

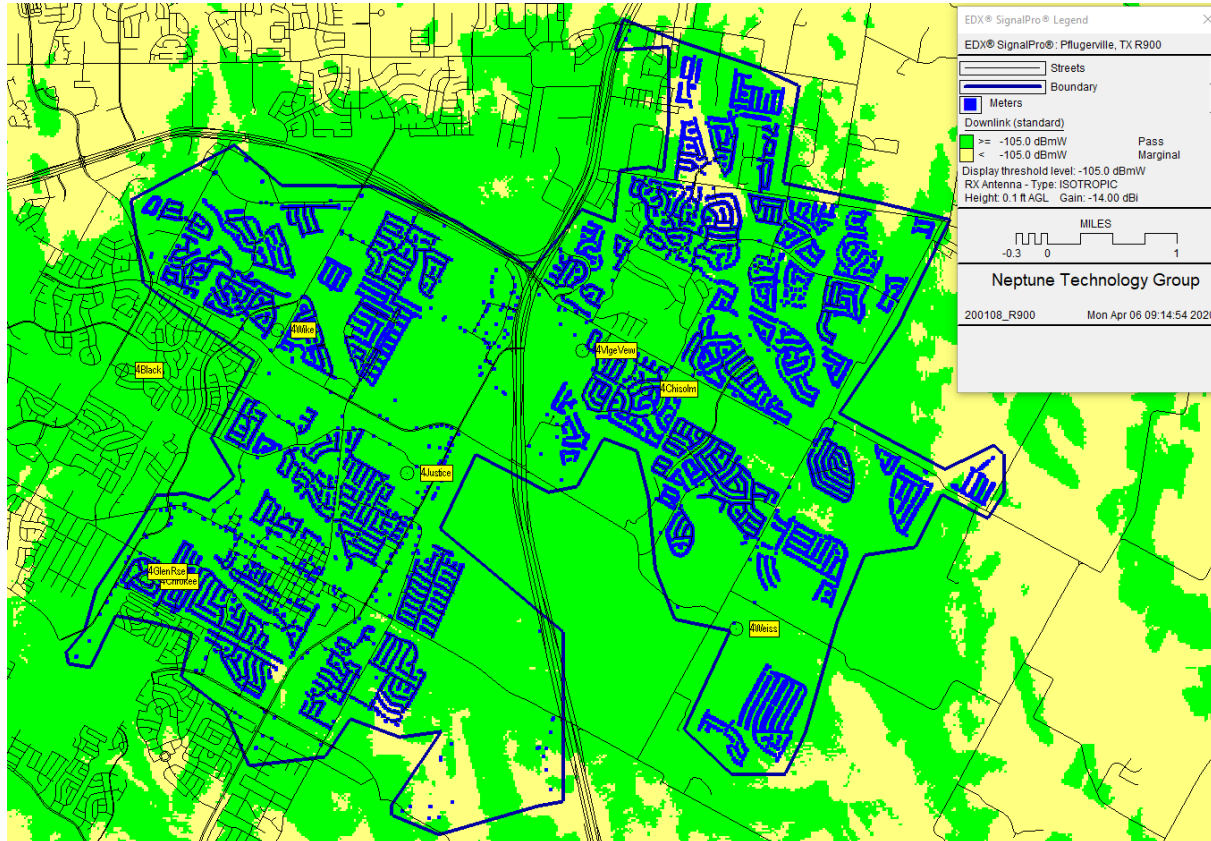
R900 Propagation Analysis
Pflugerville, TX
April 6, 2020



