

Safely Expanding Flexible Use

in the

5.925 GHz – 6.425 GHz Band

GN Docket 17-183

Encina Communications Corp.

The Problems

1. Industry needs large amounts of spectrum for 5G and Wi-Fi, without disrupting or causing harmful interference to existing licensees.

2. Pursuant to the Spectrum Pipeline Act, the Commission is required to submit a report to Congress no later than November 2, 2018 containing:

"... an analysis of proposals to promote and identify additional spectrum bands that can be shared between incumbent uses and new licensed and unlicensed services under such rules and identification of at least 1 gigahertz between 6 GHz and 57 GHz for such use."

3. Both industry and Congress have an urgent need for this spectrum now.

Encina Communications Corp.

A Simple and Safe Solution

1. License mobile base stations and Wi-Fi access points pursuant to Part 101 of the Rules (specifically Part 101.103) -- Part 101 rules and procedures have been in place, and have worked successfully, for decades.
2. Ensure that the signal power arriving at any existing licensed station or any new applicant station from a client device is always less than:
 - a) the permitted interference level (the level that would decrease the victim station's receive sensitivity by 1 dB)
 - b) the signal power from the client device's licensed base station or access point.

A Simple and Safe Solution

Simple because it is based on Part 101 Rules and Procedures.

Safe because – as required by Rule 101.103 – prior to deploying a new station, an applicant must have successfully completed the Prior Coordination Notice (PCN) process.

Once again, remember that Part 101 rules and procedures have been in place, and have worked successfully, for decades.

Encina Communications Corp.

Add One New Rule

§101.____

(a) **Fixed Stations** that support mobile, nomadic and/or fixed unlicensed client devices must comply with all the applicable parts of Rule 101, and in addition must:

- (1) Limit the EIRP to a maximum of 50 dBm.
- (2) Transmit its operating protocol (3GPP, 802.11 or proprietary).
- (3) Transmit its latitude, longitude and elevation AMSL.
- (4) Transmit the maximum distance (2 kilometers or less) that the client devices can be from the base station.

One New Rule (continued)

- (b) **Unlicensed client devices** must comply with all the applicable parts of Rule 101, and in addition must:
- (1) Have a maximum EIRP of 27 dBm.
 - (2) Listen before talk.
 - (3) Only transmit after it identifies a fixed licensed station with which it has the capability to communicate, and its distance from the fixed station and altitude are compliant with the requirements given by the licensed station.

Rule Change – 101.115

Rule 101.115(a) – *“~~Unless otherwise authorized upon specific request by the applicant, each~~ Stations authorized under the rules of this part must employ a directional antenna adjusted with the center of the major lobe of radiation in the horizontal plane directed toward the receiving station with which it communicates: provided, however, where a station communicates with more than one point, a multi- or omni-directional antenna ~~may be~~ is authorized ~~if necessary~~. New Periscope antenna systems will not, under ordinary circumstances, be authorized.”*

Benefit: Eliminates unnecessary delay after successful prior coordination.

Encina Communications Corp.

Rule Change – 101.143

Rule 101.143:

(a) Unchanged.

Rule 101.143:

(b) *For paths shorter than those specified in paragraph (a) of this section, the EIRP shall not exceed the value derived from the following equation: 50 dBm.*

[balance deleted]

