

**Before the  
Federal Communications Commission  
Washington, DC 20554**

In the Matter of	)	
	)	
Use of Spectrum Bands Above 24 GHz For	)	GN Docket No. 14-177
Mobile Radio Services	)	
	)	
Amendment of Parts 1, 22, 24, 27, 74, 60, 90, 95,	)	WT Docket No. 10-112
and 101 To Establish Uniform License Renewal,	)	
Discontinuance of Operation, and Geographic	)	
Partitioning and Spectrum Disaggregation Rules	)	
And Policies for Certain Wireless Radio Services	)	
To:    The Commission		

**COMMENTS OF  
OPEN TECHNOLOGY INSTITUTE AT NEW AMERICA**

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**COMMENTS OF  
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New America’s Open Technology Institute (“OTI”) hereby submits these Comments in response to the *Third Further Notice of Proposed Rulemaking* (“*Third FNPRM*”) in the above captioned proceeding.<sup>1</sup> OTI agrees with the Commission’s decision to dismiss the petitions for reconsideration and reaffirm that the 37-37.6 GHz band (“Lower 37 GHz band”) will be available on a coordinated shared licensed basis.<sup>2</sup> We believe the authorization of a third-party and ultimately automated coordination framework will facilitate the most intensive and cost-effective degree of shared access and “promote access to spectrum by a wide variety of entities, support innovative uses of the band, and help ensure that spectrum is widely utilized.”<sup>3</sup>

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<sup>1</sup> *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, Amendment of Parts 1, 22, 24, 27, 74, 60, 90, 95, and 101 To Establish Uniform License Renewal, Discontinuance of Operation, and Geographic Partitioning and Spectrum Disaggregation Rules And Policies for Certain Wireless Radio Services*, Third Further Notice of Proposed Rulemaking, GN Docket No. 14-177, WT Docket No. 10-112 (rel. June 8, 2018) (“*Third FNPRM*”).

<sup>2</sup> See *Id.* at ¶ 38.

<sup>3</sup> *Id.* at ¶ 112, quoting *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, Amendment of Parts 1, 22, 24, 27, 74, 60, 90, 95, and 101 To Establish Uniform License Renewal, Discontinuance of Operation, and Geographic Partitioning and Spectrum Disaggregation Rules And Policies for Certain*

## I. SUMMARY AND INTRODUCTION

Throughout the *Spectrum Frontiers* proceeding, beginning with comments in response to the 2014 *Notice of Inquiry*, OTI has strongly supported the framework adopted in the 2016 *Report & Order*, with shared access to the 37–37.6 GHz band authorized on a license-by-rule basis and available to both Federal and non-Federal users on a coordinated, co-equal basis.<sup>4</sup> We strongly agree with the Commission’s conclusion in the *Report & Order*, repeated in June’s *Memorandum Opinion & Order*, that “[a]llowing part of the band to be made available on a non-exclusive, shared basis will promote access to spectrum by a wide variety of entities, support innovative uses of the band, and help ensure that spectrum is widely utilized.”<sup>5</sup>

In response to this *Third FNPRM*, OTI emphasizes two primary positions:

First, OTI generally supports Starry’s proposal for “site-based registration through a third-party coordinator” (one or competing coordinators) that would conduct an interference analysis using the specific information provided by the proposed deployment and already-licensed deployments, as well as real-world GIS data, to coordinate permission to operate.<sup>6</sup> OTI believes that this approach, whether adopted under Part 101 or under Part 96, could enable almost immediate use of the band – even if the coordination is only semi-automated initially – while also paving the way for the development of a more efficient and low-cost automated frequency coordination mechanism going forward. Traditional Part 101 coordination is a relic, not a model for efficient spectrum sharing. It will not scale at low cost or in real time to handle the volume and complexity of fixed wireless coordination among the PtP, PtMP and other use

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*Wireless Radio Services*, Memorandum Opinion and Order, GN Docket No. 14-177, WT Docket No. 10-112 (rel. June 8, 2018), at ¶ 38.

<sup>4</sup> *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al.*, GN Docket No. 14-177, Report and Order and Further Notice of Proposed Rulemaking, FCC 16-89 (July 14, 2016) (“*Report & Order*”).