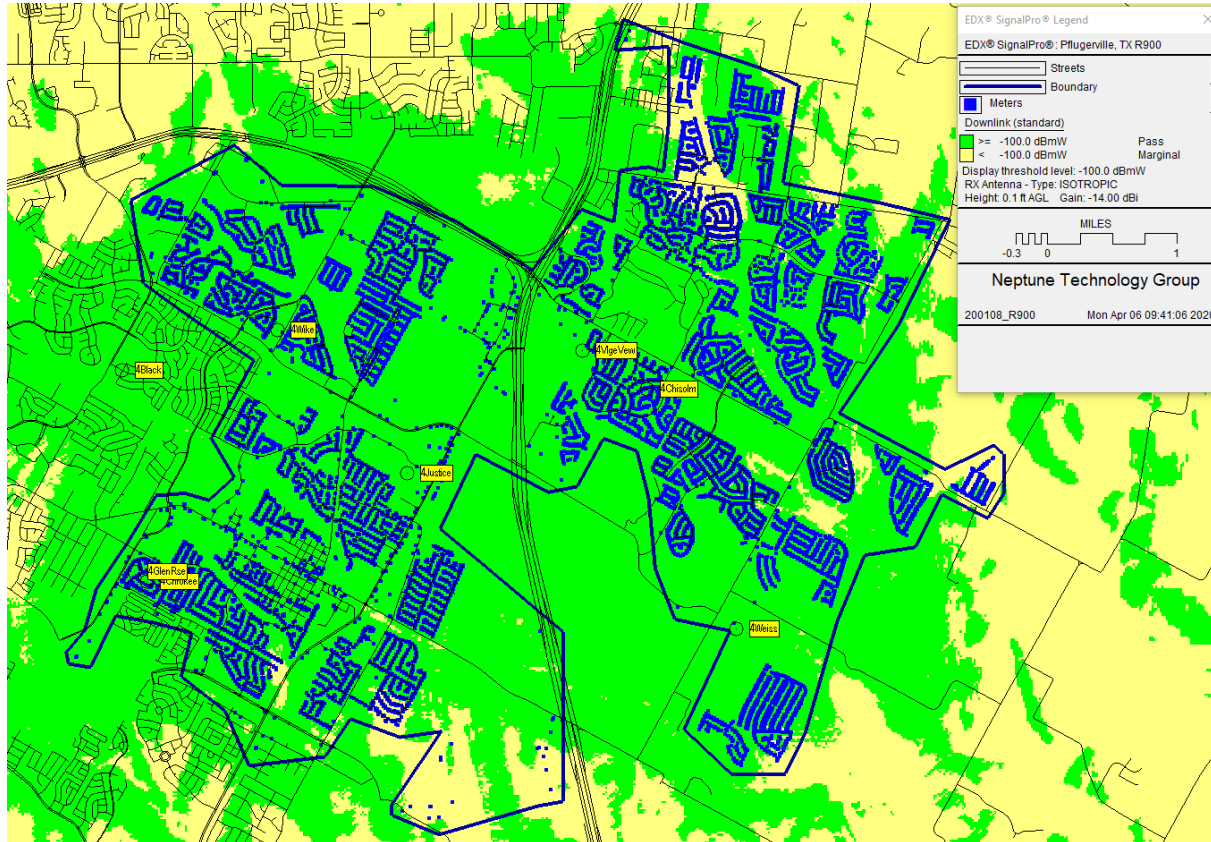
Predicted Coverage Results:

Map	Description	Provided Services		19,978	Geocoded Services		19,977	Area (sq Miles)	21.79	sq Mi /Coll
		#Coll	MIU Type	Read Type	Pass	%Pass	Pass	%Pass		
1a	Provided	8	R900v4 Pit	Billing	19,071	95.46%	20.59	94.46%	2.6	
1b	Provided	8	R900v4 Pit	Daily	18,594	93.07%	19.93	91.44%	2.5	
2a	Best Provided	4	R900v4 Pit	Billing	18,434	92.27%	20.07	92.12%	5.0	
2b	Best Provided	4	R900v4 Pit	Daily	17,423	87.21%	18.97	87.05%	4.7	
3a	>99%	7	R900v4 Pit	Billing	19,840	99.31%	21.17	97.14%	3.0	
3b	Map 3a as Daily	7	R900v4 Pit	Daily	19,682	98.52%	20.74	95.19%	3.0	
4	>99%	8	R900v4 Pit	Daily	19,843	99.32%	21.32	97.83%	2.7	