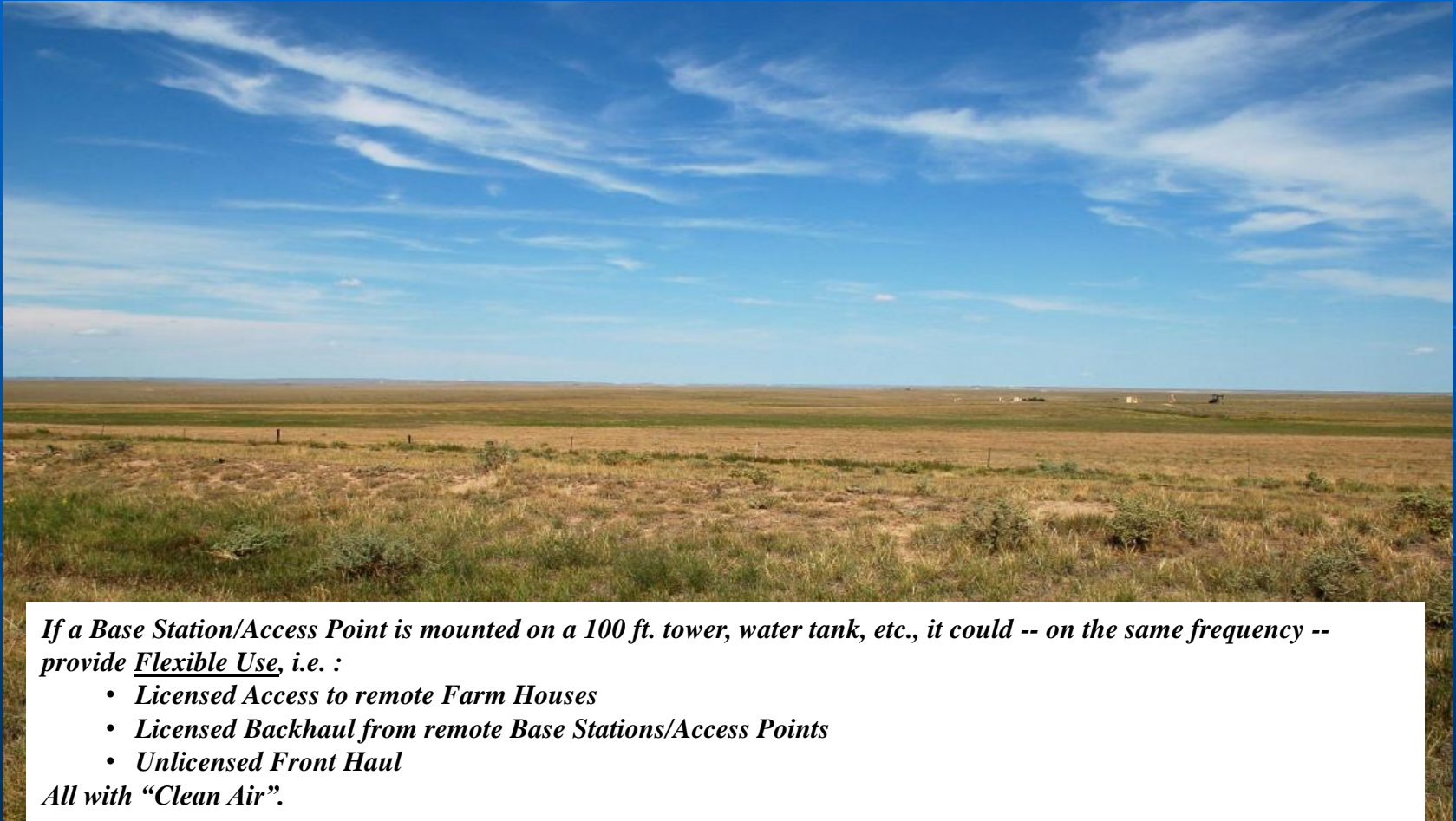
Rule 101.143:

(c) Deleted (related to equation in (b) above, no longer applicable).

Benefit: Makes it possible to operate at all distances below the minimum path length without unnecessary delay.

Encina Communications Corp.

