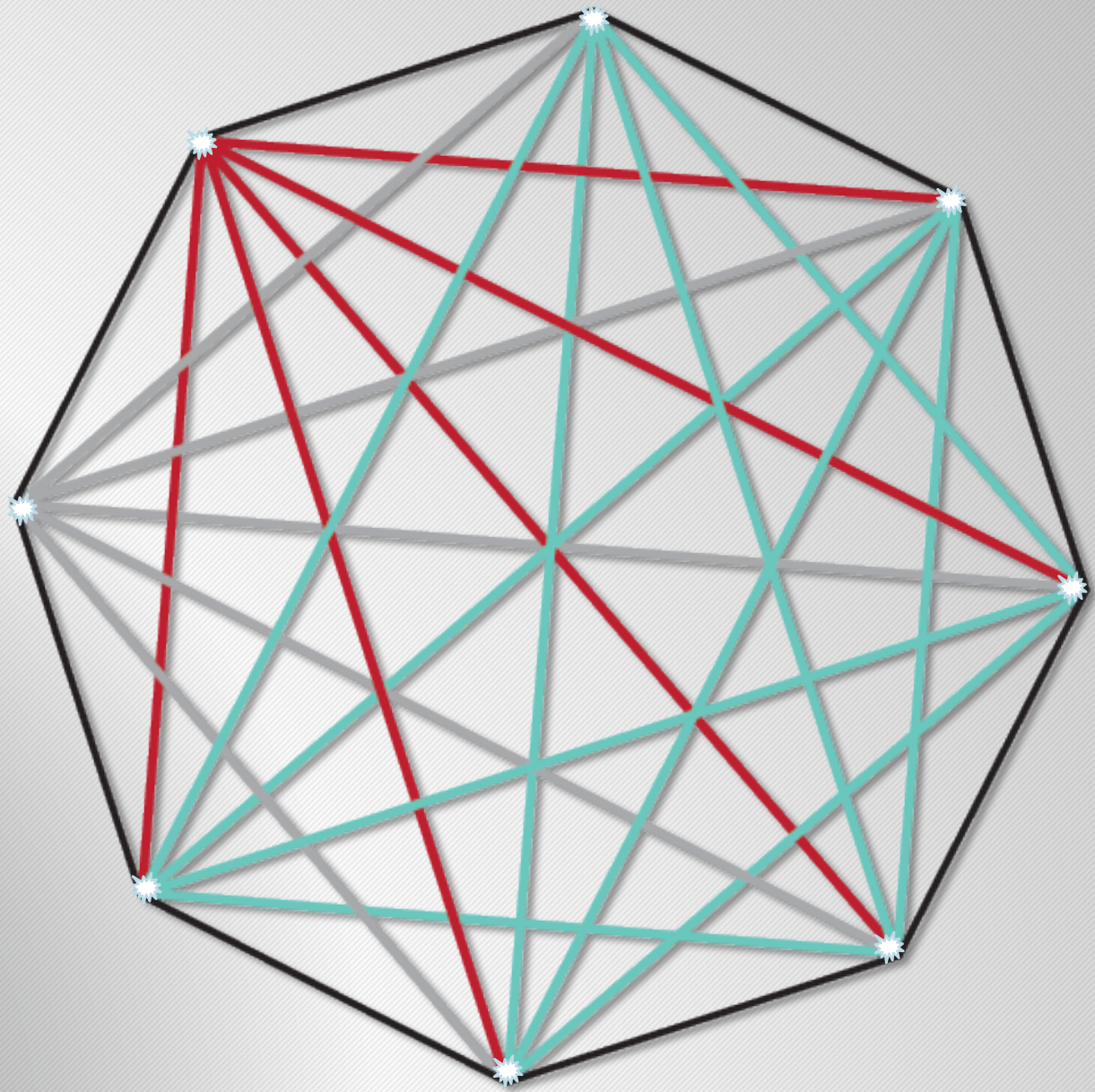

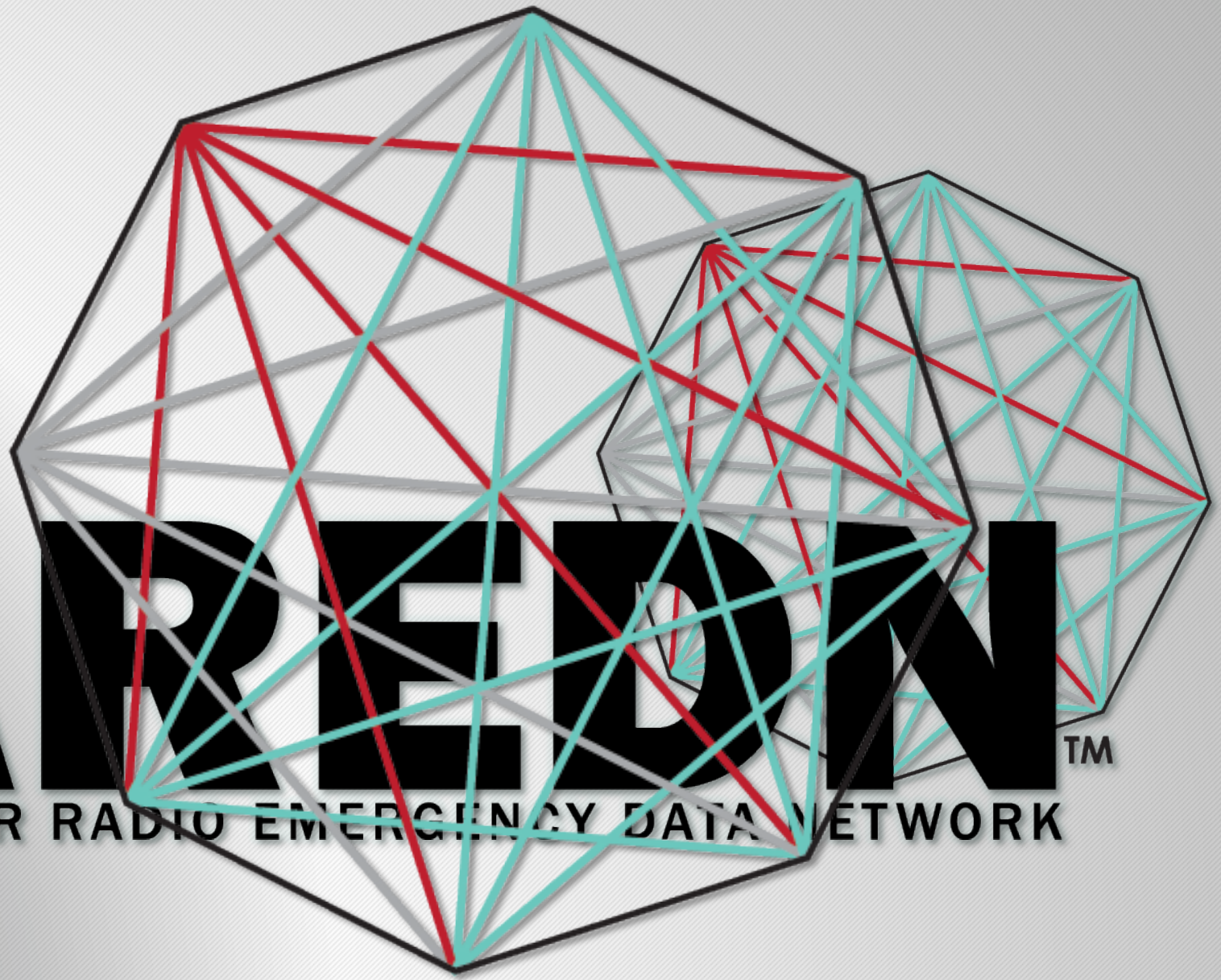

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Network Planning

Hamvention 2017 – Booth 1001

Greene County Fairgrounds, Xenia, OH

May 19 - 21, 2017

Identify

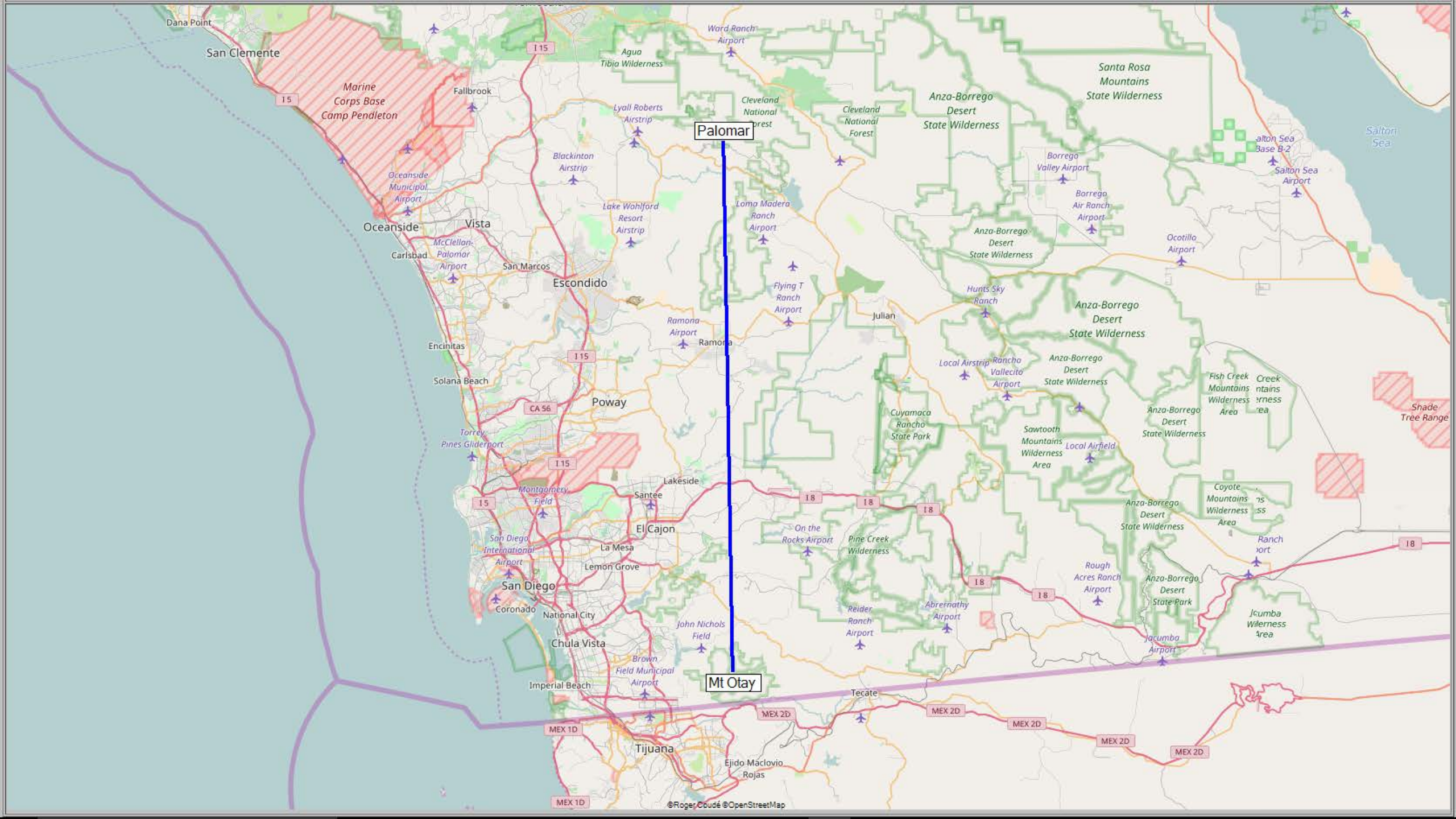
- Required coverage area (ex: San Diego County)
- Specific locations requiring access (ex: Escondido High School)
- Suitably elevated locations for the “backbone” (RM Link Analysis – Palomar to Otay)

Palomar to Otay 3.5GHz*

Palomar (1)			(2) Mt Otay		
Latitude	33.309816	°	Latitude	32.600818	°
Longitude	-116.855457	°	Longitude	-116.840868	°
Ground elevation	1693.4	m	Ground elevation	1025.9	m
Antenna height	10.0	m	Antenna height	10.0	m
Azimuth	179.01 TN | 167.21 MG	°	Azimuth	359.01 TN | 347.35 MG	°
Tilt	-0.84	°	Tilt	0.13	°