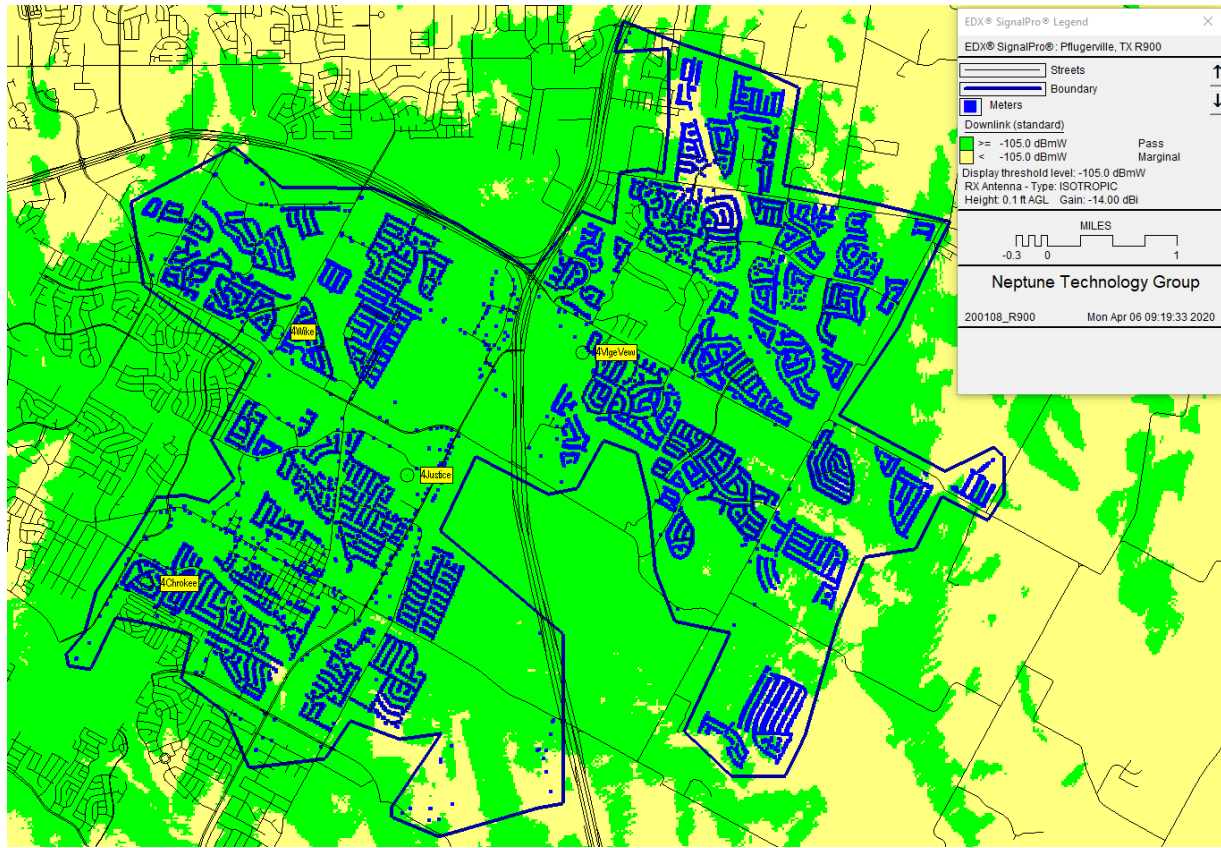
Map 1a: Provided Assets as Billing



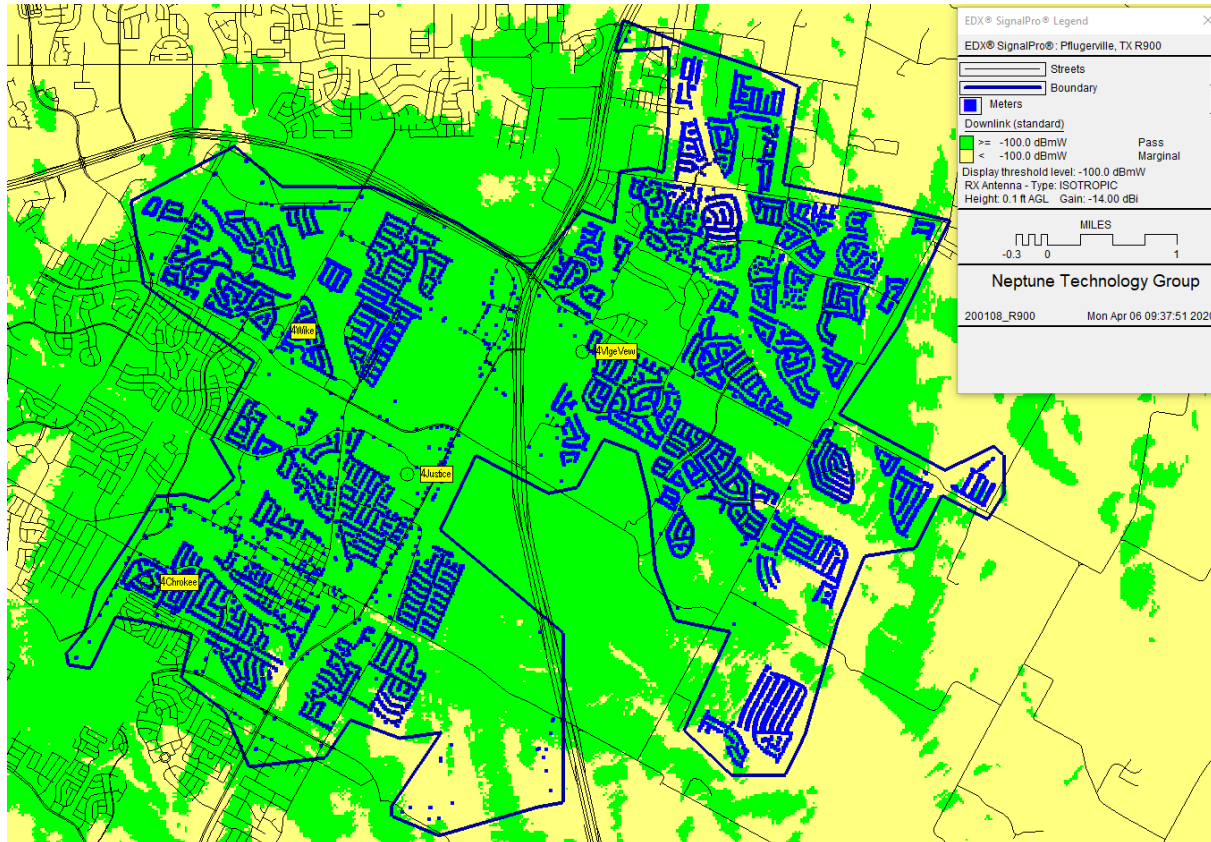