Deployment Example – Rural (Clear Line of Sight)



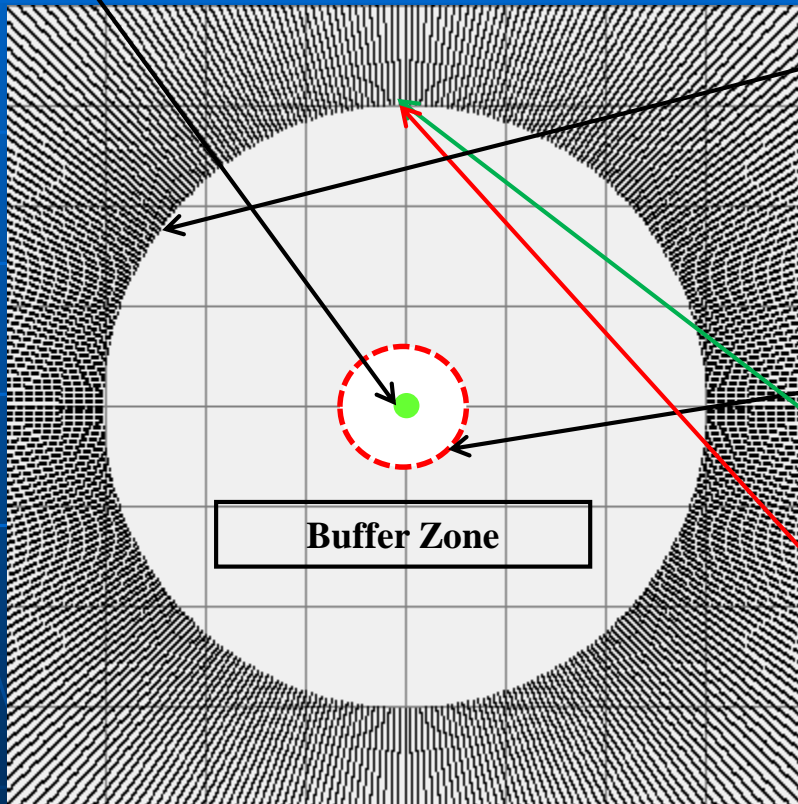
If a Base Station/Access Point is mounted on a 100 ft. tower, water tank, etc., it could -- on the same frequency -- provide Flexible Use, i.e. :

- *Licensed Access to remote Farm Houses*
- *Licensed Backhaul from remote Base Stations/Access Points*
- *Unlicensed Front Haul*

All with “Clean Air”.

Clear Line-of-Sight Illustration

Licensed Mobile Base Station/Access Point



Interference Contour around a Licensed Hub Station – within which a New Applicant will Not Prior Coordinate since it will Cause or Receive harmful interference.

Maximum Operating Radius (1.2 miles) from the Licensed Base Station/Access Point to Mobile/Wi-Fi Unlicensed devices

Interference at New Applicant from Licensed Base Station/Access Point: -101 dBm

Maximum Interference at New Applicant from Unlicensed Device at geo-fence: Always < -101dBm

Encina Communications Corp.

Deployment Example – Rural Town

(Potential Blockage of Base Station at Some Angles)



