

Sprint 9-1-1 Overview

of the

CALNENA E9-1-1 Phase II Location Accuracy

FCC Filing

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Current Enhanced 9-1-1 Compliance

Sprint's nationwide wireless network is compliant with the current FCC location accuracy rules on a per-county basis:

- 50 meters for 67 percent of calls
- 150 meters for 80 percent of calls
- Sprint does not currently exclude any counties from the 150 meter requirement based upon heavy forestation

Future Enhanced 9-1-1 Compliance

Looking ahead, Sprint is working toward compliance with the 2016 FCC benchmark which changes the 150 meters to 90% of calls.

- Approximately 80% of Sprint's nationwide wireless network already complies.
 - California is estimated to be almost 100%.

E9-1-1 Compliance in California

Sprint has concluded that CALNENA's analysis of its own data is an inaccurate representation of wireless carriers ability to deliver enhanced 9-1-1 Phase II information.

Specific to California, Sprint has verified it is compliant in every county for E9-1-1 location accuracy within FCC mandated metrics based on testing data for the past 2 years.

Whereas, CALNENA claims Sprint's Phase II performance for December 2012 was 21%.

E9-1-1 Compliance in California

Sprint maintains, internal to our network, a location accuracy management platform that continually tests location accuracy within Sprint's coverage area.

Location accuracy devices have been installed throughout the Sprint coverage area that simulate 9-1-1 calls to the platform through the Sprint network. The data is then compared against OET-71 compliance at the county level.

The following slides contain a summary analysis for counties in California from 09/19/2011 through 09/16/2013, including specific highlights for the five counties analyzed by CALNENA.

Summary of 2016 Level Compliance for California

ST	County	Pass	# Calls	67%	90%		ST	County	Pass	# Calls	67%	90%
CA	Amador	P	27	35	78		CA	Los Angeles	P	33812	26	56
CA	Butte	P	4152	31	87		CA	Madera	P	160	44	91
CA	Colusa	P	507	41	131		CA	Marin	P	477	33	88
CA	Contra Costa	P	2392	28	67		CA	Merced	P	345	46	125
CA	El Dorado	P	367	28	74		CA	Mono	P	18	38	46
CA	Fresno	P	3464	40	102		CA	Monterey	P	531	31	65
CA	Glenn	P	576	31	62		CA	Napa	P	423	28	61
CA	Humboldt	P	344	34	71		CA	Nevada	P	367	35	85
CA	Imperial	P	165	43	124		CA	Orange	P	44188	29	70
CA	Inyo	P	72	32	91		CA	Placer	P	3585	33	86
CA	Kern	P	3125	28	56		CA	Riverside	P	15932	36	101
CA	Kings	P	624	40	86		CA	Sacramento	P	16531	33	81
CA	Lassen	P	25	36	46		CA	San Benito	P	152	28	75
							CA	San Bernardino	P	20718	30	77

Summary of 2016 Level Compliance for California, continued

ST	County	Pass	# Calls	67%	90%		ST	County	Pass	# Calls	67%	90%
CA	San Diego	P	49121	33	91		CA	Siskiyou	P	498	34	80
CA	San Francisco	P	6110	21	39		CA	Solano	P	6013	24	50
CA	San Joaquin	P	887	41	124		CA	Sonoma	P	1440	33	89
CA	San Luis Obispo	P	3976	28	61		CA	Stanislaus	P	386	37	117
CA	San Mateo	P	9790	24	48		CA	Sutter	P	2204	28	68
CA	Santa Barbara	P	9389	26	56		CA	Tehama	P	2907	31	64
CA	Santa Clara	P	6299	24	47		CA	Tulare	P	3837	36	84
CA	Santa Cruz	P	184	34	63		CA	Ventura	P	334	23	46
CA	Shasta	P	8530	25	49		CA	Yolo	P	2669	39	128