Map 1b: Provided Assets as Daily



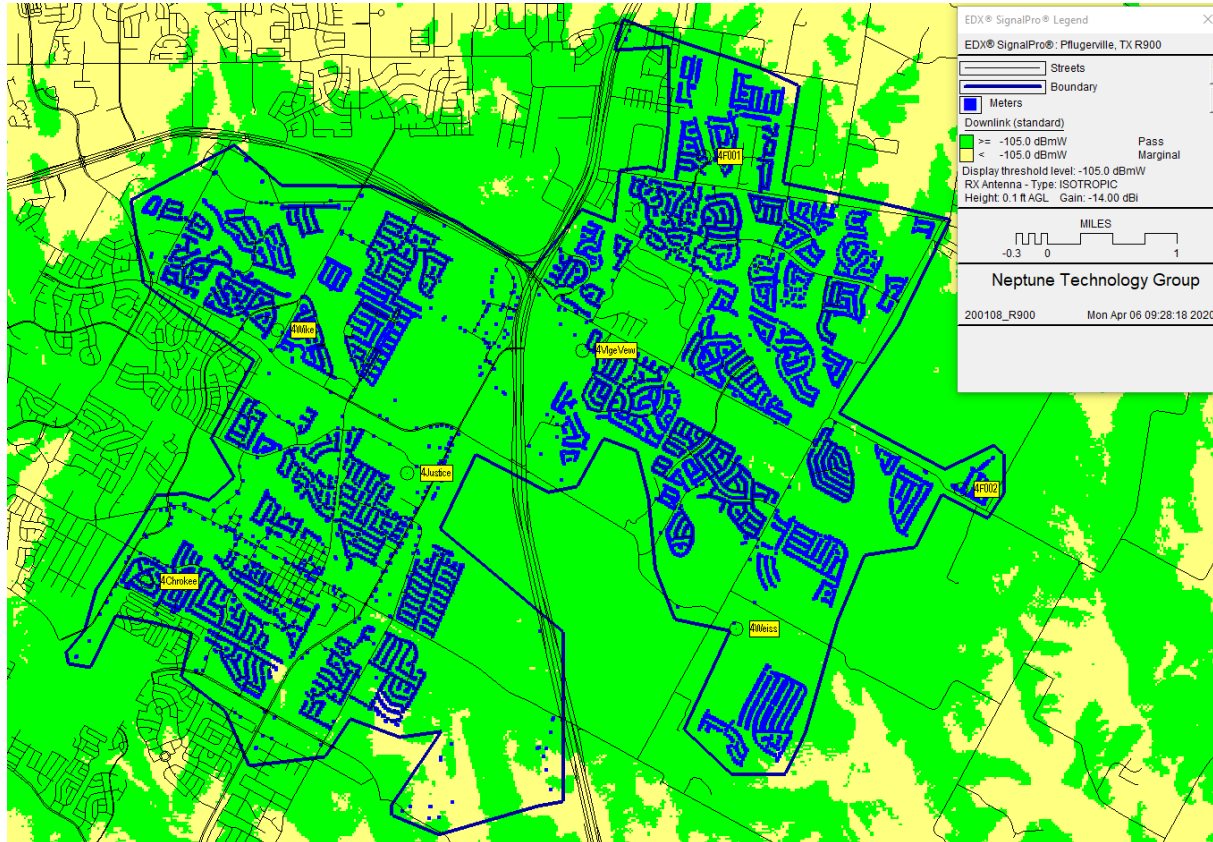