Deployment Example – Urban

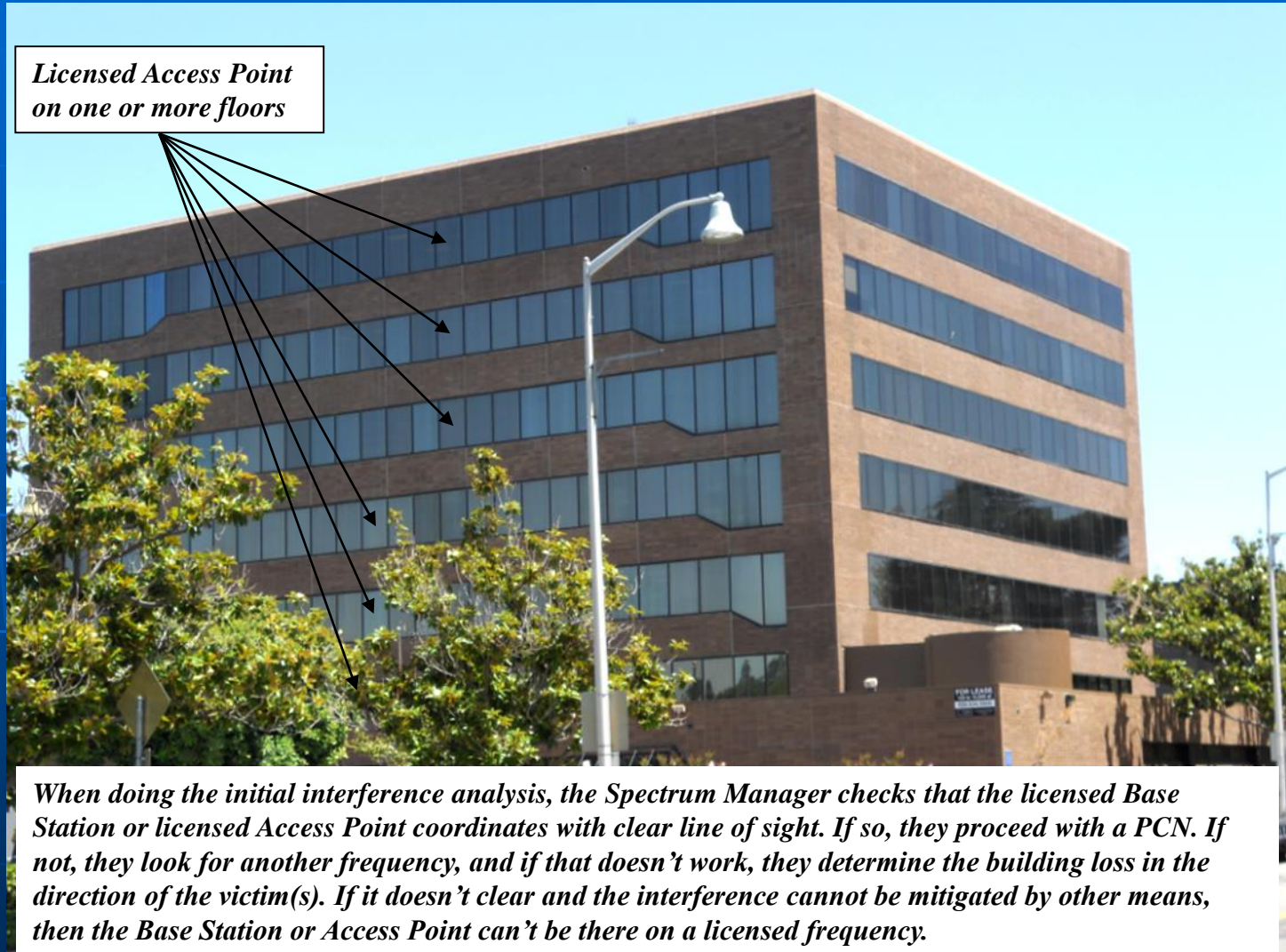
(Potential Blockage of Base Station at Some Angles)



When doing the initial interference analysis the Spectrum Manager checks that a Client Device at the Geo-Fence will not cause harmful interference. If it does, simply mitigate the issue (by reducing the diameter of the Geo-Fence, specifying coordinates where the Client device cannot transmit, or by other means).

Deployment Example – Inside an Office Building

(Base Station or Access Point Blocked at All Angles)



Summary

Unlicensed Use in Part 101 Bands

Imperative 1: *No Harmful Interference*

The proposed Part 101 rule changes completely satisfy this imperative.

Imperative 2: *Time is of the Essence*

To meet Congressional deadline and address the 5G & Wi-Fi imperatives, ECC respectfully requests the Commission immediately issue an NPRM for the 5.925 GHz – 6.425 GHz band to add the proposed new Part 101 rule and the two rule modifications, and to positively and expeditiously respond to requests for Waivers-of-the-Rules pending a rulemaking.

Conclusion

To solve the problem of increasing the efficient use of Part 101 licensed spectrum, ECC has expended considerable R&D resources to make safe, expanded flexible use of mid-band spectrum possible with readily available hardware and software, using established Part 101 procedures with existing industry standards (3GPP & 802.11). ECC is therefore looking forward to using its know-how and IP to work with stakeholders to rapidly bring the benefits of mid-band 4G/5G mobile and Wi-Fi devices to urban, suburban and rural subscribers nationwide.

Thank you.

Encina Communications Corp.