

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

In the Matter of)	
)	
Expanding Flexible Use in Mid-Band)	GN 17-183
Spectrum Between 3.7 and 24 GHz)	

**REPLY COMMENTS OF
SPEEDCAST COMMUNICATIONS, INC.**

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Summary

In these comments, Speedcast Communications, Inc. (“Speedcast”) urges the Commission to proceed cautiously as it considers spectrum access issues in this proceeding. C-band earth station facilities play a critical role in distributing video content throughout the United States; connecting remote, rural and at-risk areas such as communities in Alaska, Puerto Rico and the U.S. Virgin Islands; providing critical operational connectivity for off-shore oil platforms, commercial shipping, and other maritime sectors using earth stations aboard vessels (“ESVs”); and facilitating communications links between the United States and other countries in the Americas.

In many cases, these services cannot be delivered via terrestrial means and, in all cases, relocation of C-band earth station facilities – geographically or spectrally – would be costly and difficult. The Commission, therefore, should exercise great care to minimize the impact of any actions it takes on incumbent C-band earth station licensees. In particular, Speedcast emphasizes the importance of protecting incumbent C-band gateway operations that rely on the Commission’s existing regulatory policies (*i.e.*, full-band, full-arc licensing) to provide vital satellite connectivity services to users in the United States and around the world.

Introducing new terrestrial services in the band should be structured in a way that mitigates C-band earth station licensee cost and operational burdens, and minimizes customer disruption. Speedcast urges the Commission to consider *not* permitting for new terrestrial operations in the sensitive downlink spectrum at 3700-4200 MHz, but only in the C-band uplink spectrum from 5925-6425 MHz, which is likely to present an easier and more straightforward spectrum sharing scenario with terrestrial broadband applications. In addition, the Commission should adopt sharing and spectrum access principles that protect incumbent operations and, to the extent necessary, create a process under which new terrestrial entrants compensate incumbent

C-band satellite service providers for costs incurred to mitigate interference, relocate their facilities, or abandon their businesses altogether.

With respect to the Intel-Intelsat proposal, Speedcast urges the Commission to recognize that while there may be some merit in the principles reflected therein, the proposal includes only the interests of those two parties. It does not – and indeed cannot – reflect the regulatory and commercial interests of the broader universe of C-band earth station operators and service providers in the United States. Any spectrum sharing agreement negotiated between these self-appointed industry representatives discounts a wide range of individual circumstances, concerns, constraints, and considerations faced by other industry participants. Spectrum sharing with terrestrial services does not happen at the geostationary arc; it happens on the ground where earth station operators and service providers deliver gateway and end-user services. All C-band earth station operators and service providers must have a seat at any table where spectrum access issues that are fundamental to their business are considered.

Still, to the extent the Commission seeks to introduce terrestrial operations in a portion of the C-band where spectrum compatibility may be more challenging, Speedcast agrees that there must be appropriate economic incentive and compensation to motivate earth station operators and satellite service providers to undertake the extensive efforts that will be required to share with new and expanded terrestrial broadband services.

Table of Contents

I.	Introduction and Background	2
II.	The Commission Should Protect Incumbent C-Band Earth Station Operations	3
	A. C-Band Gateway and Gateway-Like Operations, as well as Rural and Remote Access, Should Be Protected Against Interference from New Entrants	4
	1. C-Band Spectrum Supports Important and Diverse Satellite Services	4
	2. Operational Challenges of C-Band Downlink Spectrum Sharing between C-band Gateways and New Terrestrial Entrants	6
	a. Infrastructure-Related Issues	6
	(1) Paired Uplink-Downlink Frequencies	6
	(2) Gateway Facilities Would Be Difficult and Costly to Relocate	7
	(3) Terminal Limitations	7
	b. Spectrum-Related Issues	8
	(1) LNB Saturation, Intermodulation and Other Interference Issues	8
	(2) “Full band, Full Arc” Flexibility Is Essential	9
	(3) The Commission Should Recognize Sharing Challenges, and Await the Outcome of ITU Studies	10
	c. Commercial Issue: Long-term Transponder Leases and Service Agreements	12
	B. If the Commission Introduces New Terrestrial Mobile Services, It Should Look First to the Uplink Band at 5925-6425 MHz	13
III.	The Commission Should Require Any New Terrestrial Entrants to Compensate Incumbent Licensees for the Costs of Interference Mitigation, Relocating their Facilities, or Abandoning Their Businesses	14
IV.	The Intel-Intelsat Proposal Has Significant Limitations	17
	A. The Intel-Intelsat Proposal Reflects a Limited Subset of Industry Viewpoints	18
	B. Speedcast Agrees that Principles of Economic Efficiency Dictate Compensation to Incumbent Licensees	19
V.	The Commission Should Consider the Recent BAC Petition in the Context of the Mid-Band NOI	20
VI.	Conclusion	22

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REPLY COMMENTS OF SPEEDCAST COMMUNICATIONS, INC.