Map 2a: Best Provided Assets as Billing



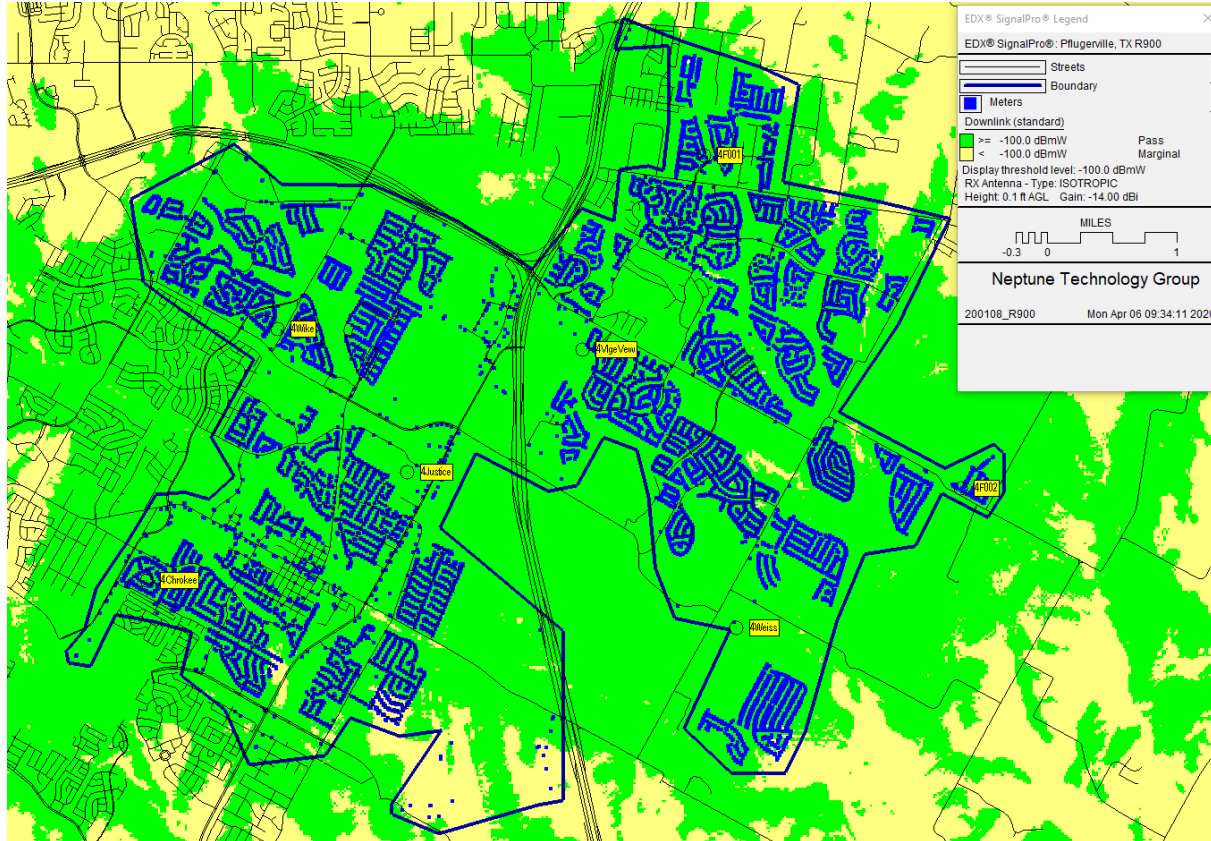
Map 2b: Best Provided