<sup>5</sup> *Id.*, at ¶ 112.

<sup>6</sup> *Id.* at ¶ 61.

localized use cases the Commission envisions for the band. A centralized coordination system delegated to one or more private sector operators would streamline the process, substantially lower the cost to operators, avoid the need to use FCC resources to review or approve applications, integrate federal users, improve transparency, and accommodate a virtually unlimited scale of localized deployments on the band. A streamlined version of Part 101 coordination can readily serve as the foundation (with modifications) for an initial coordination process in the Lower 37 GHz band, but this should evolve within a few years, ideally through consensus among industry stakeholders, into a fully automated and more dynamic frequency coordination system.

Second, OTI recommends that the Commission consider an additional use case for the band, facilitated by separately authorizing indoor-only use of the 37 to 37.6 GHz band on a General Authorized Access (GAA) or unlicensed (Part 15) basis. To facilitate more intensive, diverse and streamlined use of the band, the Commission should authorize a category of *indoor-only* operation on an unlicensed basis, or as GAA (particularly if device registration is necessary), under a framework similar to Part 96. Given the very limited propagation characteristics at 37 GHz, this would create an access option to the public that is truly open, uncomplicated and low cost, facilitating customized IoT, neutral host networks, and a variety of other uses indoors. Whether unlicensed, or licensed-by-rule (with a registration requirement), users would receive no interference protection.

## **II. The Commission Should Adopt a Shared Access Mechanism that is Streamlined and Evolves Rapidly into an Automated Frequency Coordination Database**

OTI fully agrees with the Commission’s stated goal in the *Third FNPRM*: To authorize a sharing mechanism that will “facilitate quick access to spectrum without unreasonable processing delays” and to “accommodate a variety of use cases that may develop for this band.”<sup>7</sup> Accordingly, we generally support Starry’s proposal for “site-based registration through a third-party coordinator” (one or competing coordinators) that would conduct an interference analysis using the specific information provided by the proposed deployment and already-licensed deployments, as well as real-world GIS data, to coordinate permission to operate.<sup>8</sup> OTI believes that this approach, whether adopted under Part 101 or under Part 96, could allow immediate use of the band – even if the coordination is only semi-automated initially – while also paving the way for the development of a more efficient and low-cost automated frequency coordination mechanism going forward.

The Broadband Access Coalition (“BAC”) has made a similar proposal to use the Part 101 frequency coordination process to allow for the immediate deployment of point-to-multipoint (PtMP) operations in the 3700-4200 MHz band while, at the same time, developing an automated frequency coordination system administered by one or more operators approved by the FCC through a process of stakeholder collaboration.<sup>9</sup> (OTI is a founding member of BAC.) Since deployment scenarios anticipated for the 37-37.6 GHz band are primarily fixed or very localized (small cell), a streamlined version of Part 101 coordination can readily serve as the foundation (with modifications) for an initial coordination process in the Lower 37 GHz band

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<sup>7</sup> *Third FNPRM* at ¶ 62-63.

<sup>8</sup> *Id.* at ¶ 61.

<sup>9</sup> See Broadband Access Coalition, Petition for Rulemaking (filed June 21, 2017), at 34-35. The Commission has invited comment on this proposal. See *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*, Order and Notice of Proposed Rulemaking, GN Docket No. 18-122, FCC 18-91 (rel. July 13, 2018), at 41.

that evolves within a few years into a fully automated and more dynamic frequency coordination system.

We expect that like the semi-automated coordination of point-to-point links at 70/80/90 GHz,<sup>10</sup> and the fully automated Spectrum Access System that will soon coordinate a more complex degree of sharing at 3550-3700 MHz, the coordination of sharing among users seeking SALs at 37-37.6 GHz can most rapidly, accurately and cost-effectively be done by one or more certified database managers that collect and manage all of the user and GIS data necessary to calculate coexistence. A centralized coordination system delegated to one or more private sector operators would streamline the process, substantially lower the cost to operators, avoid the need to use FCC resources to review or approve applications, integrate federal users, improve transparency, and accommodate a virtually unlimited scale of localized deployments on the band.