Speedcast Communications, Inc. (“Speedcast”) hereby replies to comments submitted in response to the Federal Communications Commission’s (“the Commission”) Notice of Inquiry in the above-captioned proceeding.¹ Speedcast agrees with multiple commenters that the Commission must proceed cautiously in exploring the possibility of expanded terrestrial operations in the 3700-4200 MHz (space-to-Earth) and 5925-6425 MHz (Earth-to-space) bands and protect incumbent C-band fixed-satellite service (“FSS”) operations.

Today, incumbent C-band satellite and gateway earth station operators, as well as satellite service providers, deliver critically-needed communications to rural, remote, and underserved areas of the United States, as well as throughout the Americas and around the world. These satellite-based services support disaster recovery, public safety, national security, video distribution, international backhaul, enterprise services, and other commercial uses in critical industries, and the services cannot readily be delivered by other means.

The introduction of additional terrestrial wireless broadband services in the C-band – particularly the downlink band where high-power base station and mobile device transmissions overwhelm sensitive earth station receive operations – risks severe disruption of the operation of the gateway and end-user earth stations supporting these services. It would therefore serve the

¹ *Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz*, Notice of Inquiry, GN Docket No. 17-183 (rel. Aug. 3, 2017) (the “NOI”).

public interest to protect C-band earth stations from harmful interference caused by any new terrestrial services in the band. If such interference cannot be avoided, it is vital for the Commission to establish a compensation mechanism under which these new entrants must bear the costs that earth station operators and satellite service providers will incur in mitigating interference, relocating their facilities, or abandoning their businesses.

I. Introduction and Background

Speedcast, a global provider of satellite-based communications services, continues to make significant investment in C-band earth station facilities and satellite capacity to provide critical communications services for customers in the energy, mining, maritime, and government services sectors in the United States and throughout the world. The 3700-4200 MHz and 5925-6425 MHz bands are essential for Speedcast's ongoing operations, and the introduction of additional terrestrial users in the C-band, without adequate protections, would have grave impacts on their ability to provide reliable service to users that rely on satellite connectivity.

The recent acquisition of Harris CapRock Communications, Inc. has significantly increased Speedcast's C-band gateway earth station assets in the United States,² including teleport facilities in Houston, Texas, which are used to support services to customers located offshore, as well as in remote locations in the United States and elsewhere. The Commission's current licensing regime provides Speedcast with the operational flexibility to operate multiple gateway antennas in various orientations at its teleports to serve various customer needs; and to adjust its operations in response to emergencies and other exigent circumstances such as communications restoration and disaster recovery situations.

² See Speedcast Communications, Inc., File Nos. SES-T/C-20161107-00880, Call Sign E000015 & SES-T/C-20161107-00874, Call Sign E030159.

The ability to operate on a “full-band, full-arc” basis throughout the C-band is an integral part of Speedcast’s commercial operations and affords the flexibility to serve diverse customer requirements. Other satellite service operations in the band, such as video distribution to cable headends, may require similar flexibility. Introducing new terrestrial wireless broadband services without adequate protection to incumbent hub earth station operators and satellite service providers would adversely impact the provision of satellite services to U.S. customers in a wide range of sectors including energy production, commercial shipping, banking, content distribution, and international telecommunications, thereby putting their operations at risk.

II. The Commission Should Protect Incumbent C-Band Earth Station Operations

The C-band is critical for earth station operations throughout the United States, particularly for gateway earth stations that support essential broadband satellite communications to rural areas and remote locations and for content distribution applications. The record shows that C-band gateway and gateway-like receive earth stations are used extensively to supply a broad range of services that play a critical role in enabling communications in the United States and globally. The Commission itself noted the array of services supplied using the C-band, including “providing broadband Internet service to consumers (particularly in rural areas), enabling communications on board planes and ships, delivering television programming to cable headends, providing data connectivity for merchant credit card transactions, and supporting corporate data networks.”³

The importance of Commission policies that have enabled the development of these diverse C-band satellite operations cannot be overstated, and the Commission must proceed

³ See NOI at ¶ 8.

cautiously in considering new terrestrial broadband uses of this spectrum that would impair the operation of these incumbent licensees' services or reduce their operational flexibility.

A. C-Band Gateway and Gateway-Like Operations, as well as Rural and Remote Access, Should Be Protected Against Interference from New Entrants

Speedcast urges the Commission to protect C-band gateway and gateway-like operations, as well as those supporting rural and remote connectivity, and grandfather such operations under its existing regulatory regime that has enabled C-band satellite services to become a vital part of the U.S. telecommunications ecosystem. C-band gateway facilities enable reliable service to a wide range of users, including “customers residing in the most rural and remote areas of the country who rely exclusively on satellite technology”⁴ for emergency communications and basic connectivity needs. And, of course, these users rely on access to C-band spectrum to receive these communications services.