Assets as Daily



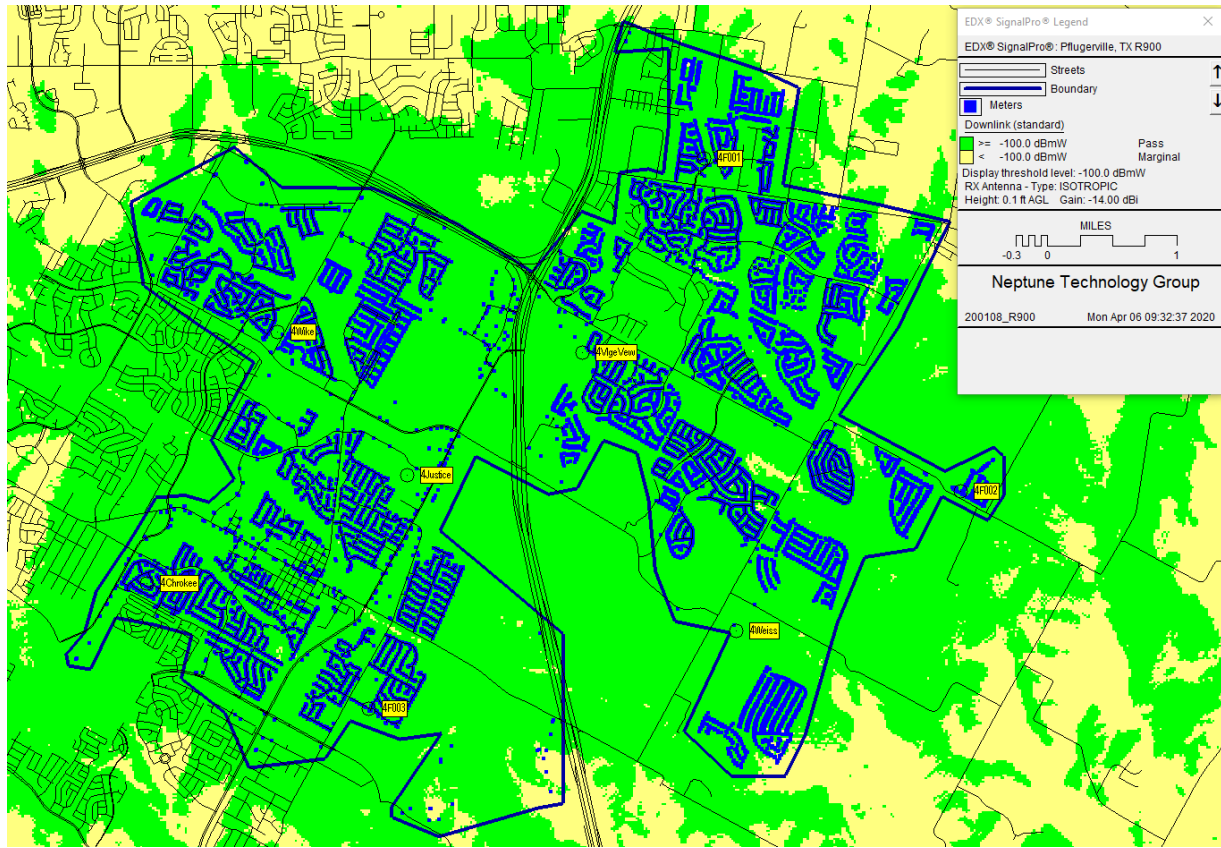
Map 3a: >99% predicted (Billing)



