



September 21, 2021

**VIA ECFS**

Ms. Marlene H. Dortch  
Secretary  
Federal Communications Commission  
45 L Street, NE  
Washington, DC 20554

**Re: Notice of *Ex Parte* Presentation**  
***Expanding Flexible Use of the 12.2-12.7 GHz Band, WT Docket No. 20-443***

Dear Ms. Dortch:

In a September 17, 2021 meeting with FCC staff, representatives for RS Access, LLC (RS Access) discussed the feasibility and benefits of authorizing 5G mobile broadband services in the 12.2-12.7 GHz band.<sup>1</sup> RS Access reviewed the history of this proceeding and noted that it has sought to be scrupulously responsive to the question presented by the Commission at the outset: whether and how this unique spectrum resource could be reformed for the benefit of hundreds of millions of American consumers. RS Access is the only party to have submitted to the Commission detailed engineering and econometric studies demonstrating that satellite and terrestrial 5G services can coexist while unleashing tremendous social value. Opponents of reform, led by SpaceX, have provided no science-based analysis or rebuttal of their own; they have instead offered rhetoric and misrepresentation that distract from the serious policymaking issues before the Commission. During the meeting, representatives of RS Access referred to the attached slides reviewing the state of the evidence on the record in favor of reform.<sup>2</sup> RS Access urged the Commission to unlock the 12 GHz band for 5G investment by updating the archaic, decades-old rules currently constraining terrestrial license holders.

Please contact me with any questions regarding this submission.

Respectfully submitted,

/s/ V. Noah Campbell

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<sup>1</sup> A list of meeting attendees is attached. *See* Attachment A.

<sup>2</sup> *See* Attachment B.

V. Noah Campbell  
CEO  
RS Access, LLC  
645 5th Ave, 10th Floor  
New York, NY 10022

Attachments

## Attachment A

### September 17, 2021 Meeting Participants

#### Wireless Telecommunications Bureau

Blaise Scinto  
Peter Daronco  
Tim Hilfiger  
Janet Young  
Madelaine Maior  
Simon Banyai  
Anthony Patrone  
John Miles

#### International Bureau

Jennifer Gilsenan  
Jameyenne Fuller  
Merissa Velez

#### RS Access, LLC

V. Noah Campbell  
Michael Gerstner  
Daniel Shuchman  
Trey Hanbury  
Tom Peters

**Attachment B**

**Presentation of RS Access, LLC**

# Bringing 5G to the 12 GHz Band

*Accelerating Next-Generation Broadband Deployment with  
500 MHz of Mid-Band Spectrum at 12.2-12.7 GHz*

WT Docket No. 20-443

September 17, 2021

# Summary: Seizing the 5G Opportunity

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- **Strong Record of Support:** Commenters across industries support updating 12 GHz rules to support 5G mobile services
- **NGSO Coexistence:** RKF Engineering finds minimal, if any, likelihood of harmful interference to potential NGSO users. This study remains unrebutted
- **DBS Coexistence:** The Peters Study found minimal, if any likelihood to of interference to DBS. That likelihood has gone down since 2016.
- **Economic Upside:** Brattle finds 5G could generate \$54 billion in value and create more than a trillion dollars in benefits for society at large
- **Huge Technical Advantages:** Roberson & Associates finds that the 12 GHz band is a goldilocks band combining the best of C-band and mmW in key areas: capacity, coverage, path loss, and equipment development
- **Balancing Interests:** The record shows massive potential upside in updating 12 GHz rules with minimal tradeoffs; the policy choice is clear

# The Record Reflects Widespread Support for 5G in 12 GHz



**Increased Competition:** Flexible use of the 12 GHz band “will help maximize the number of potential 5G broadband providers, particularly in rural areas, and increase competitive broadband offerings, which in turn will benefit consumers by improving access, affordability and quality of service.” – Public Knowledge



**Supporting US 5G Leadership:** “Leveraging the Commission’s flexible use policies for the 12 GHz band will enhance U.S. leadership in 5G and strengthen key economic and national security interests.” – Incompas and CCA



**Carrier Support for Updated Rules:** “Commenters resoundingly agree that more spectrum is needed to support terrestrial 5G services and that the 12 GHz band may be an ideal target.” – T-Mobile