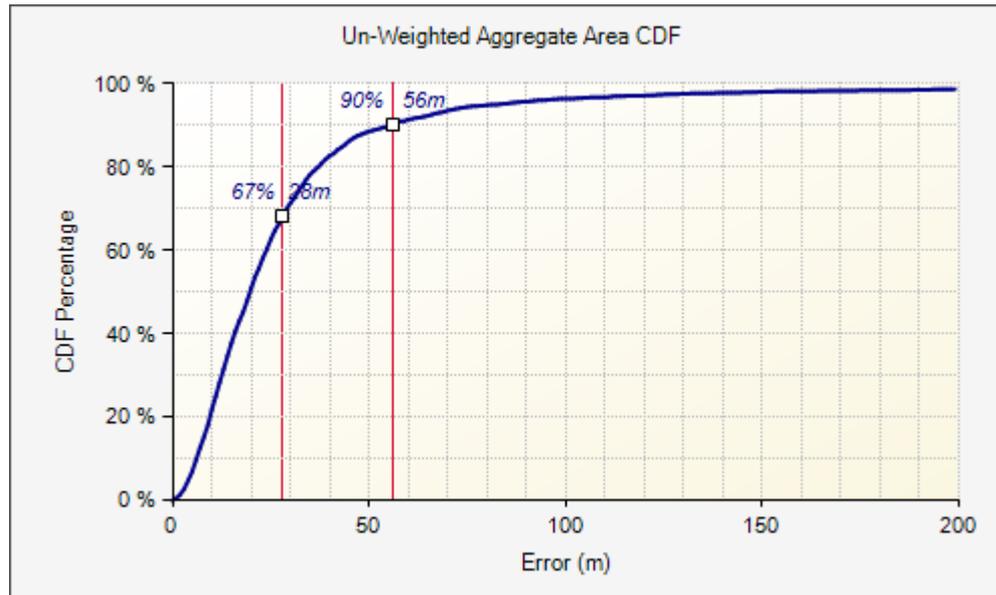
PSAP Bidding Frequency

Sprint has analyzed actual 9-1-1 call data from December 2012 for the five PSAPs mentioned in the CALNENA filing and has made the following conclusions regarding the frequency of PSAP re-bids for Phase II location information:

- Bakersfield PD: 2319 calls; 798 rebids (34%)
- Pasadena PD: 552 calls; 86 rebids (15%)
- Kern County Sheriff: 1385 calls; 635 rebids (45%)
- Ventura SO: 921 calls; 316 rebids (34%)
- San Jose PD/FD: 2560 calls; 316 rebids (12%)
- San Francisco CECC: 1880 calls; 97 rebids (9%)

Kern County, CA (Bakersfield PD included)

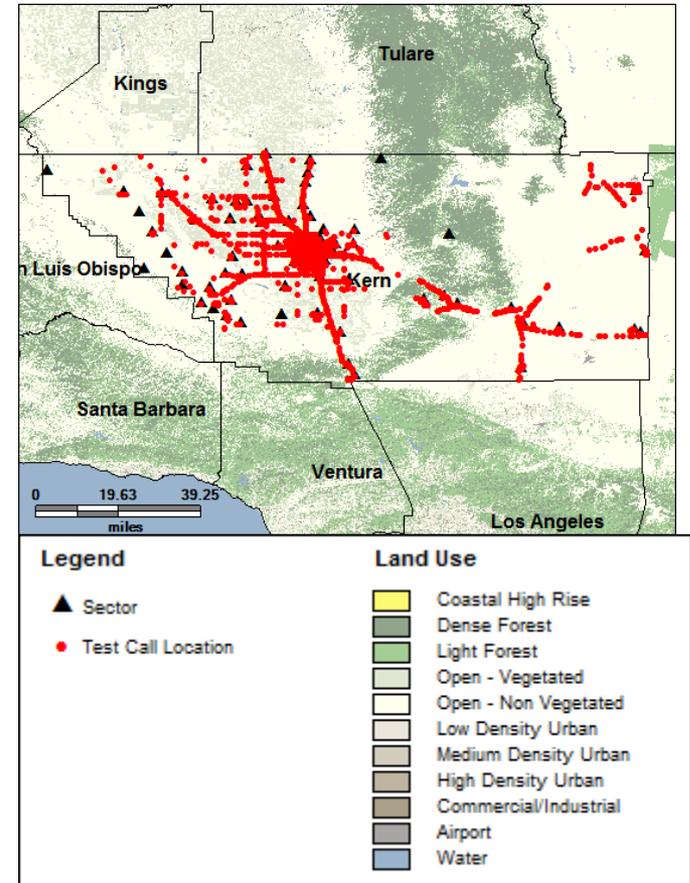
# Calls	67% Error	90% Error	Conf. Int.	Yield%
3125	28	56	[29, 57] @ 90.02 %	94.07 %



