

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

In the Matter of)	
)	
Higher Ground LLC)	File No. SES-LIC-20150616-00357
)	
Application for a Blanket License to)	Call Sign E150095
Operate C-band Mobile Earth Terminals)	

**REPLY OF THE FIXED WIRELESS COMMUNICATIONS COALITION
TO THE CONSOLIDATED OPPOSITION TO APPLICATIONS FOR REVIEW
OF HIGHER GROUND LLC**

Pursuant to Section 1.115(d) of the Commission’s rules, the Fixed Wireless Communications Coalition, Inc. (FWCC) replies to the Consolidated Opposition to Applications for Review filed by Higher Ground LLC (HG) on March 6, 2017 (Opposition).

The challenged *Order* grants HG a waiver to deploy up to 50,000 mobile satellite earth stations—“SatPaqs”—transmitting in the 5925-6425 MHz band. These frequencies are shared on a co-primary basis with the Fixed Service (FS), which operates approximately 58,000 point-to-point microwave links in the band. Some of these carry communications that are critical to safety of life and property.

A waiver must accomplish the purpose of the rules it waives.¹ The purpose of the rules waived here is to protect the FS from harmful interference. As the proponent, HG has the burden of proof.²

The *only* evidence in the record that HG’s system will prevent interference comes in HG’s own statements, and those same statements as repeated in the *Order* and by Virginia Tech

¹ *WAIT Radio v. FCC*, 418 F.2d 1153, 1157 (D.C. Cir 1969).

² HG incorrectly suggests otherwise: “The Petitioners offer up little in support of their claims that Higher Ground will interfere with C-band FS stations.” Higher Ground Opposition at 4. This is backwards. HG has the burden of proving it will *not* cause interference.

Professor Jeffrey H. Reed, with no independent verification. HG describes at length its principles for choosing non-interfering frequencies, but these are merely design criteria: goals for the technology. Nothing in the record shows that HG has achieved them.

No one has ever done what HG promises: unilateral coordination of mobile transmitters among fixed receivers. The stakes here warrant the Commission's asking for more in the way of assurance than a further repetition of HG's own claims.

HG misquotes the FWCC as agreeing its operations will have negligible interference effects. (Opposition at 6.) We agree the interference threat *should be* negligible if HG's coordination methods were successful.³ The success of those methods is the point in dispute.

HG claims to have conducted multiple "demonstrations" showing how its software identifies non-interfering frequencies. The one open to us was a staged presentation that offered no way to tell whether the software did what it was supposed to.

At the presentation, HG conceded it would not protect the FS against adjacent channel interference, even though frequency coordinators routinely take that into account. We explained that HG's later response—a promise to comply with out-of-band emissions limits—has no bearing on this problem. Now HG argues instead that low signal strength and small likelihood of proximity to an FS station result in minimal risk of interference. This language comes from the *Order*; but with no explanation, analysis, or other reason to think it is factually correct.

³ We said: "Higher Ground's stated aim is to limit interference caused by its transmitters to 6 dB below the thermal noise power level of affected fixed service receivers. *If Higher Ground's coordination methods are successful in achieving this goal*, we agree the interference effects should be negligible." Letter from Cheng-yi Liu and Mitchell Lazarus, Counsel to FWCC, to Marlene H. Dortch, FCC, at 6 (June 8, 2016) (emphasis added) (citation footnote omitted).

UTC's Application for Review properly raised concerns about reflections in the environment. HG responded that the SatPaq transmitters use directional antennas pointed toward the satellite "overhead," not toward the ground where reflections can occur. This is wrong several ways. Geosynchronous satellites are never "overhead" in the United States. In northern regions they are low in the sky. The SatPaq antennas' low directionality and wide patterns will direct energy toward the ground despite being aimed at the satellite.

Even if HG were to fix these particular problems, its responses show it does not understand the principles of frequency coordination, creating a risk of badly designed algorithms that will cause interference to the FS.

HG could resolve that concern with public testing. It baffles us that HG would offer—and the Bureaus would approve—a potentially interfering system involving tens of thousands of transmitters that rely on a novel, untried technology in a band that carries critical communications, without a comprehensive, public field test. Although HG claims to have tested its system, it disclosed neither the conditions of the test nor the results. The Commission should find this unacceptable.

HG relies on a claim that its own internal testing produced no interference complaints. Even if HG in fact had caused extensive interference, it still would have received no complaints. FS operators experiencing the interference would have had no way to suspect HG as the cause.

HG dismisses our citing public tests of the TV white space coordination system by saying its system is far simpler and manages a limited number of devices within the same network. HG's 50,000 devices is hardly a "limited number." The TV white space system tracks just 7,157 TV stations—one-eighth the number of fixed links HG must protect; and the TV stations have

simpler antenna patterns.⁴ A two-second interruption to TV service is annoying but not serious; a two-second interruption to a public safety FS backhaul link can shut down first responders' radios for fifteen minutes, leaving them deaf to 911 calls. If the TV white space system needed public testing under realistic conditions, the HG system certainly does.

HG continues to insist that an FS operator experiencing interruption can approach Higher Ground and seek information from its log. This would increase the FS operator's workload solely to accommodate HG, and only because HG has not shown ahead of time that it will protect the FS. Even if HG's reporting mechanism found its system did cause interference, it cannot prevent further interference in the future, as would arise from faulty coordination algorithms.

We argued from the start that a novel, widely-deployed, mobile technology having the potential to cause interference should have been evaluated through a rulemaking. HG's offer of closed meetings to a small subset of interested parties is no substitute. Of the two precedents that HG cites for authorization by waiver, one concerned a single earth station (not 50,000) operating under conditions similar to those proposed in a then-pending rulemaking; the other allowed operation on ships at sea—but only more than 100 km from land, unless the licensee had successfully completed conventional frequency coordination with all existing fixed service stations along its particular route.⁵ HG's waiver, which authorized tens of thousands of mobile devices using an untested coordination technology, is completely unprecedented.

⁴ Computed from *Broadcast Station Totals as of December 31, 2016* (released Jan. 5, 2017) (no release number). TV white space devices also protect other facilities in much smaller numbers.

⁵ *L-3 Communications Titan Corp.*, 24 FCC Rcd 3047, ¶¶ 26, 6 (IB & OET 2009); *Crescomm Transmission Services*, 11 FCC Rcd 10944, ¶ 11 (IB & OET 1996).

The International Bureau buried the only public notice of HG's waiver request in a weekly listing of satellite applications. One applicant for review having a major interest in the outcome—a sophisticated party that appears often before the Commission— reports having been unaware of the proceeding until release of the *Order*.⁶ Although HG claims the Bureaus also published a notice in the Federal Register (Opposition at 18 n.66), we cannot find that notice.

HG failed to satisfy the minimum requirements for a waiver. The Commission should reverse the Order, revoke the waiver, and rescind the authorization. In the alternative, the Commission can set aside the waiver grant, return Higher Ground's application to pending status, and open a rulemaking that includes public testing of Higher Ground's system.

Respectfully submitted,



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⁶ Application for Review of APCO International at 2 (filed Feb. 17, 2017).

CERTIFICATE OF SERVICE

I, Deborah N. Lunt, a secretary with the law firm of Fletcher, Heald & Hildreth, PLC, hereby state that true copies of the foregoing **REPLY OF THE FIXED WIRELESS COMMUNICATIONS COALITION** were sent by first class mail, postage prepaid, March 21, 2017, to the following service list.

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