meet those needs.

²⁴ 47 U.S.C. 923(i).

²⁵ 47 C.F.R. 301.100(b)(ii).

spectrum governance, it is important that the technical panel be above reproach or perception of conflicts of interest. Further, panel members are each to serve for 18 months,²⁶ with no individual serving longer than one consecutive term. Lockheed Martin fully supports implementation of this rotation requirement.

c) *Ensuring the Continued Operation of A&D Contractor Facilities*

Lockheed Martin applauds NTIA for having already recognized that U.S. A&D industry facilities must retain access to spectrum utilized by the systems they develop pursuant to federal contracts; specifically, the NTIA’s writing to the FCC in the context of the 3.45 GHz band that A&D industry facilities “require access to [the band] to perform experimentation and testing for radionavigation and other systems contracted for by federal agencies.”²⁷ Further, NTIA stated, “It is *critical that these facilities retain access to the spectrum* [(emphasis added)] for this testing and experimentation to ensure that agencies’ contracting requirements can be fulfilled.”²⁸ The FCC has also noted the need for A&D contractor facilities to retain access to the spectrum for RDT&E and sustainment activities.²⁹

As Lockheed Martin explained in its initial response to the *Request for Comment*, federal A&D contractor facilities support national security critical RDT&E and sustainment, and critical design review (“CDR”)³⁰ activities throughout the lifetime of military systems.³¹ For this reason, the U.S. A&D industry is uniquely situated in that, while a private sector industry, its spectrum access requirements are often inexorably linked to the spectrum requirements of its customer base—the federal agencies. To conduct RDT&E and sustainment activities for systems ultimately operated by federal agencies, or foreign allies through FMS, the U.S. A&D industry must be ensured access to the same spectrum these systems will ultimately be operated on.

Regarding the 3.45 GHz band specifically, as directed by the MOBILE NOW Act, NTIA evaluated the feasibility of allowing commercial wireless services shared access to the 3100-3550 MHz band, under the assumption of no changes to incumbent operations, “except for possibly limiting some use of airborne radar systems over the continental United States.”³² The NTIA worked with DoD to evaluate conditions needed to enable commercial services to operate in the 3450-3550 MHz band without causing impact to incumbents. Following this assessment, the 2020 America’s Mid-Band Initiative Team report (“Report”) set an objective to make 100 megahertz of contiguous spectrum available within the 3450-3550 MHz band, in part, by revising DoD operations. Notably, while the Report did include protections from commercial

²⁶ 47 U.S.C. 923(h)(3)(B)(iv).

²⁷ Letter from Charles Cooper, Associate Administrator, NTIA, to Ronald T. Repasi, Acting Chief, Office of Engineering & Technology, and Donald K. Stockdale, Jr., Chief, Wireless Telecommunications Bureau, FCC at 6, WT Docket No. 19-348 (Feb. 19, 2021).

²⁸ *Id.*

²⁹ Lockheed Martin Request for Part 90 Special Temporary Authority to Operate Two Radiolocation Service Sites in the 3.45 GHz Band at ¶¶ 17-18, ULS File No. 0009581172, Order (rel. Jun. 16, 2021).

³⁰ The CDR provides the acquisition community with evidence that the system, down to the lowest system element level, has a reasonable expectation of satisfying the requirements of the system performance specification as derived from the Capability Development Document within current cost and schedule constraints.

³¹ Comments of Lockheed Martin at 17.

³² NTIA, *Feasibility of Commercial Wireless Services Sharing with Federal Operations in the 3100-3500 MHz Band* at 1 (Jul. 2020), <https://rb.gy/i0ufz>.

operations in the 3450-3550 MHz band for DoD ranges and *de facto* (by way of proximity) protections for DoD contractor facilities adjacent to such ranges, contractor facilities not adjacent to DoD ranges were never discussed in the Report, and thus received no such protection from commercial operations.

There remains a fundamental misunderstanding of the nature of the U.S. A&D industry and its operations among some policymakers and other industries. Requiring A&D participants to participate in auctions to maintain spectrum access would: (1) add increased costs to federal procurements, likely leading to significant contract re-negotiations that may drag on for years and result in delayed system deliveries; (2) create significant uncertainty regarding the ability to conduct RDT&E and sustainment operations for critical national security systems, given that there is no guarantee of winning an auction; (3) unfairly advantage A&D contractors with facilities in locations of less interest to other auction bidders, increasing their own likelihood of winning (and potentially at a lower relative price than in other areas) relative to A&D facilities in locations with greater auction interest, thereby decreasing competition between industry participants; and (4) would only serve to reinforce the zero-sum spectrum policy paradigm—either the A&D contractor wins the necessary license, or someone else—NTIA has rightly sought to move away from.

Believing that A&D facilities can simply be relocated is a similarly uninformed position. DoD contractor facilities represent massive fixed capital investments, and are significant contributors to their communities—often for decades prior to a spectrum auction’s announcement. Relocation of ongoing RDT&E and sustainment work to cooperative planning areas (“CPA”) and periodic use areas (“PUA”) is not a tenable solution, imposing significant potential risks, delays, and costs to current and future contracts, and detrimental impacts to the A&D workforce. Further, the federal ranges within CPAs and PUAs—provided relocation proponents do not expect contractors to build entirely new facilities—have limited capacity to expand use to accommodate additional tests that might be displaced from DoD contractor sites that have already been significantly expanded to accommodate demanding test schedules, and do not have the specialized test facilities required for the development of leading-edge technologies. In addition, federal test ranges do not have the unique personnel skills required for ongoing program operations.

For these reasons, NTIA must ensure that those who conduct the RDT&E and sustainment of federal systems be afforded the same protections as the operators of these systems (*e.g.*, the agencies).

III. Conclusion

Sufficient access to spectrum is critical to a wide range of economic stakeholders, as well as from the U.S. national security stakeholder perspective. Spectrum supports not only the functions of civil society as well as the needs of American consumers, but also federal, state, and local government operations and missions in support of their residents and citizens. Lockheed Martin’s above comments expand upon and reinforce concepts first introduced in its initial response to the *Request for Comment*. These concepts are crucial to ensuring the development of

a spectrum strategy that recognizes and provides for the needs of all spectrum users, whether federal or non-federal and irrespective of spectrum access model.

Lockheed Martin again thanks NTIA for its work to develop the National Spectrum Strategy and looks forward to working with NTIA on this vital issue for the Nation.

Respectfully submitted,

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