Kern County, CA (Bakersfield PD)

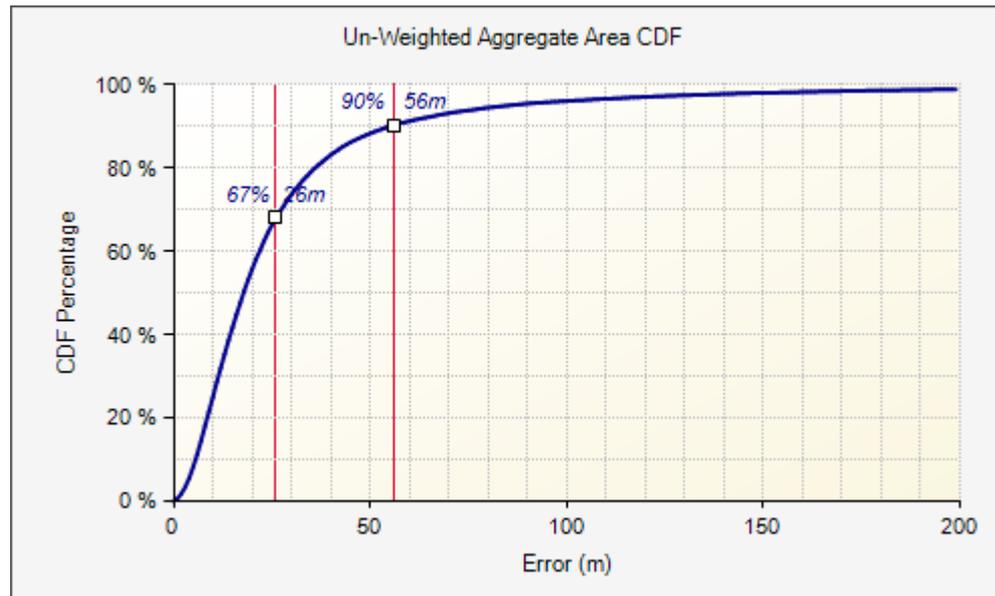
Land Use Type	# Calls	% of Valid Calls	67% Error	90% Error	Land Use %
Open - Non Vegetated	1703	54.50 %	29	60	72.35 %
Low Density Urban	463	14.82 %	23	44	0.82 %
Open - Vegetated	447	14.30 %	30	67	10.00 %
Commercial/Industrial	194	6.21 %	26	47	0.17 %
Dense Forest	68	2.18 %	32	65	9.18 %
Medium Density Urban	38	1.22 %	30	41	0.05 %
Light Forest - Shrub/Scrub Vegetation	24	0.77 %	36	58	7.19 %
Water	15	0.48 %	31	76	0.16 %
Airport	1	0.03 %	14	14	0.09 %

Kern County Test Call Locations



Los Angeles County (Pasadena PD included)