**Supporting Fixed and Mobile Applications:** “Federated Wireless strongly supports the Commission’s efforts to expand use of the 12 GHz Band for new terrestrial broadband services, including fixed and mobile 5G wireless services.” – Federated Wireless



**A Unique Opportunity to Act:** The 12 GHz band presents “a unique opportunity to propel the U.S. to undisputed leadership in the race to 5G.” – DISH Network



# 5G Opponents: All Rhetoric, No Evidence

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- No technical study disproving feasibility of NGS0/5G coexistence: RS Access is the only party to submit technical, scientific research into the record
- No technical study disproving feasibility of DBS/5G coexistence: The Peters Study has not been rebutted
- No technical study disputing the 12 GHz band's suitability for 5G: The Roberson Report, as well as several wireless carriers, identify the 12 GHz band as a natural band to support mobile 5G services
- No economic analysis examining negative impacts of updating antiquated restrictions on the 12 GHz: The Brattle Group study shows substantial consumer benefits in removing unnecessary restrictions



# 5G and NGSO FSS Can Readily Coexist

## *RKF Engineering's Study*

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- Monte Carlo simulation of exceedance to potential NGSO using highly detailed model 5G network
- Assumes statistically significant sample of: (1) roughly 50,000 5G base stations, 90,000 5G small cell base stations, 1.9 million 5G devices, and 7,000 P2P links; and (2) 2.5 million Starlink terminals\*
- Assumes ubiquitous deployment of 5G and Starlink terminals in both rural and urban areas
- Finds 0.888% of Starlink terminals could experience an event that exceeds a nominal ITU threshold of -8.5 dB
  - This number is a **VERY** small likelihood of exceedance
  - This number does **NOT** account for normal coordination measures that can reduce exceedance events
  - Exceedance does **NOT** imply “harmful interference”

\*As of 9/17/2021 Starlink is only authorized for 1M terminals in the US

Assessment of Feasibility of Coexistence between  
NGSO FSS Earth Stations and 5G Operations  
in the 12.2 – 12.7 GHz Band  
May 2021

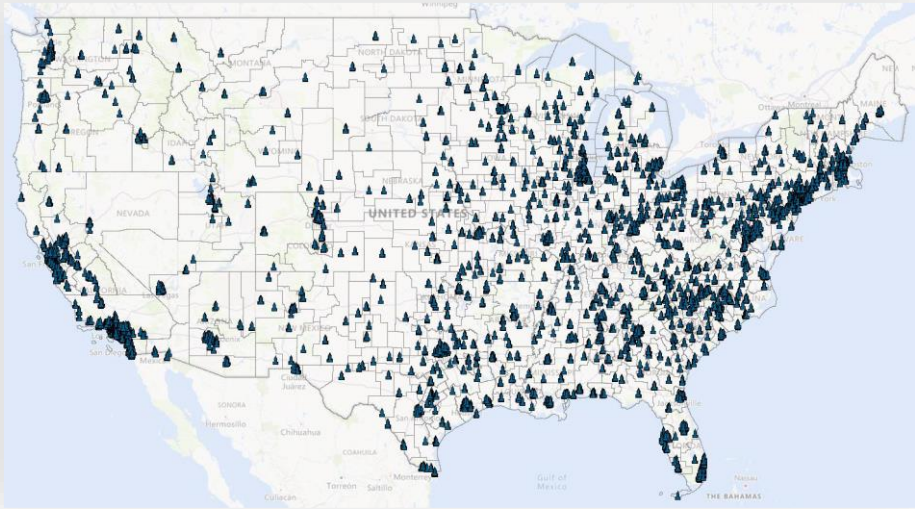
Prepared by:

RKF Engineering Solutions, LLC  
7500 Old Georgetown Road  
Bethesda, MD 20814



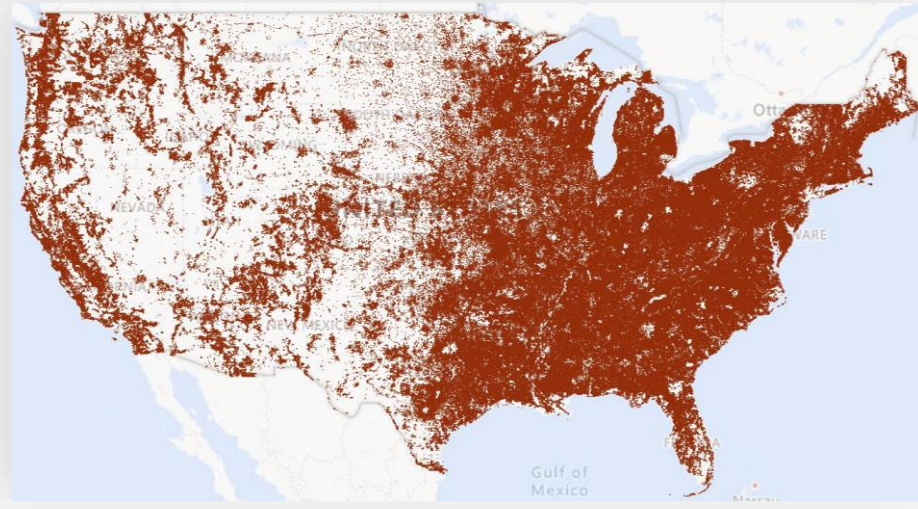
# SpaceX Misrepresents the RKF Study

Falsely claims RKF “assumes a 12 GHz 5G buildout will occur only in urban areas”



RKF’s Distribution of 49,997 12 GHz Macro-Cell Base Stations over CONUS (consistent with current US wireless networks)

Wrongly criticizes RKF for assuming, consistent with all evidence and SpaceX’s own statements, that Starlink would focus on less densely populated areas



RKF’s Distribution of 2.5M Starlink Terminals throughout CONUS

# DBS Coexistence—Getting Easier by the Day

## *Tom Peters' DBS Coexistence Studies*

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### DBS Gets Every Benefit of the Doubt

- Assumes three configurations: point-to-point, outdoor small cell, and indoor small cell
- Worst-case analysis—assumes all DBS dishes will receive all video channels across the entire 12 GHz and all operational DBS slots, 24/7
- Snapshot analysis instead of Monte Carlo—overestimates likelihood interference
- Over-sites the location of DBS terminals: 1 dish/m<sup>2</sup> in urban; 2 dishes/m<sup>2</sup> in rural
- No horizon nulling

### Changes Since the Peters Studies

- Fewer DBS subscribers
- Massive MIMO
- Adaptive beam steering and beam forming
- Aggregation of 3+ carriers
- Device technology advancements
- Optimized power consumption
- Network virtualization
- Network densification
- Open RAN

# 12 GHz: Ideal for Mobile 5G Services

## *Roberson and Associates' Technical Survey*

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- 12 GHz exhibits 440 to 950% better free-space path loss than mmW bands
- 12 GHz can support aggregate downlink throughput of 20.0 Gbps. Compare C-band (15.1 Gbps) and 28 GHz band (9.0 Gbps)
- 12 GHz requires 6% to 20% the number of base stations compared to mmW
- 12 GHz equipment can be rapidly produced based on existing mid-band technology and global standards-setting

Band (GHz)	Aggregated Bandwidth (MHz)	SU-MIMO Layers	Spectral Efficiency (bps/Hz)	Per-User Peak Throughput (Gbps)
3.7	200	4	22.3	3.1
12	200	4	17.2	2.4
28	200	2	9.0	1.5
12	500	4	17.2	6.0
28	800	2	9.0	5.0