Any Commission action that would create significant new sources of harmful interference to C-band gateways, as well as rural and remote earth stations, would impair their ability to meet the vital role that they play in enabling C-band satellite communications services across the country. Given the dearth of terrestrial alternatives available to Speedcast's customers, such a result would disrupt communications that are essential for the safety and operation of remote infrastructure with national security and economic importance.

1. C-Band Spectrum Supports Important and Diverse Satellite Services

Fixed Satellite Service (“FSS”) networks use C-band spectrum efficiently and robustly and require maximum spectrum flexibility to effectively serve customers. C-band gateway earth stations serve customers around the nation and throughout the world, and require flexibility to

⁴ Comments of General Communications, Inc., GN Docket No. 17-183 (“GCI Comments”) at 2.

communicate with C-band satellites across the geostationary arc, in order to reach whichever satellite both has available capacity and is “in view” of the gateway and customer terminal, wherever it may be located at the time of the communication. By operating in this way, gateway earth station operators allow their customers to “enjoy great[] connectivity that extends to the most remote areas of the country,”⁵ as well as throughout the Americas.

C-band gateway earth stations support remote terminals located onshore and offshore, as well as ESV terminals in offshore locations. Speedcast’s customers often require broadband connectivity to locations that terrestrial service simply cannot reach, such as cruise ships, merchant vessels, oil platforms, ferries, mines, or other remote sites, where the very infeasibility of terrestrial options necessitates the use of satellite services.⁶ Without the support of C-band gateway earth stations, which are generally located at large teleport facilities throughout the United States, these important remote and mobile satellite operations would cease to function.

New terrestrial operations in the vicinity of these hub earth stations would create interference that would limit the ability of these gateways to support their important operations, and leave their customers with limited or no communications alternatives. Because teleport facilities are relatively limited in number, however, it may be possible to implement deployment limitations, operational restrictions, or other measures to protect these sites from harmful interference so that they may continue to support important communications operations. Gateway-like C-band receive earth stations supporting video distribution at cable headends are greater in number but may be similarly protected. Finally, it may be possible for C-band earth

⁵ Comments of SES Americom, Inc., GN Docket No. 17-183 (“SES Comments”) at 5.

⁶ See Comments of the Satellite Industry Association, GN Docket No. 17-183 (“SIA Comments”) at 13-14 explaining that, “these devices have enabled significant expansion of the communications options available to crew members and passengers on U.S. Navy vessels, cruise ships, ferries, barges, and container ships”).

stations to operate in rural and remote areas because additional terrestrial wireless broadband spectrum may not be needed to provide services in less populated areas.

2. Operational Challenges of C-Band Downlink Spectrum Sharing between C-band Gateways and New Terrestrial Entrants

Substantial technical, operational, and commercial concerns inform the need to protect existing C-band gateway operations at their current locations and grandfather them if the Commission determines to pursue sharing of this band with new or expanded terrestrial broadband entrants

a. Infrastructure-Related Issues

(1) Paired Uplink-Downlink Frequencies

The introduction of new terrestrial mobile services in the C-band downlink spectrum would have immediate and profound adverse operational implications for incumbent gateway operators that could preclude continued use of their existing facilities. C-band satellite systems incorporate hard frequency pairings, meaning that information uplinked to the satellite on any given uplink frequency is automatically downlinked by the satellite on a predetermined frequency. Limitations on the range of downlink frequencies places a direct, corresponding limit on the usability of the uplink band and vice versa. As a result, any reallocation or restriction on access to spectrum would have a double impact by making the paired band equally unusable.

Any curtailment on C-band spectrum access also would have extra-territorial effects throughout the Americas. Because C-band gateways support communications services throughout the region – including international backhaul, oil and gas, and maritime applications – any limitation on access to downlink spectrum (and the inevitable corresponding impact on use of paired uplink spectrum) would resonate beyond U.S. borders to curtail these important services. Furthermore, interference at the gateway location that prevents monitoring the entire

range of C-band downlink frequencies also would effectively preclude service providers from diagnosing and correcting communications traffic issues. This would have an immediate adverse impact on Speedcast's day-to-day operations and would make it difficult to effectively provide commercial services in this band within the United States and internationally.

(2) Gateway Facilities Would Be Difficult and Costly to Relocate

Today's gateway facilities are typically large installations with multiple large satellite transmit and receive antennae. They are located at sites chosen after extensive analysis of the spectrum environment and careful coordination with other licensees. Environmental protection, historical preservation, zoning, permitting, land use, and other planning processes are lengthy and costly to complete, and the specialized equipment is costly to purchase and install. Once the earth station has been constructed, a highly trained and specialized workforce is needed to operate and maintain it.

