

March 14, 2019

**VIA ECFS**

Ms. Marlene H. Dortch  
Secretary  
Federal Communications Commission  
445 12th Street, SW  
Washington, DC 20554

**Re: Notice of Ex Parte Presentation**

**GN Docket No. 18-122**, *Expanding Flexible Use of the 3.7 to 4.2 GHz Band*

**GN Docket No. 17-258**, *Promoting Investment in the 3550-3700 MHz Band*

**RM-11791**, *Petition for Rulemaking to Amend and Modernize Parts 25 and 101 of the Commission's Rule to Authorize and Facilitate the Deployment of Licensed Point-to-Multipoint Fixed Wireless Broadband Service in the 3.7-4.2 GHz Band*

**RM-11778**, *Fixed Wireless Communications Coalition, Inc., Request for Modified Coordination Procedures in Band Shared Between the Fixed Service and the Fixed Satellite Service*

**WT Docket No. 18-197**, *Applications of T-Mobile US, Inc., and Sprint Corporation for Consent to Transfer Control of Licenses and Authorizations*

Dear Ms. Dortch:

On March 12, 2019, Craig Cowden, head of wireless technologies for Charter Communications, Inc. ("Charter"), Colleen King, also of Charter, and the undersigned met with Nicholas Degani and Rachael Bender, advisors to Chairman Pai; Commissioner Michael O'Rielly and his advisor Erin McGrath; Commissioner Brendan Carr and his advisor Will Adams; Umair Javed, advisor to Commissioner Rosenworcel; William Davenport, advisor to Commissioner Starks; and Donald Stockdale, Dana Shaffer, Joel Taubenblatt, and Matthew Pearl of the Wireless Telecommunications Bureau regarding the above-captioned matters.

At the meetings, we discussed the company's Spectrum Mobile product and our potential plans for next steps. These potential plans are illustrated in the attached deck, which we walked through with the FCC meeting participants. We explained that Charter is working to combine its advanced wireline network with innovative wireless technologies to deliver the next generation of broadband to customers across the country—regardless of whether they are inside their homes and offices, or outside on the go. We also discussed the importance of mid-band spectrum,

including the 3.7-4.2 GHz band (or C-Band), for 5G mobility and fixed wireless, especially for rural broadband deployments.<sup>1</sup> For these reasons, we explained that Charter supports maximizing the amount of spectrum available for 5G through open and transparent processes.

In addition, we were asked about limitations to our existing MVNO agreement. We explained that we are under an NDA and directed them to our response to the FCC's request for information in the pending Sprint/T-Mobile transaction proceeding.

Please direct any questions regarding the foregoing to the undersigned.

Respectfully submitted,

/s/ Elizabeth Andrion

Elizabeth Andrion  
Senior Vice President  
Regulatory Affairs

#### Attachment

cc: Commissioner Michael O'Rielly  
Commissioner Brendan Carr  
Nicholas Degani  
Rachael Bender  
Erin McGrath  
Will Adams  
Umair Javed  
William Davenport  
Donald Stockdale  
Dana Shaffer  
Joel Taubenblatt  
Matthew Pearl

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<sup>1</sup> See, e.g., Reply Comments of Charter Communications, Inc., GN Docket No. 18-122 (Dec. 11, 2018); Comments of Charter Communications, Inc., GN Docket No. 18-122 (Oct. 29, 2018); see also Letter from Elizabeth Andrion, Senior Vice President, Regulatory Affairs, Charter Communications, Inc., to Marlene H. Dortch, Secretary, FCC, GN Docket No. 18-122 (Feb. 22, 2019).