Whether the coordination process for SALs is situated under Part 101, Part 96, or a new subpart of the Commission's rules, OTI urges the Commission to avoid locking in the costly, cumbersome and unnecessary process that characterizes the Part 101 rules for Fixed Service, point-to-point links. While that could be desirable as a short-term expedient, aimed at allowing immediate coordination into the band, the Commission should explicitly embrace the goal of an integrated and automated frequency coordination system operated by third parties under Commission oversight, similar to coordinated sharing in CBRS and/or the 70/80/90 GHz bands.

Traditional Part 101 coordination is a relic, not a model for efficient spectrum sharing. It will not scale at low cost or in real time to handle the volume and complexity of fixed wireless coordination among the PtP, PtMP and other use localized use cases the Commission envisions

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<sup>10</sup> In 2016 the agency approved a third competing database manager, Key Bridge Global LLC, to coordinate the registration of point-to-point links in the 70/80/90 GHz bands, including with federal users through an interface with a database of federal use of the band. FCC, "Order and Notice to Database Managers for the 70/80/90 GHz Link Registration System Under Subpart Q of Part 101," Wireless Telecommunications Bureau, WT Docket No. 13-291 (rel. Aug. 26, 2016).

for the band. Part 101 of the Commission's rules require an operator to complete a coordination analysis prior to filing an application for authorization.<sup>11</sup> "The applicant must, through appropriate analysis, select operating characteristics to avoid interference in excess of permissible levels to other spectrum users."<sup>12</sup> For each link, an operator typically contracts with a private firm to prepare the coordination analysis, which must be sent to other registered users in the area (who have 30 days to raise objections). Only then can the user file an application for authorization with the Commission, specifying the latitude and longitude of the transmitter to be used. Although larger firms such as Comsearch – which coordinates over 10,000 links each year – now use their own proprietary database to largely automate the process, the cost and coordination time per link remains substantial.<sup>13</sup>

The traditional Part 101 coordination process is also not dynamic, which is understandable considering that it was designed to coordinate among very fixed and static deployments – most commonly fixed PtP microwave links and FSS earth stations that rarely change their operating parameters. In contrast, the most likely non-Federal deployments anticipated for this band would gain greater access to bandwidth – and use the band more efficiently – if the coordination mechanism is capable of adjusting dynamically rather than deterring flexibility by requiring a repeat of the expensive process outlined above (which is currently required for modifications). For example, an ISP deploying high-capacity PtMP

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<sup>11</sup> 47 C.F.R. § 101.103. The administrative aspects of the coordination process are set forth in Section 101.103(d), in the case of coordination of terrestrial stations with earth stations, and in Section 25.203, in the case of coordination of earth stations with terrestrial stations.

<sup>12</sup> See U.S. Federal Register, *Fixed Satellite Service and Terrestrial System in the Ku-Band*, Summary, First Report & Order, ET Docket No. 98-206 (rel. Dec. 8, 2000), available at <https://www.federalregister.gov/documents/2001/02/16/01-3710/fixed-satellite-service-and-terrestrial-system-in-the-ku-band>.

<sup>13</sup> See, e.g., "Comsearch Microwave: Expert Coordination Prevents Harmful Interference," available at <https://www.comsearch.com/services/frequency-coordination-fcc-licensing/microwave/>.



broadband in a rural hamlet or an exurban neighborhood may provide better service at lower cost – and avoid reserving more spectrum than needed – if the ISP’s authorization can adjust readily to changes in the location of access points, power levels, sectorization, antenna heights, etc. The same would be true for a mobile carrier seeking to add this band to access points in a targeted high-traffic area. These are dynamic operations that would be best served with a more flexible, fast, granular and responsive online coordination system.

An automated, third-party coordination system is also better able to integrate and protect Federal operations that need the ability to expand or change technologies over time. The most specific record support for shared, coordinated access to the 37–37.6 GHz band came from NTIA, which filed a detailed *ex parte* letter in 2016 stating the agency “supports a flexible and innovative sharing framework in the 37-38.6 GHz band.”<sup>14</sup> NTIA explained that current NASA operations, as well as planned deployments at 14 military facilities, will require ongoing and flexible use of the lower band segment. NTIA stated: “Federal and non-federal users would access the band through a coordination mechanism, **including exploration of potential dynamic sharing mechanisms** in the lower 600 megahertz that can be developed through a federal and industry collaborative process.”<sup>15</sup> An automated coordination system is also best able to enforce any prioritization for Federal operations that the Commission adopts now or in the future.