Introduction of new terrestrial mobile users without proper protection for incumbent gateway earth stations would likely require the physical relocation of these capital-intensive facilities and the transfer and/or replacement of specialized staff. That process of physically relocating the multiple large gateway antennae present at a single gateway, as well as the associated specialized staff and equipment, could easily take years, with costs running into many millions of dollars.

(3) Terminal Limitations

In most instances, C-band gateways and customer C-band terminals alike have fixed capabilities set to particular frequencies that cannot be easily adjusted between C-band, Ku-band or other FSS bands. Thus, if the Commission were to adopt rules that *de jure* or *de facto* limit satellite usage of the full C-band downlink spectrum, service providers would likely need to

replace all of their gateway and even all of their customer terminal equipment to comply. Needless to say, this would be an extremely costly and time-consuming process.

b. Spectrum-Related Issues

(1) LNB Saturation, Intermodulation and Other Interference Issues

The introduction of ubiquitous, high-power base station or mobile terrestrial transmissions anywhere in the C-band downlink spectrum could effectively prevent the entire band from being used for satellite operations. Unlike existing point-to-point microwave services in the band – which are coordinated and licensed at fixed locations for transmission at specific channel frequencies, power levels, and directions – high-power base station and unpredictable mobile transmissions can overwhelm the ability of the earth station to receive low-power satellite transmissions anywhere in the band, cause intermodulation effects, and create other interference issues.

Uncoordinated terrestrial broadband transmissions in any portion of the 3700-4200 GHz band would risk saturation of the low noise block (“LNB”) downconverter across the entire C-band, thus preventing reception of downlink transmissions from C-band satellites anywhere in the band. In this regard, Speedcast highlights the comment made by General Communication Incorporated (“GCI”) that “the presence of even small amounts of external, intentional radiator energy can easily overwhelm the input signal limits of a low-noise amplifier and saturate it,” impairing the ability of the earth station to effectively receive the signal.⁷

This would remain an issue, even if the Commission were to introduce new terrestrial mobile or unlicensed operations in only a portion of the C-band downlink spectrum. In order to maintain performance in the remaining portion of the band, it would likely be necessary in many

⁷ GCI Comments at 15.

cases to completely replace the LNB downconverter with one that receives only the remaining FSS-only frequencies. Even then, as a result of LNB design, high-power terrestrial transmissions at the band edge would impair the use of spectrum in the allocated satellite receive band near those transmissions. Filtering also could not address this band-edge problem; even the best filters on the market would leave up to 100 MHz of adjacent earth station receive spectrum unusable.

FSS service providers would incur substantial implementation costs associated with either approach – such as costs of equipment, labor, and downtime for earth station equipment modification – as well as ongoing impacts on service performance and flexibility. While measures such as radio frequency screening and imposition of power limits around receive earth station sites may facilitate some sharing, albeit with costs that must be considered by the Commission, it is not at all certain that interference can be effectively addressed through these and other interference mitigation measures.

(2) “Full band, Full Arc” Flexibility Is Essential

Speedcast relies on the spectrum flexibility afforded by the Commission’s rules (i.e., full-band, full-arc licensing) to efficiently shift frequencies and satellites in the event of a transponder or satellite failure or market conditions. Much like GCI, which makes extensive use of the entire C-band to support rural and remote areas throughout Alaska,⁸ Speedcast coordinates and effectively utilizes the entire 3700-4200 MHz and 5925-6425 MHz bands to support critical remote operations. Spectrum relocation to subsets of C-band frequencies would effectively preclude Speedcast from continuing to provide the quality and reliability of services that customers have come to expect.

⁸ GCI Comments at 10.

Speedcast agrees with GCI that the ability for hub facilities to utilize the full C-band spectrum mitigates coverage, capacity, and interference issues that are unique to the provisioning of satellite services in rural and remote areas.⁹ Forcing many of these critical services to relocate to only a portion of C-band spectrum could result in life-threatening situations because it would not allow satellite operators the spectrum resources to effectively manage a crisis or emergency. Satellite networks intensively use C-band frequencies, fully reusing the spectrum at each orbital location (e.g., dual polarization) and multiplying that reuse with satellites spaced two degrees apart across the arc.

The record demonstrates that the flexibility provided by the ability to reuse spectrum across the entire C-band serves a number of public interest objectives, including allowing rapid restoration of service in the event of an outage, permitting adjustments in response to changes in customer requirements, and facilitating resolution of interference issues. In addition, satellite operators rely on the ability to shift customer traffic among transponders and satellites to optimize network loading and resolve interference.