# **Wireless Technology**

## **March 2019**

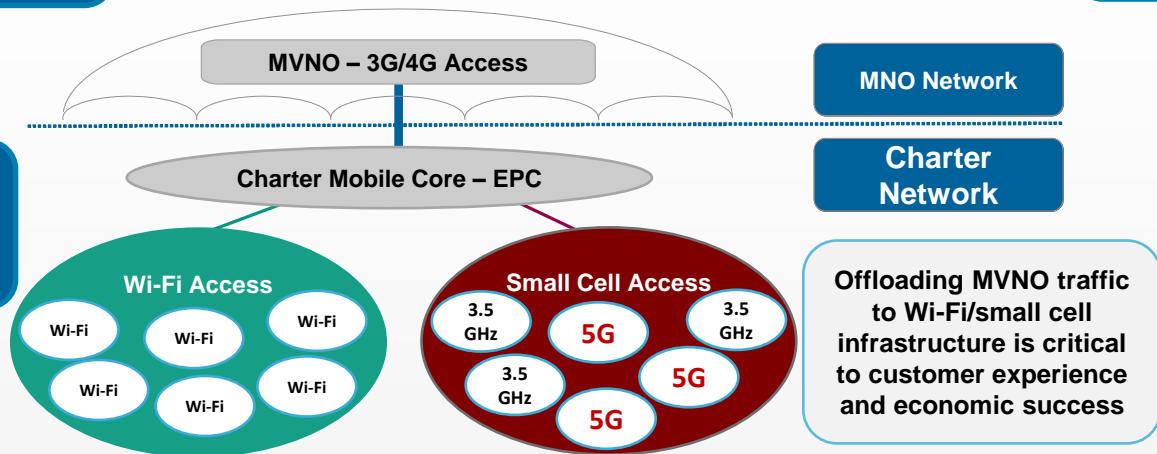
# Fixed Mobile Convergence

From “Wireless” to “Mobility”  
Umbrella MVNO for coverage,  
Wi-Fi/4G small cells for capacity

*Transition from nomadic Wi-Fi  
network to a full mobility network*

From Macro to Small Cell  
Densify with 4G Small Cells  
3.5GHz/CBRS

Inside-Out Strategy  
80% wireless traffic inside,  
Opportunistic outdoor



Wi-Fi Technology – Drives much higher bandwidth at much lower cost providing for efficient offload

3.5 GHz - Provides for licensed micro layer coverage and mobility.

5G Technology – Drives much higher bandwidth at much lower latency for next generation services (e.g. Autonomous Vehicles, Mobile, VR)

5G Solutions  
1000x capacity increase  
Ultra low latency  
1. Extreme Broadband  
2. Massive IoT  
3. Mission Critical Services

Business Value: Positioned to deploy existing assets – power, backhaul, ROW - to enable seamless connectivity

# MVNO Continuum

	Macro RAN Coverage	Product Roadmap Control	SIM Card Migration Control	Roaming Control	Small Cell Integration	WiFi Offload
Light MVNO	MNO Managed	MNO Managed	MNO Managed	MNO Managed	N/A	MVNO Managed
Service MVNO	MNO Managed	MVNO Managed	MVNO Managed	MNO/MVN O Managed	N/A	MVNO Managed

## MVNO Models with Small cell integration

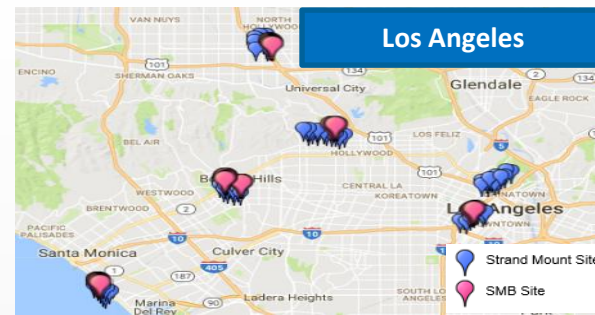
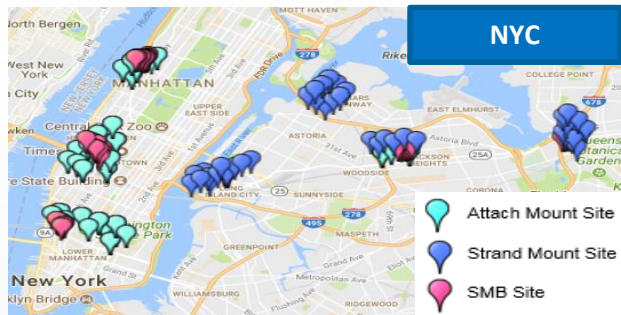
	Macro RAN Coverage	Product Roadmap Control	SIM Card Migration Control	Roaming Control	Small Cell Integration	WiFi Offload
Light MVNO Dual-SIM	MNO Managed	MNO/MVN O Managed	MNO/MVN O Managed	MNO/MVN O Managed	MVNO Managed	MVNO Managed
Full MVNO	MNO Managed	MVNO Managed	MVNO Managed	MVNO Managed	MVNO Managed	MVNO Managed

Ability to deploy and integrate small cells

# Charter CBRS Trial – Phase 2 + Dual SIM Development

*Validate efficacy of dual-SIM phone to seamlessly switch between small cell & macro*

*When proven, drives better connectivity and product control of mobility service*