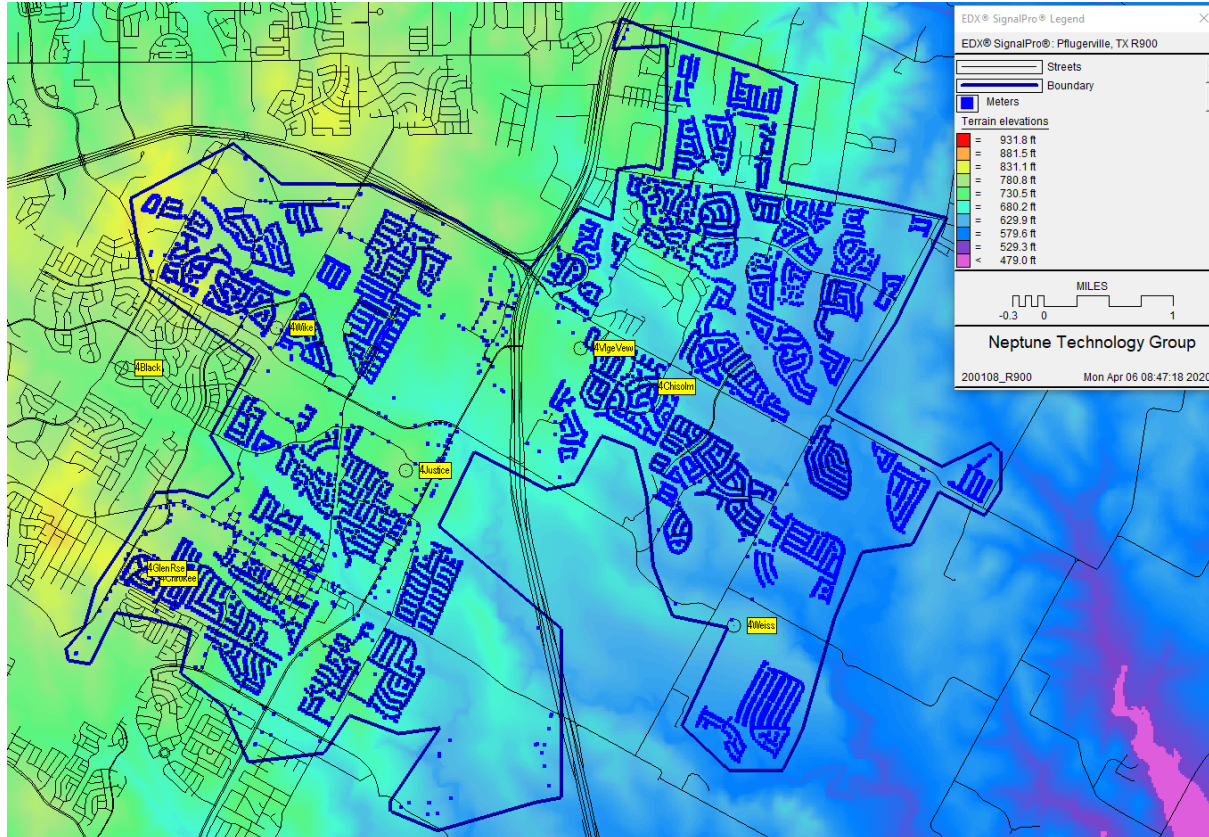
Map 3b: Map 3a as Daily



Map 4: >99% predicted (Daily)



Elevation Map (National Elevation Dataset available, courtesy of the U.S. Geological Survey)



Gateway Locations:

Map	Location	Latitude	Longitude	Collector	Elev(m)	AntHgt(m)	Elev(ft)	AntHgt(ft)	Coax Type	Coax(ft)	Antenna
1,2,3,4	4Chrokee	30.439171	-97.641797	GPV4	251	37	823	120	AVA5	120	MFB9155
1,2,3,4	4Justice	30.451128	-97.608562	GPV4	231	40	758	132	AVA5	132	MFB9155
1,2,3,4	4VlgeVew	30.464692	-97.586165	GPV4	220	49	722	162	AVA5	162	MFB9155
1,2,3,4	4Wike	30.466893	-97.625096	GPV4	237	57	778	186	AVA5	186	MFB9155
1,3,4	4Weiss	30.433934	-97.56652	GPV4	196	23	643	75	LDF4	75	MFB9155
1	4Black	30.4625	-97.645043	GPV4	230	23	755	75	LDF4	75	MFB9155
1	4Chisolm	30.46045	-97.578035	GPV4	206	23	676	75	LDF4	75	MFB9155
1	4GlenRse	30.440243	-97.643421	GPV4	247	23	810	75	LDF4	75	MFB9155
3,4	4F001	30.486126	-97.570678	GPV4	209	23	686	75	LDF4	75	MFB9155
3,4	4F002	30.449331	-97.53792	GPV4	190	23	623	75	LDF4	75	MFB9155
4	4F003	30.4253	-97.613477	GPV4	217	23	711	75	LDF4	75	MFB9155

Conditions:

- Spare gateway recommended for system maintenance.
- Revised propagation analysis required for Gateway location or height changes.
- FAA/ASR may be required for structures near airports or heights >200ft.
- AM Tower detuning evaluations for structures within 3km, check with LBA Group or Sitesafe.
- 10ft minimum vertical separation from other 900MHz system antennas on structure. Antenna requires 3ft-4ft standoff for side mounting on towers.
- Complies with FCC/IC Rules: May not cause harmful interference, and must accept any interference received, including interference that may cause undesired operation.
- MIUs mounted inside structures are not recommended for Fixed Network solutions. RF signal is affected differently by building materials used within structures and it is difficult to account for all types of construction. If the Scope states inside MIU used for study, an average loss value is applied to the model. In situations, where inside MIUs do not perform as necessary, an external wall MIU or additional Gateways may be required
- Propagation based on defined MIU (External Wall or Pit w/External Antenna) with specified gateway/collector. Older equipment should be replaced. Propagation is subject to change based on equipment specifications and performance. Performance cannot be confirmed until final system evaluation and analysis complete. Propagation model is based on performance for >90% daily read success and typical noise level <-120dBm. Use of this propagation analysis done with this understanding and there is no guarantee of product or performance. Additional gateways could be required. Antenna heights are set to 75 feet as default unless heights provided. This affects Find (search ring) and asset locations.
- R900 IoT gateway (Tmega) propagation in development. Two antenna receiver diversity requires minimum of 6 feet horizontal and ideally 12-20 feet horizontal antenna separation. Coax(dB) of 1.0 dB based on 20ft LMR400 or 50ft LDF4-50 coax cable jumper from gateway to antenna.