(3) The Commission Should Recognize Sharing Challenges, and Await the Outcome of ITU Studies

The separation distances necessary to protect gateway satellite earth stations would impose significant operational limits on terrestrial mobile service providers in the C-band downlink spectrum. Although terrestrial point-to-point fixed services employ highly directional antennas that reduce the breadth of their interference footprint, terrestrial transmitters operate at power levels designed to close links tens of kilometers long and consequently must be separated from receive earth stations by significant distances as well.¹⁰ Fixed Point to Multipoint

⁹ *Id.*

¹⁰ *See* SES Comments at 5.

(“P2MP”) services create an interference footprint similar to that of mobile service base stations, as they are no longer highly directional but seeking to cover a wide area. Moreover, the large numbers and broadly scattered locations of C-band satellite receive terminals leave little or no opportunity to deploy new terrestrial facilities at sufficient distances to avoid interference problems. These issues are exacerbated by the fact that thousands of receive earth stations are unregistered.

In a recent Statement regarding introduction of terrestrial mobile services in the C-band, the United Kingdom’s Office of Communications (“Ofcom”) acknowledged that coexistence of those services with incumbent gateway earth station operations presented substantial challenges.¹¹ Ofcom concluded that – based on consultation with hub earth station licensees, including Speedcast – the establishment of “restriction zones” around existing facilities would be imperative to protect incumbent satellite operations.¹² These restriction zones “would place technical restrictions on a mobile network operator deploying base stations in the immediate vicinity of satellite earth station sites. For example, this might require MNOs to take steps to mitigate interference when deploying base station sectors in the direct line of sight of a receiving dish within a specified area or to reduce transmit power.”¹³ The 1-3 km radius of the restriction zone discussed by Ofcom is likely to be inadequate for a hub earth station, but the principle illustrates the importance of protection for incumbent C-band hub earth station operations.

¹¹ See Ofcom, *Statement on Improving Consumer Access to Mobile Services at 3.6 GHz to 3.8 GHz* (rel. Oct. 26, 2017) (“Ofcom Statement”), at ¶ 2.32 (finding that UK-wide 5G macrocell network deployment “would be likely to undermine benchmark spectrum quality for existing registered satellite earth station or fixed link band users”) (available at: https://www.ofcom.org.uk/_data/assets/pdf_file/0019/107371/Consumer-access-3.6-3.8-GHz.pdf).

¹² *Id.* at ¶ 4.31.

¹³ *Id.*

Moreover, at the World Radio Conference 2015 (“WRC-15”) the International Telecommunications Union (“ITU”) acknowledged the need for additional study regarding the potential for sharing and coexistence of terrestrial mobile, fixed, and satellite services. The Commission should not prejudge the outcome of that process until it is complete, and the results are considered at WRC-19.

c. Commercial Issue: Long-term Transponder Leases and Service Agreements

In addition to the spectrum and infrastructure issues discussed above, allowing for additional broadband terrestrial use in the C-band would inevitably require existing hub operators to revisit long-term commercial arrangements with space station operators. Generally, a gateway/hub earth station operator enters into a long-term lease agreement with one or more satellite operators to utilize fixed bandwidth frequency channels on the satellite. Rarely does an earth station have unfettered access to the entire uplink or downlink band, but rather it is permitted to use certain frequencies or transponders for the provisioning of services, which must be coordinated on a regional basis, given the large footprint of C-band downlink signals. If interference from new terrestrial mobile or unlicensed uses makes certain C-band spectrum unusable for satellite downlink operations, it would require extensive renegotiation of these agreements between service providers and satellite operators. There is no guarantee that this time-consuming and costly process would successfully identify alternative C-band capacity, thus lapses in or full termination of services to customers may result.

Service agreements between C-band service providers and their customers raise similar issues. These long-term agreements and the underlying licenses would need to be renegotiated or broken, and the equipment reprogrammed or replaced. Either could result in loss of service or significant additional costs to the parties involved.

B. If the Commission Introduces New Terrestrial Mobile Services, It Should Look First to the Uplink Band at 5925-6425 MHz

To the extent that the Commission determines there is a need for additional spectrum for new terrestrial operations, Speedcast urges the Commission to consider permitting such operations in conventional C-band uplink spectrum from 5925-6425 MHz, which the Commission recognized as potentially “suitable for licensed wireless broadband,”¹⁴ rather than in the downlink band. While the record contains arguments against unlicensed use of this band,¹⁵ licensed terrestrial fixed services already operate in FSS uplink bands and the 5925-6425 MHz band is likely to present an easier and more straightforward spectrum sharing scenario with terrestrial broadband applications.

Whereas ubiquitous, high-power mobile base station transmissions in extended C-band frequencies would effectively overwhelm FSS receive operations across the entire C-band because they can saturate sensitive earth station receivers, mobile base stations can be deployed around FSS uplink sites with minimal interference into terrestrial broadband operations. While issues such as aggregate interference into satellite receivers must be considered, FSS uplink spectrum presents fewer interference concerns and a more realistic opportunity for co-existence between terrestrial broadband and satellite services.