- A total of 262 (142 in NY & 120 in LA) sites planned across New York and Los Angeles markets
- Multiple clusters designed in different morphologies such as Urban, Suburban, Industrial & Residential

Q1 2019

Q2 2019

Q3 2019

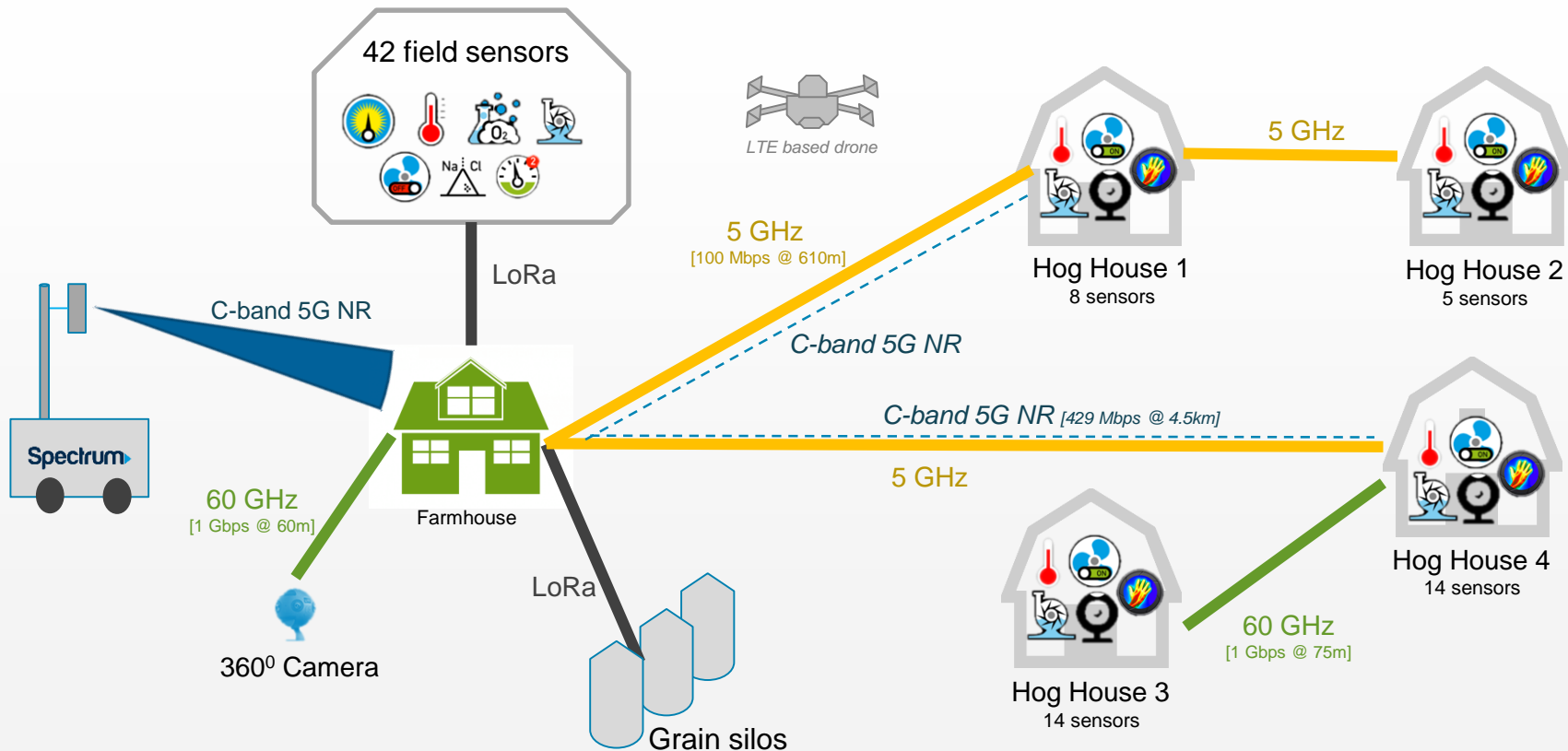
Q4 2019

1H 2020

2H 2020

# Smart Farm Field Test: C-Band, LoRA, and IoT

***Business Value:*** Combine licensed and unlicensed spectrum to maximize efficient cost structure for industrial IoT



# Mid-Band Spectrum – CBRS & C-Band

*CBRS is unique spectrum sharing band, but only identifies 70MHz of licensed spectrum, and with narrow channel sizes not ideal for 5G mobility.*

*C-Band identifies as much as 500MHz, with wide channel sizes suitable for true 5G mobility*