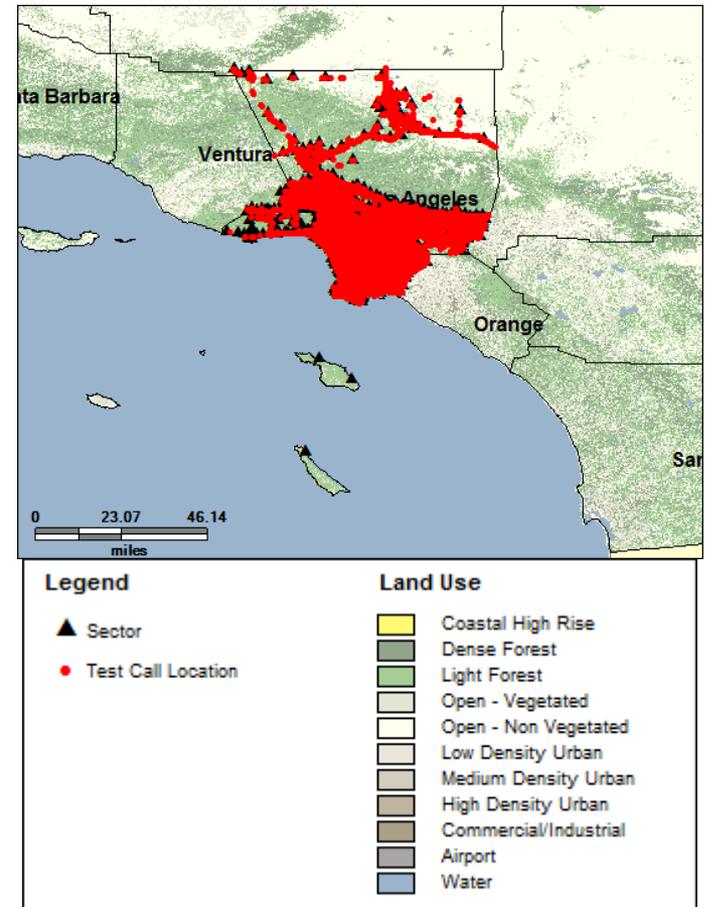
# Calls	67% Error	90% Error	Conf. Int.	Yield%
33812	26	56	[27, 57] @ 90.02 %	97.09 %



Los Angeles County (Pasadena PD included)

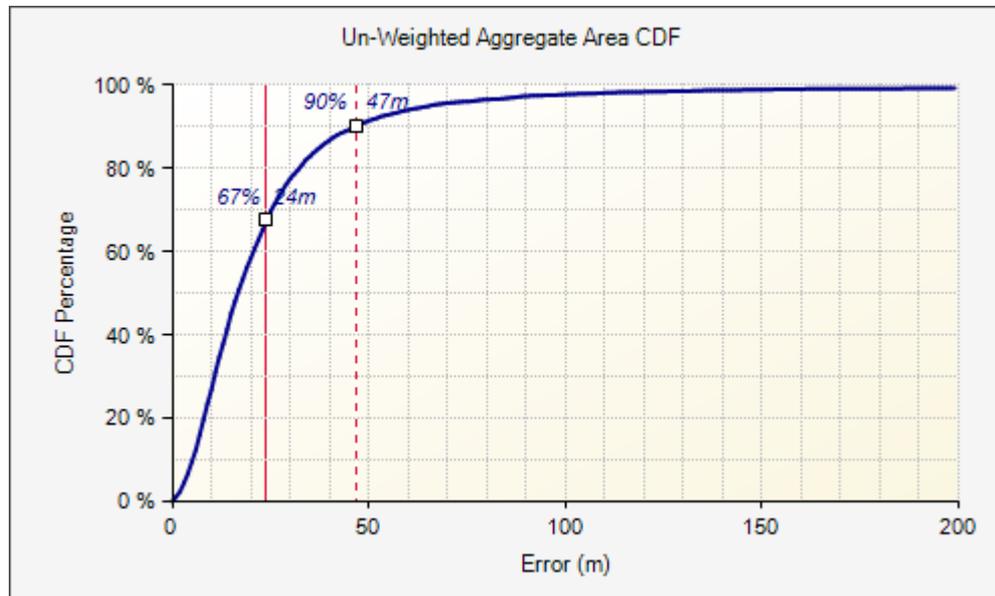
Land Use Type	# Calls	% of Valid Calls	67% Error	90% Error	Land Use %
Open - Non Vegetated	13967	41.31 %	27	58	37.34 %
Low Density Urban	9468	28.00 %	26	55	9.42 %
Medium Density Urban	4562	13.49 %	23	45	1.34 %
Commercial/Industrial	2069	6.12 %	25	52	1.30 %
Light Forest - Shrub/Scrub Vegetation	1285	3.80 %	31	70	28.32 %
Dense Forest	819	2.42 %	29	73	9.39 %
Open - Vegetated	298	0.88 %	26	65	5.19 %
Airport	31	0.09 %	27	52	0.14 %
High Density Urban - City Center	27	0.08 %	72	160	0.00 %
Water	8	0.02 %	25	49	7.57 %