In the uplink portion of the C-band, because earth stations would be transmitting rather than receiving, interference from terrestrial services would not be a factor. Earth stations transmitting in this band are also less likely to interfere with hypothetical terrestrial mobile services because FSS earth stations transmit at high elevation angles upwards toward the GSO

¹⁴ NOI at ¶ 31.

¹⁵ See Comments of AT&T Services, Inc., GN Docket No. 17-183 (“AT&T Comments”) at 15-17.

arc, with little energy radiated horizontally. This geometry sharply reduces the risk that FSS transmissions would interfere with horizontal, point-to-point terrestrial broadband transmissions.

Thus, given this much lower interference potential, if the Commission ultimately concludes that additional C-band spectrum must be allocated for terrestrial broadband use, Speedcast urges that the preferable candidate for sharing between FSS and wireless broadband is the FSS uplink band from 5925-6425 MHz.

III. The Commission Should Require Any New Terrestrial Entrants to Compensate Incumbent Licensees for the Costs of Interference Mitigation, Relocating their Facilities, or Abandoning Their Businesses

As demonstrated above, the introduction of new terrestrial services in the C-band will have significant technical, operational, and commercial impacts for incumbent C-band licensees and create costly tasks for operators. Accordingly, if the Commission introduces new terrestrial services in C-band, it should create a process under which new terrestrial entrants compensate incumbent C-band satellite service providers for the costs that incumbents will incur to mitigate interference, relocate their facilities or teleport operations, or abandon their businesses altogether. This compensation would ensure that the decision to undertake the transition to terrestrial broadband services in this band is, in fact, economically efficient: if access to this spectrum is a commercial imperative of terrestrial broadband services, then it will prove economically rational for the new terrestrial service providers to compensate the satellite incumbents to vacate the band.

Incumbent licensees should not bear the burden of proving the value of continuing to operate in accord with their license conditions for their full licensed term, or compensate new entrants for increased costs or foregone opportunities. The very purpose of the license is to grant the licensee (in this case, satellite service providers) sufficient predictability and certainty for a fixed term to permit them to invest capital, develop business, and incur contractual obligations

with customers. If new entrants or new technologies have emerged that create superior public benefits or opportunities for economic growth, then principles of economics dictate that the new providers should rationally be willing to compensate the incumbents for the costs of abandoning sunk investment in capital, relocating their operations, and breaking or restructuring their contractual commitments.

It is abundantly clear that the widespread replacement of gateway earth station and customer equipment, renegotiation or termination of customer contracts and satellite operator agreements, and relocation of personnel and facilities would be extremely costly and complicated undertakings. For example, LNB saturation from interference in the 3700-4200 MHz band could preclude satellite service providers from using any portion of the C-band unless and until they replace each hub LNB with one that does not receive those frequencies. And, even if a C-band service provider were to undertake that effort, it could not overcome the limitations imposed by hard-wired frequency pairings in the C-band satellites themselves. With less spectrum available, incumbent service providers would have diminished capacity to serve customers, with correspondingly more limited opportunities to earn revenue from their services. They should not be made to bear these financial burdens alone.

Indeed, in cases where it has determined that the public interest necessitates changes to the Commission's spectrum allocation decisions, to the detriment of incumbent licensees, the Commission has routinely required new entrants to compensate the affected incumbents. Recently, for example, when the Commission reorganized the 800 MHz band to accommodate the communications needs of public safety first responders and other emergency services, it

established a Transition Administrator to oversee the distribution of funds for service reconfiguration and spectrum relocation costs incurred by incumbents.¹⁶

More recently, the Commission used this principle to shape its Broadcast Incentive Auction. In broad strokes, mobile broadband service providers and UHF broadcasters participated in an integrated “forward” and “reverse” auction process, in order to identify opportunities for economically efficient reallocation of 600 MHz spectrum. The auction proceeds are being used both to compensate broadcasters that return some or all of their broadcast spectrum usage rights, and to reimburse remaining broadcasters and multichannel video programming distributors (“MVPDs”) the costs of more efficiently “repacking” into alternative channels using spectrum that will remain in broadcast use.¹⁷ As the Commission

¹⁶ See, e.g., *Improving Public Safety Communications in the 800 MHz Band*, WT Docket No. 02-55, Report and Order, Fifth Report and Order, Fourth Memorandum Opinion and Order, FCC 04-168, 19 FCC Rcd 14969 (2004), at ¶¶ 177-178 (“Band reconfiguration will be costly Under the band reconfiguration plan, the principal cost component will be borne by Nextel, which will pay for all channel changes necessary to implement the reconfiguration. Nextel is obligated to ensure that relocated licensees receive at least comparable facilities when they change channels.”), available at: https://apps.fcc.gov/edocs_public/attachmatch/FCC-04-168A1.pdf. See generally FCC 800 MHz Band Reconfiguration: <https://www.fcc.gov/general/800-mhz-spectrum>. See also 800 MHz Transition Administrator: <http://www.800ta.org/content/aboutus/>.