The Commission also seeks comment on “how to prevent ‘warehousing’,” including whether to “put limits on the aggregate area, or amount of spectrum, that any one licensee or its affiliates can protect.”<sup>16</sup> As the Broadband Access Coalition proposes for coordinated access to vacant frequencies in the downlink C-band at 3700-4200 MHz, the best way to preempt

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<sup>14</sup> *Ex Parte* Presentation of NTIA, GN Docket No. 14-177, et al. (July 12, 2016), at 1.

<sup>15</sup> *Id.* at 4 (emphasis added).

<sup>16</sup> *Third FNPRM* at ¶ 67.

warehousing, spur a race to deploy, and encourage competing operators in an area is to require coordinated sites to be put in service within a relatively short period, as Starry has proposed.<sup>17</sup>

Accordingly, SAL operators should be limited to coordinating (reserving) no more than 200 megahertz initially at each coordinated site, a reservation that expires after a relatively short deployment period (e.g., 60 to 120 days). Only when the operator has completed build-out on the initial 100 or 200 megahertz can it reserve and coordinate the next increment of up to 200 megahertz. If the Commission is concerned that even a band-wide operability requirement will not reserve sufficient spectrum in an area (e.g., urban core) for one service or the other, the FCC can adopt a condition limiting the overall share of the band that can be coordinated or retained if a conflicting coordination application is filed (e.g., 400 megahertz). Any deployments above this threshold could be granted secondary (GAA) status – and subject to a later directive from the coordination database that it move or reduce its reservation. These percentages (as well as allowable power limits) could also vary depending on the population density of the location.

Regardless of the precise nature of the geolocation database used to manage assignments on the 37 – 37.6 GHz band, we urge the Commission to adopt a standardized engineering metric to calculate the protection contour for a SAL, just as the Commission did to facilitate GAA to unused Priority Access spectrum in the CBRS *Second Report and Order*.<sup>18</sup> It would be most objective and efficient for the SAS to calculate the protection contour based on the location, power, height and other information the device would report upon registration. To the extent SAL licensees are permitted to report their coverage area, the protection contour should be subject to an objective maximum enforced by the SAS.<sup>19</sup>

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<sup>17</sup> *Id.* at ¶ 61.

<sup>18</sup> *Order on Reconsideration and Second Report and Order*, GN Docket No. 12-354 (rel. May 2, 2016).

<sup>19</sup> *Id.* at ¶ 174.

In sum, an automated frequency coordination mechanism, certified by the Commission and operated by one or more third parties, would have the capability to coordinate the greatest degree of spectrum sharing by a wide variety of users with varying needs for interference protection. Due to the propagation characteristics of the band, the coverage area of a registered device will be very small. Manual coordination through an agency portal will not scale to handle the sheer quantity of authorizations. Nor could it handle the potential for multiple and overlapping SALs in an area, combinations that could change frequently given the benefits of flexibility for PtMP, single base station IoT, small cell mobile and other operations.

### **III. The Commission Should Authorize General Authorized Access for Indoor-Only Operation at any Location and with No Coordination Requirement**

In the *Third FNPRM* the Commission anticipates “at least four types of non-Federal deployments in the Lower 37-37.6 GHz Band”:<sup>20</sup>

- point-to-point links (for example backhaul and backbone links);
- fixed wireless broadband systems (generally consisting of a fixed access point and fixed subscriber units);
- single base station IoT-type systems (for example, in a factory); and
- carrier-based deployments of mobile systems using the Lower 37 GHz Band as supplemental capacity

OTI recommends that the Commission consider an additional use case for the band, facilitated by separately authorizing indoor-only use of the 37 to 37.6 GHz band on a General Authorized Access (GAA) or unlicensed (Part 15) basis.

