

Richardson STA Design and ES Interference Analysis

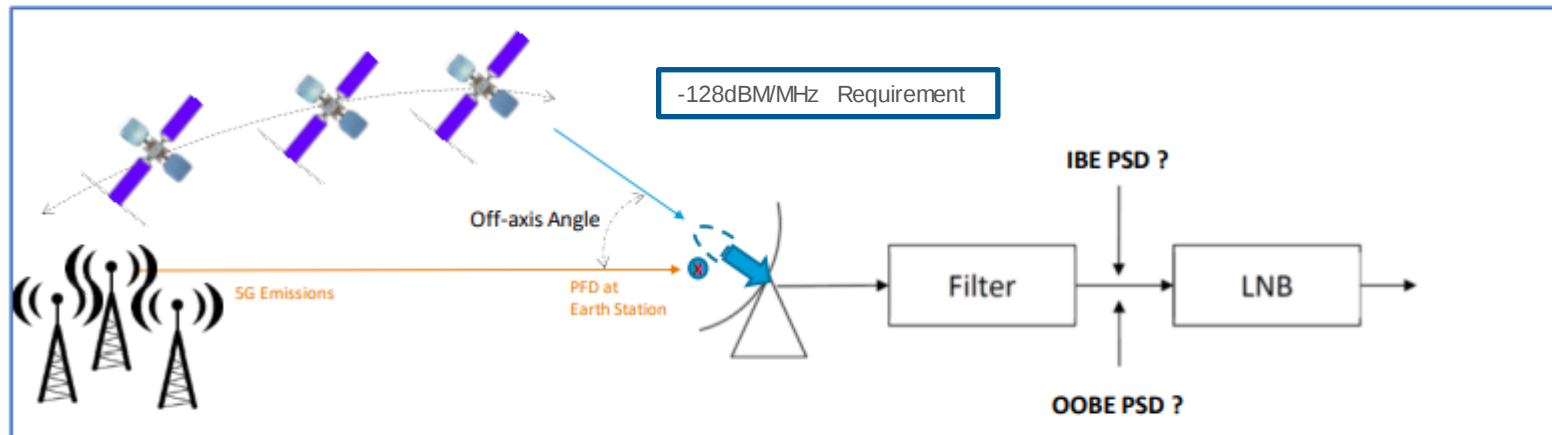


ES Interference Background



Figure 1: C-Band Reallocation

3.1.2 PFD to PSD Conversion



BS Tx: 3.8-3.9GHz

Figure 2: Calculation of aggregate In-Band and Out-of-Band 3.7 GHz Service PSD levels

Methods to meet ES interference requirement

- PSD Requirement at ES: -128dBm/MHz
- Interfering Base Station parameters that can influence the PSD at ES
 - BS Tx Power: **Common** vs User Beam
 - Antenna Orientation: F-B Ratio → **45dB**, Sidelobe suppression → **0-30dB+** for NLOS ES in Richardson area
 - Tx OOB information: TBD
 - Beam-nulling → **30dB+** in direction of ES if utilized
- GES Information: TBD, applied if known (-5dB for ES at 165m, ~77degree TN)

3.1.2 PFD to PSD Conversion

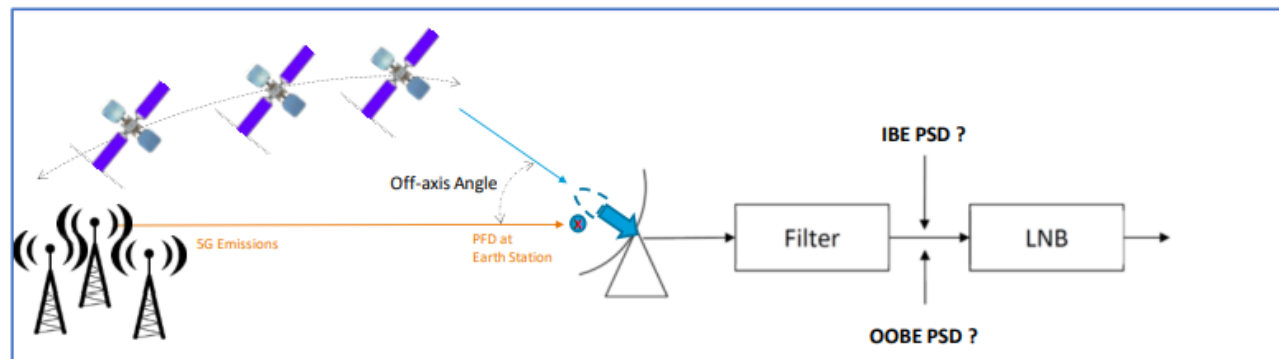


Figure 2: Calculation of aggregate In-Band and Out-of-Band 3.7 GHz Service PSD levels

gNB Tx Power Profiles

User Beam		Common Beam	
Lo Power EIRP	Hi Power EIRP	Lo Power EIRP	Hi Power EIRP
45	69.6	29.8	54.4