Los Angeles County Test Call Locations



Santa Clara County (San Jose PD included)

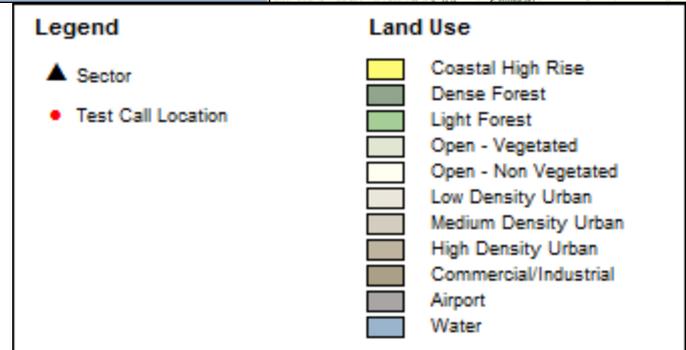
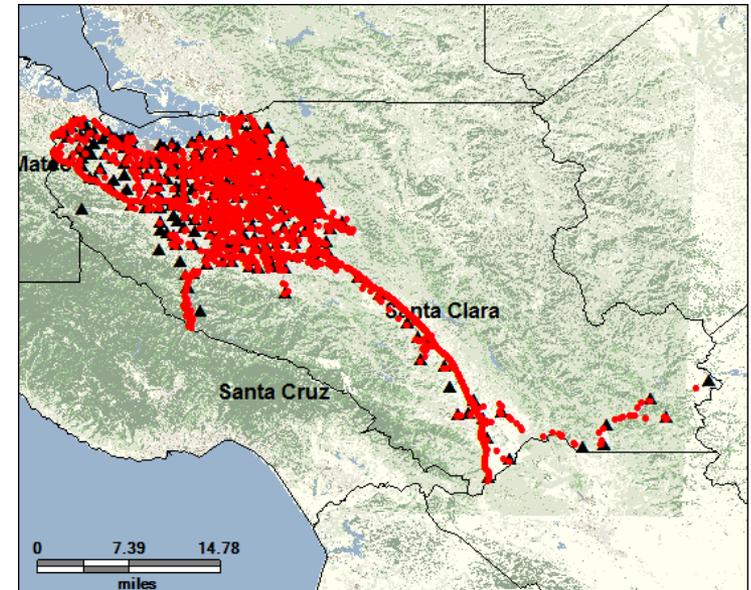
# Calls	67% Error	90% Error	Conf. Int.	Yield%
6299	24	47	[25, 48] @ 90.02 %	96.24 %



Santa Clara County (San Jose PD included)