¹⁷ See generally *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, GN Docket No. 12-268, Report and Order, FCC 14-50, 29 FCC Rcd 6567 (2014) (“*Broadcast Incentive Auction Report and Order*”), at ¶¶ 25-26 (describing forward and reverse auctions), ¶ 35 (describing procedures to reimburse costs reasonably incurred by television stations that are reassigned to new channels in the repacking process, as well as by MVPDs to continue to carry such stations); *Post-Incentive Auction Transition*, MB Docket No. 16-306, Public Notice, “Incentive Auction Closing and Channel Reassignment Public Notice,” DA 17-314, 32 FCC Rcd 2786 (2017), at ¶ 2 (“Proceeds from the forward auction, i.e., winning bids net of credits for rural service providers and small businesses, total \$19,318,157,706, with 50 bidders placing winning bids for a total of 2776 licenses. The winning bids in the reverse auction total \$10,054,676,822. After covering reverse auction winning bids, reimbursement payments of up to \$1,750,000,000 for eligible broadcasters and MVPDs, and costs of conducting the incentive auction, forward auction proceeds totaling at least \$7,306,480,884 will be used to reduce the Federal deficit.”).

explained, “Our central objective in designing this incentive auction is to harness the economics of demand for spectrum in order to allow market forces to determine its highest and best use.”¹⁸

The Commission should similarly establish a mechanism under which new terrestrial mobile entrants at C-band would compensate incumbents, in order to ensure that the Commission has indeed identified the “highest and best use” of this valuable spectrum.

Furthermore, Speedcast posits that the Commission should permit future earth station deployment utilizing the C-band on a protected first-in-time basis. If demand for terrestrial broadband services is as high as anticipated, then providers of those services may be expected to build out terrestrial networks relatively quickly following the Commission authorization. If on the other hand, deployment lags, then satellite service providers should not be precluded from siting new earth stations that may become necessary to meet demand for their services in areas where they will not interfere with then-existing terrestrial operations. Once licensed, those earth stations should be protected to the same degree, and for the same reasons, as those that currently exist.

IV. The Intel-Intelsat Proposal Has Significant Limitations

The proposal put forth in the Intel-Intelsat Joint Comments for a voluntary approach to flexible terrestrial sharing, whereby incumbent “primarily affected C-band satellite operators” would “undertake voluntarily the . . . process of clearing portions of the C-band downlink spectrum in specific areas across the country . . . for coordinated terrestrial use,”¹⁹ is inherently limited by the fact that it only echoes the narrow interests of the parties that filed the comments.

¹⁸ *Broadcast Incentive Auction Report and Order* at ¶ 2.

¹⁹ Joint Comments of Intelsat License LLC and Intel Corporation, GN Docket No. 17-183 (“Intel-Intelsat Joint Comments”) at 2.

Although Speedcast agrees with some of the underlying assessments put forth in the Intel-Intelsat Joint Comments, the comments do not accurately reflect the regulatory and commercial interests or priorities of the satellite industry, but rather the limited perspectives of two companies. Moreover, Speedcast cannot accept any process whereby one or more self-appointed C-band satellite operators negotiates spectrum access arrangements on behalf of earth station operators and service providers without their input or consent.

A. The Intel-Intelsat Proposal Reflects a Limited Subset of Industry Viewpoints

The proposal in the Intel-Intelsat Joint Comments fails to account for the interests of a multitude of other C-band satellite operators, earth station operators, satellite service providers, and end-user customers, as well as the divergent interests of potential terrestrial new entrants. Although there is some commonality of positions between Intel and Intelsat and others in their respective industries, the companies are not appointed spokespersons and any mechanism for sharing adopted by the Commission should be rooted in policy that reflect the interest of the industry as a whole.

For example, Intel and Intelsat discount the imperative role that the full-band, full-arc licensing policy plays in the C-band satellite services landscape and, in many cases, “voluntarily cleared spectrum areas”²⁰ in portions of the C-band are infeasible due to customer obligations or operational necessity. While the Intel-Intelsat Joint Comments recognize the widespread use of the C-band and correctly state that “any introduction of terrestrial mobile services would need to take into account these long-established satellite services and consider the value of the deployed satellite assets and their associated lifetimes,”²¹ such an approach may create unrealistic

²⁰ *Id.* at 15.

²¹ *Id.* at 10-11.

expectations that incumbent satellite operators and new terrestrial users will be able to come to an amicable sharing arrangement.