Two Power Settings: Hi and Low

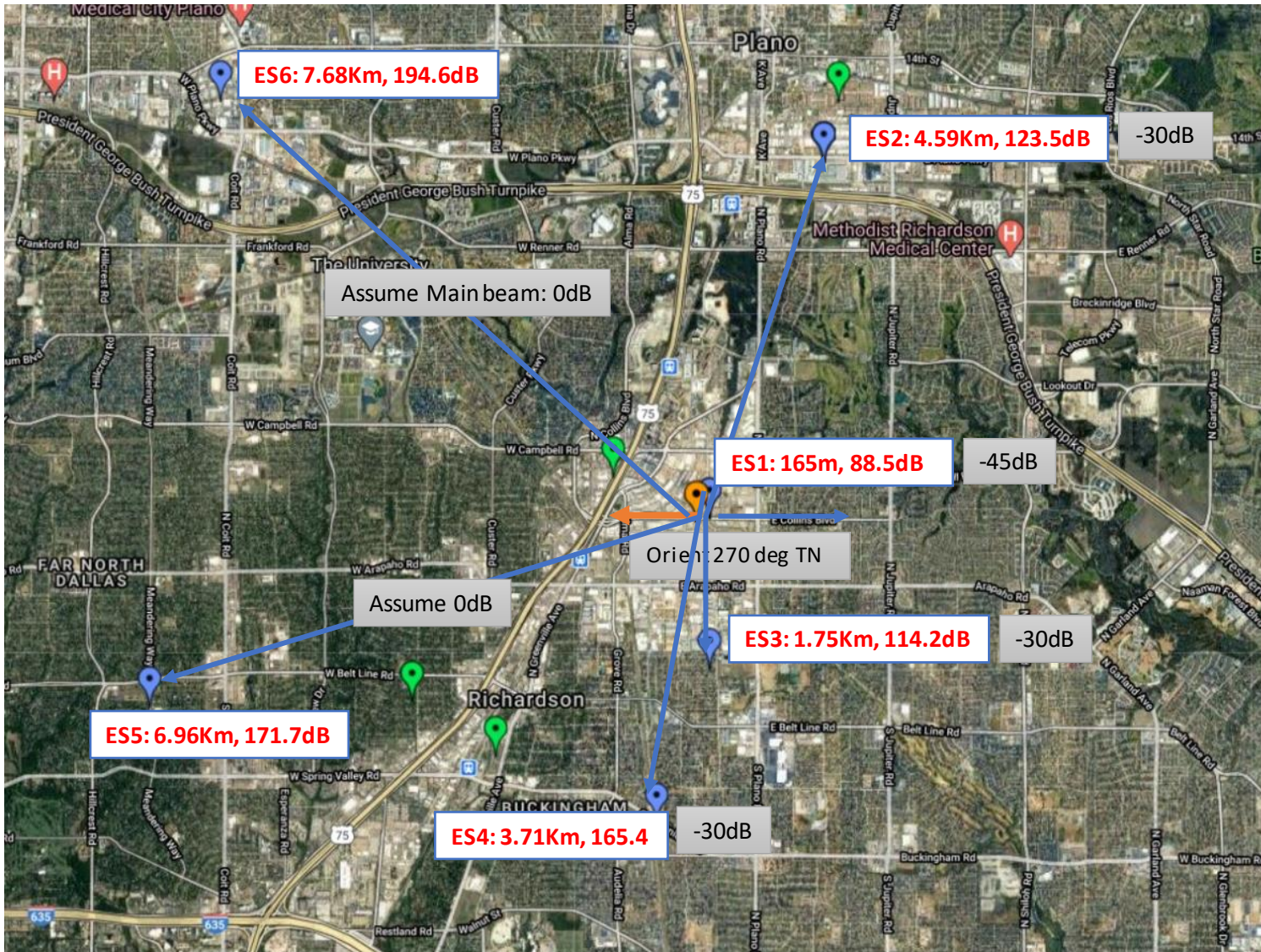


Mavenir Tx Height @ RC 12m

Richardson
Mavenir STA Analysis

ES #	ES Site Name	ES Call Sign	ES RC Height	Terrain Loss	ES Gain to Mavenir
1	RICHARDSON	E200449	6.1m	88.5dB	-5.00
2	PLANO	E181167	7	123.5dB	-9.50
3	RICHARDSON	E990177	6	114.2dB	-10.00
4	RICHARDSON	E191222	5	165.4dB	-10.00
5	DALLAS	E191222	4	171.7dB	-1.81
6	PLANO	E181749	3	194.6dB	-4.03

Impact to ES due to Mavenir Tx based on Terrain Profiled Losses [Terrain Losses Computed by Comsearch]



Lo-power Common Beam: 29.8dBm EIRP

ES	Low Power EIRP[dBm//MHz]	Antenna Pattern	Total Terrain Loss [dB]	GES [dB]	Rx at ES [dBm/MHz]
ES1	9.8	-45	88.5	-5	-128.7
ES2	9.8	-30	123.5	-9.5	-153.2
ES3	9.8	-30	114.2	-10	-144.4
ES4	9.8	-30	165.4	-10	-195.6
ES5	9.8	0	171.7	-1.8	-163.71
ES6	9.8	0	194.6	-4	-188.83

Hi-power Common Beam: 54.4dBm EIRP

ES	Low Power EIRP[dBm//MHz]	Antenna Pattern	Total Terrain Loss	GES [dBm/MHz]	Rx at ES [dBm/MHz]
ES1	34.4	-45	88.5	-5	-104.1
ES2	34.4	-30	123.5	-9.5	-128.6
ES3	34.4	-30	114.2	-10	-119.8
ES4	34.4	-30	165.4	-10	-171
ES5	34.4	0	171.7	-1.8	-139.11
ES6	34.4	0	194.6	-4	-164.23

- Lo-power operation calculations just pass requirements
- ES1 and ES2 are impacted by High Power Operation

Recommendation

- Request authorization for low power operation with a 270 degree TN orientation of the antenna
- File with all ES operators (ES1-ES6) in the vicinity at 29.8dBm Common beam EIRP
- Allow for “stop buzzer” authorization