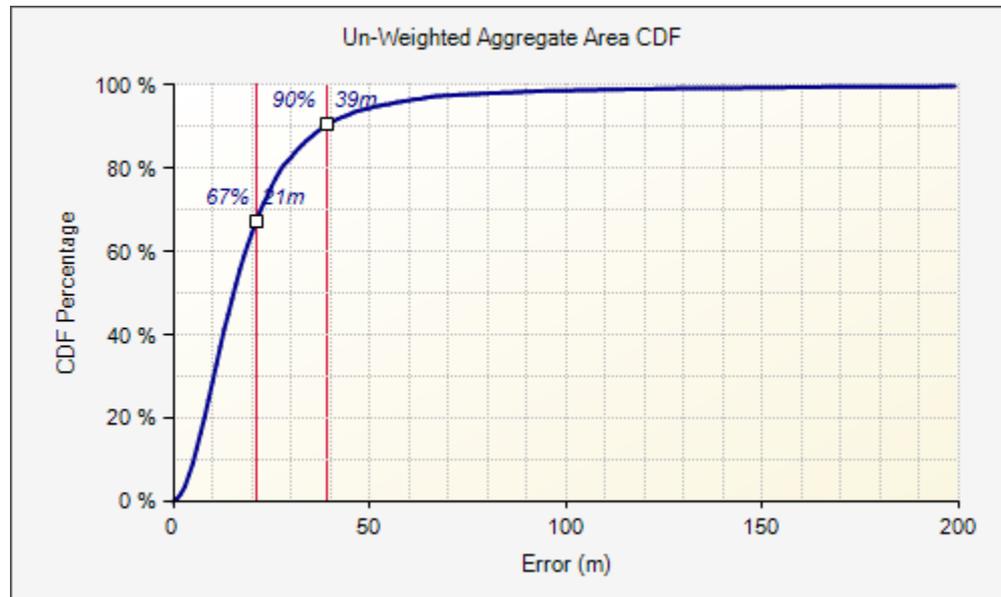
Land Use Type	# Calls	% of Valid Calls	67% Error	90% Error	Land Use %
Open - Non Vegetated	2498	39.66 %	25	52	28.37 %
Low Density Urban	1566	24.86 %	23	42	7.52 %
Medium Density Urban	1048	16.64 %	24	45	1.62 %
Commercial/Industrial	504	8.00 %	22	38	1.12 %
Open - Vegetated	302	4.79 %	27	60	34.12 %
Dense Forest	55	0.87 %	31	74	17.36 %
Light Forest - Shrub/Scrub Vegetation	30	0.48 %	25	68	7.34 %
High Density Urban - City Center	13	0.21 %	38	99	0.01 %
Airport	4	0.06 %	19	34	0.13 %
Water	1	0.02 %	63	63	2.42 %