More disturbing, the proposal suggests that “primarily affected C-band satellite operators” be tasked with negotiating on behalf of the entire satellite industry. Excluded from this definition are a large number of C-band earth station operators, service providers, and end user customers, as well as many C-band satellite operators that do not hold FCC satellite licenses with full CONUS coverage, all of whom have a direct and substantial interest in any spectrum access arrangement negotiated with terrestrial wireless interests. These additional industry participants, including Speedcast, must be included in the development of any C-band spectrum access arrangement submitted to the Commission for its consideration.

B. Speedcast Agrees that Principles of Economic Efficiency Dictate Compensation to Incumbent Licensees

Facilitating terrestrial use of C-band spectrum will require extensive transformation of existing satellite and earth station operations. As Intel-Intelsat states, “satellite operators would likely need to alter their existing space station operations to consolidate their spectrum use, maximize frequency reuse, and prevent disruption to FSS customers—a process that will require considerable planning and capital expenditure.”²² However, fully considering the complex and costly efforts that C-band earth station operators and service providers would have to undertake to free up portions of the band for terrestrial use must also be part of the process. In this connection, Speedcast agrees that appropriate economic incentives should exist for all C-band satellite industry participants to undertake the extensive efforts and ensure efficient and equitable compensation for costs incurred.

²² *Id.* at 16.

If new entrants have emerged that create superior public benefits or opportunities for economic growth, as has been suggested in this proceeding, then principles of economics dictate that the new entrants should compensate incumbents. Such compensation is a key market incentive to ensure “the highest and best use” of C-band spectrum in the short term.²³ Speedcast agrees that “any introduction of terrestrial mobile services would need to take into account [the] long-established satellite services and consider the value of the deployed satellite assets and their associated lifetimes,”²⁴ but this must specifically include the earth station facilities and satellite services businesses upon which services to end user customers are based.

The Commission should create a process under which new terrestrial broadband wireless entrants compensate incumbent C-band satellite industry participants for any costs they will incur, including: transponder lease and customer service contract termination costs, foregone customer revenues, migration to new spectrum or new locations, interference mitigation and equipment replacement costs, and migration to costly new technologies. Doing so would ensure that the decision to undertake the transition to terrestrial broadband services in this band is, in fact, economically efficient and will offer greater economic and public interest benefits by enabling the efficient and quick sharing of resources.

V. The Commission Should Consider the Recent BAC Petition in the Context of the Mid-Band NOI

Speedcast also suggests that the Commission dismiss the recently-filed Broadband Access Coalition (“BAC”) Petition²⁵ and instead consider the issues raised within the context of

²³ Intel-Intelsat Joint Comments at 17.

²⁴ *Id.* at 10-11.

²⁵ *See Petition for Rulemaking to Amend and Modernize Parts 25 and 101 of the Commission’s Rules to Authorize and Facilitate the Deployment of Licensed Point-to-Multipoint Fixed*

the broader issues to be studied in this Notice of Inquiry (“NOI.”) The NOI specifically asks whether the Commission should “allow for the deployment of point-to-multipoint [fixed service] broadband services” in the 3.7-4.2 GHz band.”²⁶ Accordingly, the NOI subsumes the key issues raised in the BAC Petition. Giving these issues separate consideration would require parties to make duplicative filings and would otherwise be an inefficient use of Commission resources.

In the NOI, the Commission is examining the frequencies in “spectrum bands between 3.7 GHz and 24 GHz (mid-band spectrum)” in order to explore “options to expand access opportunities in mid-band frequencies . . . for expanded flexible wireless broadband use.”²⁷ Moreover, the Commission is already undertaking a detailed analysis of the overall best uses for the 3700-4200 MHz band that is the subject of the BAC Petition, and there is no need for the Commission to look at issues related to the band in two separate proceedings. The NOI intrinsically includes the key issues raised in the BAC Petition and separate consideration would require duplicative filings and create an administrative burden on the applicants and the Commission. Thus, the Commission should pursue a more efficient rulemaking process by denying the BAC Petition and reviewing any potential changes to the existing licensing and coordination scheme in the 3700-4200 MHz band among the broader issues to be studied in the Notice of Inquiry on the use of mid-band spectrum between 3.7 and 24 GHz.

Wireless Broadband Service in the 3700-4200 MHz Band, RM-11791 (filed June 21, 2017) (“BAC Petition”).

²⁶ NOI ¶ 18.

²⁷ *Id.* ¶¶ 1-2.

VI. Conclusion

In conclusion, for the reasons set forth above, Speedcast agrees with commenters that the Commission must protect incumbent C-band operations from interference from new or expanded terrestrial broadband in the 3700-4200 MHz (space-to-Earth) and 5925-6425 MHz (Earth-to-space) bands as contemplated in the NOI. Speedcast requests that the Commission carefully consider the technical, operational, and commercial burdens that would be placed on existing C-band operations forced to share or reallocate critical spectrum resources.

Respectfully Submitted,

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