To facilitate more intensive, diverse and streamlined use of the band, the Commission should authorize a category of *indoor-only* operation on an unlicensed basis or as General Authorized Access under a framework similar to Part 96. Given the propagation characteristics at

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<sup>20</sup> *Third FNPRM* at ¶ 61.

37 GHz, this would create an access option to the public that is truly open, uncomplicated and low cost, facilitating customized IoT, neutral host networks, and a variety of other uses indoors. Whether unlicensed, or licensed-by-rule (with a registration requirement), users would receive no interference protection. The guaranteed availability of General Authorized Access inside every building for indoor-only use would ensure that every venue (including every Federal building) has access to and control over 600 megahertz of mmW bandwidth that can enable a diverse variety of needs and new innovations. This will encourage more spectrum re-use and intensive use of the band.

Considering the very limited propagation of spectrum above 37 GHz, the power levels and other technical rules for indoor-only use can almost certainly ensure that the types of deployment in the band – which are likely to be directional and higher power – will be shielded from lower-power, indoor use by single base station IoT and similar uses. Based on testing, power levels and other technical rules can be specified to minimize that risk.

There would be upside but no downside for Shared Access Licensees. ISPs that have coordinated an area for outdoor use have no reasonable expectation of operating inside third-party facilities without permission. Conversely, since *any* indoor access point will ultimately require the permission of the property holder, it is most efficient to allow ISPs and other providers to access 37-37.6 GHz spectrum inside homes, offices, and other facilities on a GAA or unlicensed basis. This obviates the need for special negotiations or payments to property owners (e.g., apartment buildings or condo associations) in relation to indoor extensions of outdoor networks. Ultimately, whoever controls the venue can control the access points or other equipment operating inside its walls, and so enterprises can still realize the benefits the Commission intended.

We are aware that the Commission declined to adopt the proposal in the *First NPRM* to authorize unlicensed indoor-only operations across the entire 37 GHz band because there is no testing to show that “signal leakage through windows” could not adversely impact the operations of UMFUS licensees, many of which require exclusive rights to ensure quality of service. However, if a GAA assignment for indoor-only use is limited to the lower 37 – 37.6 GHz band segment the trade-off is very different. The Lower 37 GHz is not likely to be the quality-of-service platform for a wide-area UMFUS network serving handsets that need to a weak signal at the edge of cellular coverage area. And although the Commission has proposed a measure of interference protection to SALs on a first-in basis – relying on protection contours managed through a frequency coordination process – this may not be necessary with respect to indoor devices separated by at least one wall from neighboring deployments.

If needed, the Commission can adopt additional protections to minimize the risk that “signal leakage” from indoor-only use of the 37 – 37.6 GHz band will disrupt neighboring deployments. First, the Commission can adjust the technical rules for GAA operations to preclude the power levels and/or directional antennas that make signal leakage significant enough to create risks of disruption to neighboring SAL operations. Second, as the *First FNPRM* observed, the Commission can “require that these devices be AC-powered in order to ensure that they only operate indoors.”<sup>21</sup> Third, indoor GAA users can be required to register their location, and/or periodically renew their permission to operate through the automated coordination mechanism. Similar to the Part 96 framework, if a SAL operator experiences harmful interference it can be more readily identified and resolved, including by denying permission for any continued GAA operation within the protection contour associated with the impacted SAL.

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<sup>21</sup> *First FNPRM* at ¶ 440. This AC-power requirement already applies to unlicensed operations at 90 GHz.

#### IV. CONCLUSION

OTI applauds the Commission for moving expeditiously to define SALs and to establish a coordinated sharing mechanism that can facilitate the greatest possible degree of access and use for a diverse range of users and use cases. We urge the Commission to initially authorize a simplified and streamlined coordination process that allows early use of the band, while simultaneously embracing a multi-stakeholder process to develop consensus on an automated frequency coordination process that can speed access, lower costs, accommodate Federal users, and manage more intensive and flexible access to the band. We also urge the Commission to authorize indoor-only use of the band on an unlicensed or GAA (registered) basis, which will further encourage intensive re-use of the band and enable industrial IoT, neutral host networks and other innovations in the public interest.

Respectfully submitted,

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