Santa Clara County Test Call Locations



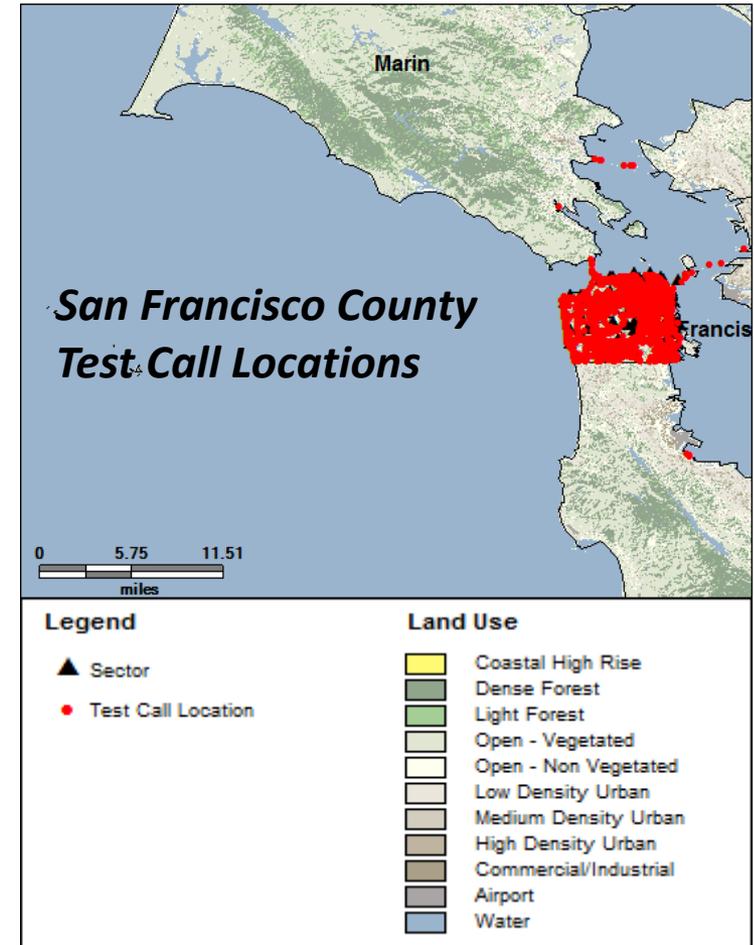
San Francisco City and County

# Calls	67% Error	90% Error	Conf. Int.	Yield%
6110	21	39	[22, 39] @ 90.02 %	97.23 %



San Francisco City and County

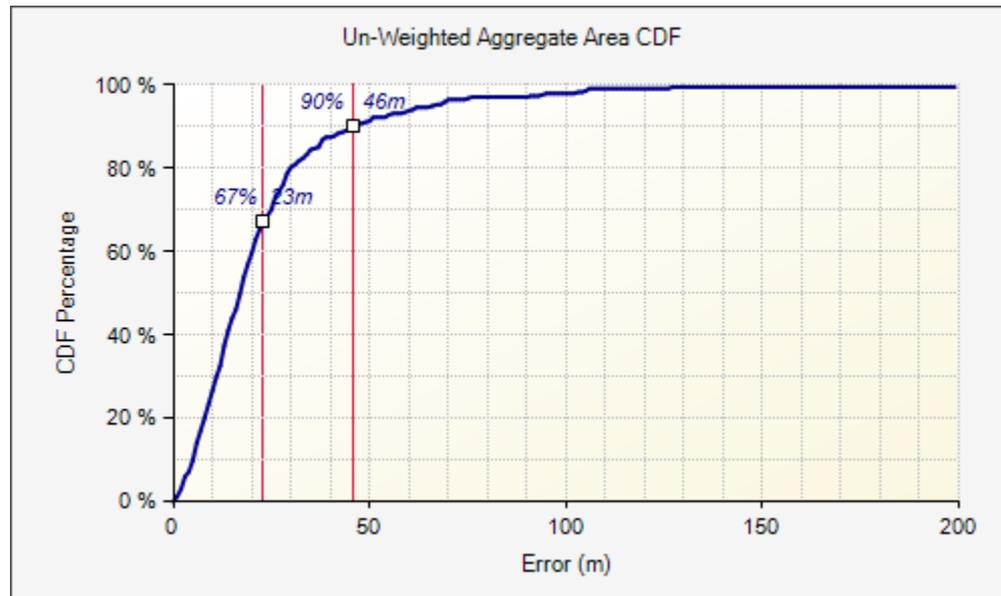
Land Use Type	# Calls	% of Valid Calls	67% Error	90% Error	Land Use %
Medium Density Urban	1943	31.80 %	21	38	17.42 %
Low Density Urban	1609	26.33 %	20	34	20.05 %
Commercial /Industrial	1041	17.04 %	23	44	6.75 %
Open - Non Vegetated	656	10.74 %	23	42	6.95 %
Open - Vegetated	389	6.37 %	19	32	7.23 %
Dense Forest	89	1.46 %	25	53	4.41 %
High Density Urban - City Center	65	1.06 %	41	81	0.25 %
Light Forest - Shrub/Scrub Vegetation	33	0.54 %	22	31	1.17 %
Water	30	0.49 %	47	111	35.78 %



Ventura County

(Ventura Co Sheriff's Office included)