# Trillion-Dollar Upside

## The Brattle Group's Economic Study

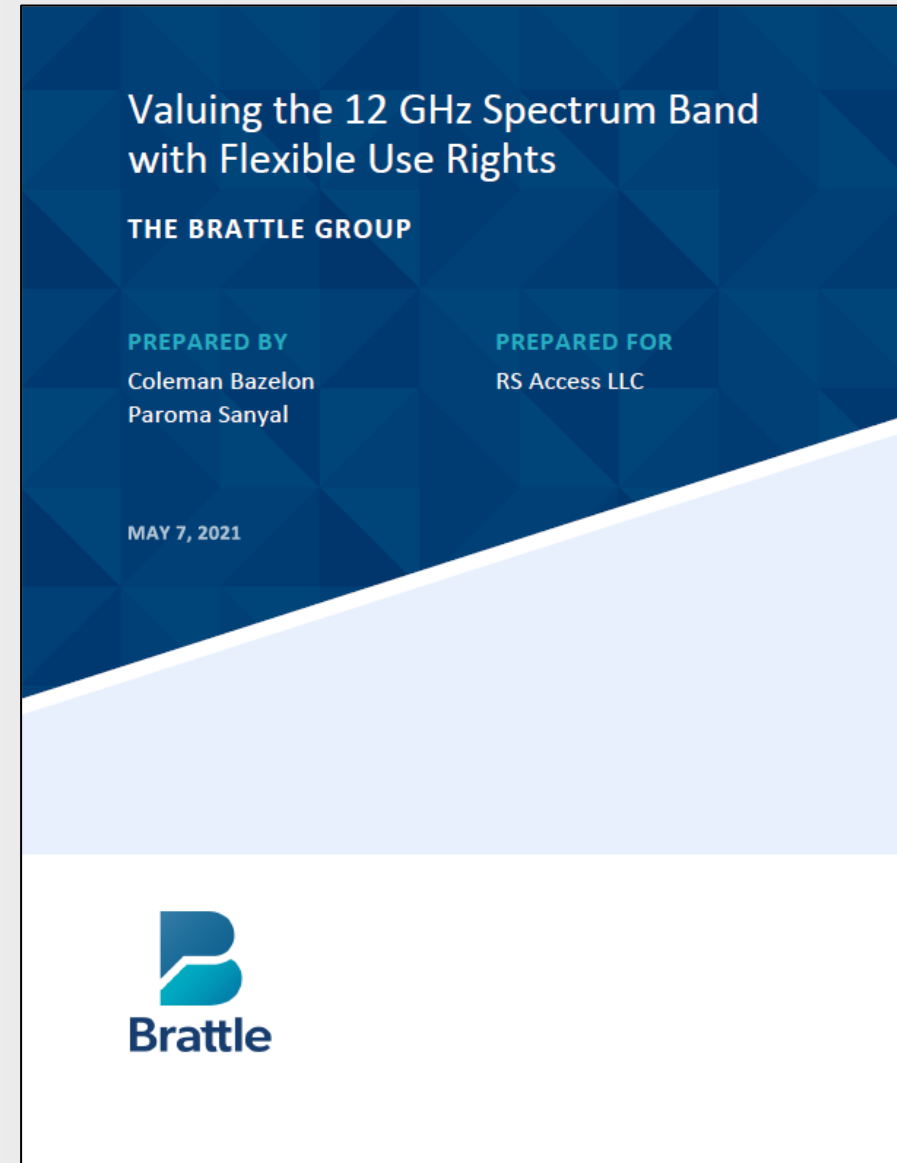
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- **Analysis of Three Scenarios:**
  1. Status quo—underused band with no 5G
  2. 5G sharing without interference
  3. 5G sharing with limited interference
- **Comparables Analysis**

C-band as starting point; adjusted downwards for propagation differences
- **Incremental value of allowing 5G in 12 GHz:**

\$27.1 - \$54.1 billion
- **Incremental total societal benefits:**

\$270 billion - \$1,082 billion



# RS Access: Responsive to the NPRM

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**The Commission asked “interested parties to address whether additional operations can be accommodated in the band while protecting incumbent operations.”**

- The technical record is unrebutted: it is feasible to update rules in the band while protecting incumbent operations.

**The Commission asked “whether a balancing of public interest benefits would support...expanded spectrum rights in the 12 GHz band.”**

- As RKF Engineering has definitively shown, any potential interference with future, hypothetical NGSO subscribers would be highly *de minimis*.
- As the Commission weighs the public interest, the societal benefit identified by The Brattle Group of enabling 5G in 12 GHz is all upside.
- This meets the Commission’s goal of “leading to greater benefits to consumers” in support of the public interest.

**The record is clear and there is no reason to delay.** Adding 500 MHz of contiguous mid-band spectrum to the US 5G pipeline will lead to massive consumer benefits, which The Brattle Group estimates could exceed \$1T, while protecting incumbent services from harmful interference.