# Calls	67% Error	90% Error	Conf. Int.	Yield%
334	23	46	[26, 48] @ 90.04 %	93.04 %

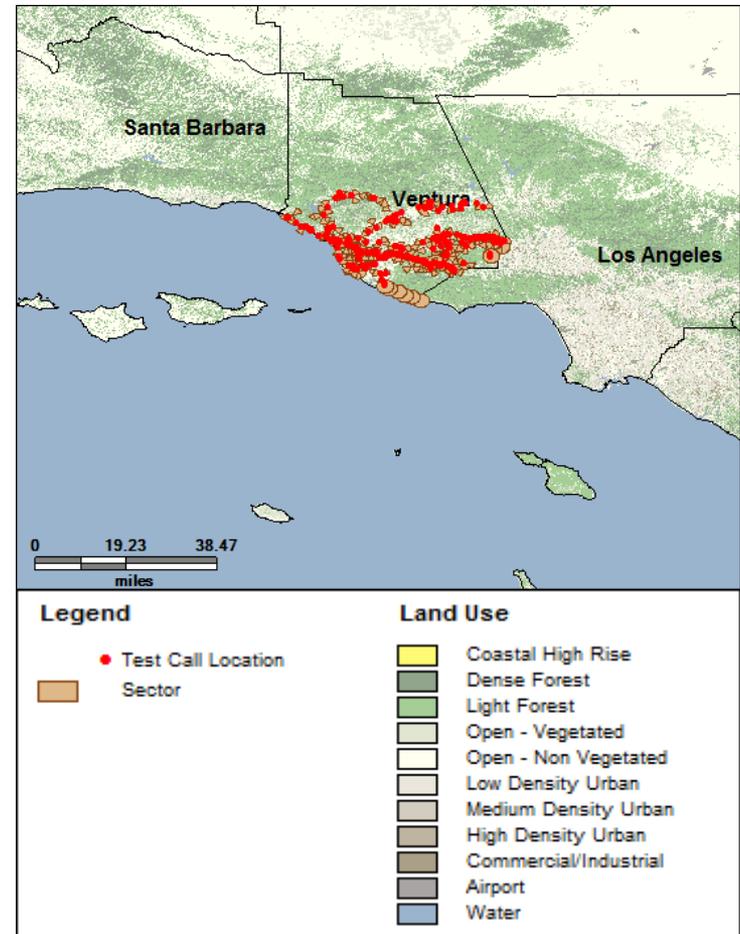


Ventura County

(Ventura Co Sheriff's Office included)

Land Use Type	# Calls	% of Valid Calls	67% Error	90% Error	Land Use %
Open - Non Vegetated	194	58.08 %	24	43	17.15 %
Low Density Urban	44	13.17 %	20	42	4.11 %
Light Forest - Shrub/Scrub Vegetation	40	11.98 %	21	50	37.10 %
Open - Vegetated	27	8.08 %	29	51	15.31 %
Commercial /Industrial	9	2.69 %	28	55	0.56 %
Medium Density Urban	7	2.10 %	20	31	0.17 %
Dense Forest	6	1.80 %	38	236	11.67 %
Water	3	0.90 %	60	60	13.85 %

Ventura County Test Call Locations



Additional Information on E9-1-1 Call Processing

- Bidding for Phase I Location Information
- Bidding for Phase II Location Information

Bidding for Phase I Location Information

- The wireless network makes Phase I (cell site/sector) location information available at the Mobile Positioning Center (“MPC”).
- Phase I location information is typically available at the same time as the initial E9-1-1 voice call to the PSAP.
- The PSAP must then retrieve the Phase I location information from the MPC using the Emergency Services Routing Key (“ESRK”) associated with the wireless call.
- The PSAP must affirmatively “bid” for Phase I location information, either manually or automatically, depending on PSAP capability and configuration. This is generally known as the “initial bid.”
- The PSAP can determine the Class of Service (“COS”) of the call, as it is displayed on their screen.

Bidding for Phase II Location Information

- The wireless network calculates more accurate Phase II location information and makes it available at the MPC.
- Phase II location information calculation at the PDE generally takes 15–20 seconds, but could take up to 30 seconds or more, and will not be available to the PSAP until it is calculated.
- The PSAP must then retrieve the Phase II location information from the MPC using the ESRK associated with the wireless call.
- The PSAP must affirmatively “bid” for Phase II location information, either manually or automatically, depending on PSAP capability and configuration. This is generally known as the “re-bid.”
- If necessary, the PSAP can “re-bid” multiple times, but should wait at least thirty seconds between each attempt to allow the system time to calculate.
- The PSAP can determine the COS of the call, as it will be refreshed and displayed on their screen with the re-bid.