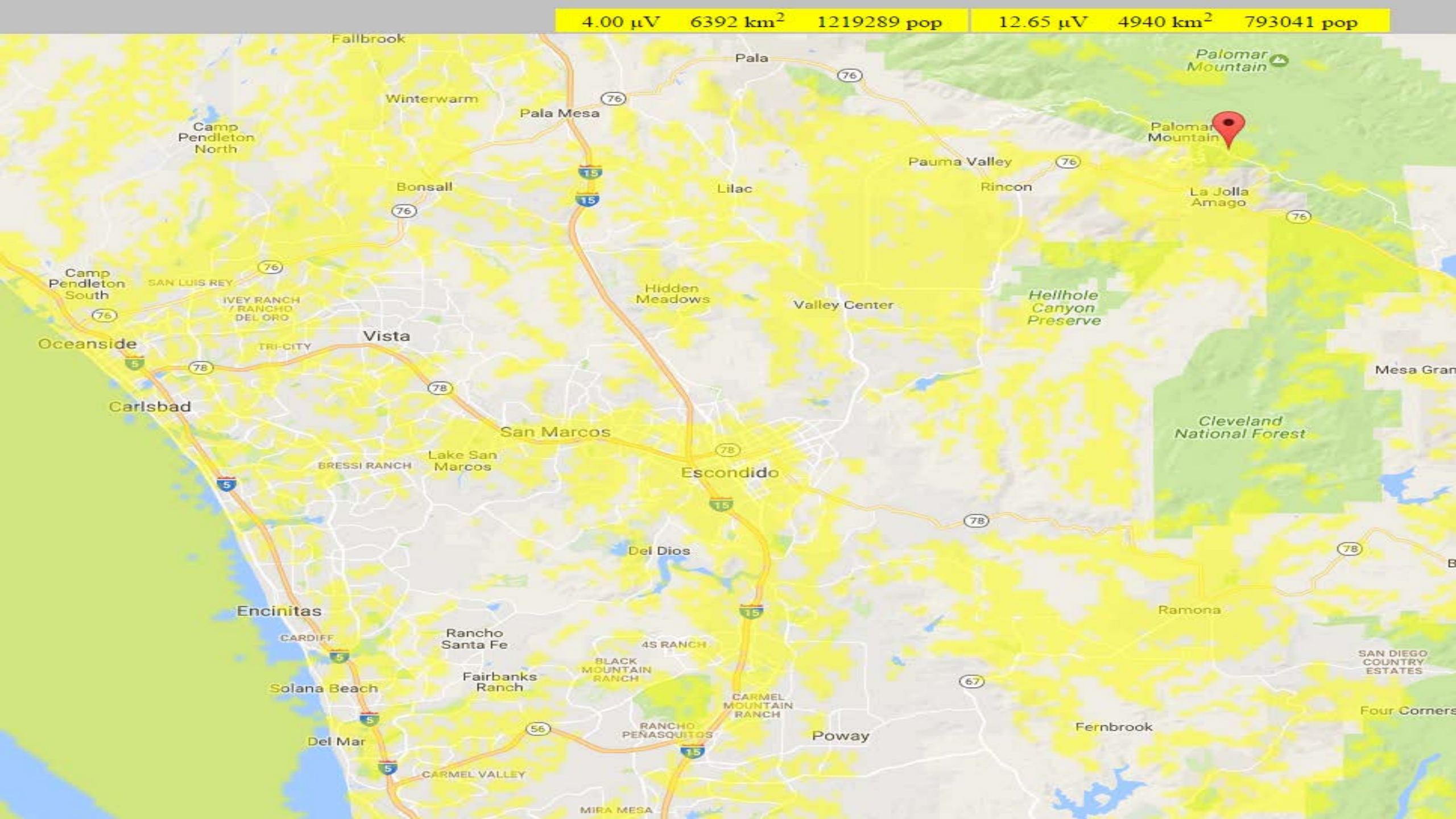
Radio system			Propagation		
TX power	22.43	dBm	Free space loss	141.22	dB
TX line loss	0.50	dB	Obstuction loss	-0.38	dB
TX antenna gain	26.00	dBi	Forest loss	1.00	dB
RX antenna gain	26.00	dBi	Urban loss	0.00	dB
RX line loss	0.50	dB	Statistical loss	6.36	dB
RX sensitivity	-94.96	dBm	Total path loss	148.20	dB

Performance		
Distance	**78.849**	**km**
Precision	39.4	m
Frequency	3500.000	MHz
Equivalent Isotropically Radiated Power	62.092	W
System gain	168.39	dB
Required reliability	70.000	%
Received Signal	-74.77	dBm
Received Signal	40.89	µV
Fade Margin	**20.19**	**dB**


Palomar
Mt Otay
Dana Point
San Clemente
Marine Corps Base Camp Pendleton
Fallbrook
Oceanside
Vista
Carlsbad
San Marcos
Escondido
Encinitas
Solana Beach
Poway
Lakeside
Santee
El Cajon
La Mesa
Lemon Grove
San Diego
Coronado
National City
Chula Vista
Imperial Beach
Tijuana
Ejido Maclovio Rojas
Tecate
Julian
Ramona
Santa Rosa Mountains State Wilderness
Anza-Borrego Desert State Wilderness
Cleveland National Forest
Agua Tibia Wilderness
Pine Creek Wilderness
Cuyamaca Rancho State Park
Sawtooth Mountains Wilderness Area
Fish Creek Mountains Wilderness Area
Coyote Mountains Wilderness Area
Jacumba Wilderness Area
Shade Tree Range
Salton Sea
Word Ranch Airport
Lyall Roberts Airstrip
Blackinton Airstrip
Oceanside Municipal Airport
Lake Wohlford Resort Airstrip
McClellan-Palomar Airport
Loma Madera Ranch Airport
Flying T Ranch Airport
Ramona Airport
Torrey Pines Gliderport
Montgomery Field
San Diego International Airport
Brown Field Municipal Airport
John Nichols Field
On the Rocks Airport
Reider Ranch Airport
Abernathy Airport
Rough Acres Ranch Airport
Jacumba Airport
Borrego Valley Airport
Borrego Air Ranch Airport
Salton Sea Airport
Ocotillo Airport
Hunts Sky Ranch
Local Airstrip
Rancho Vallecito Airport
Local Airfield
I 15
I 5
I 8
CA 56
MEX 1D
MEX 2D
©Roger Coudé ©OpenStreetMap

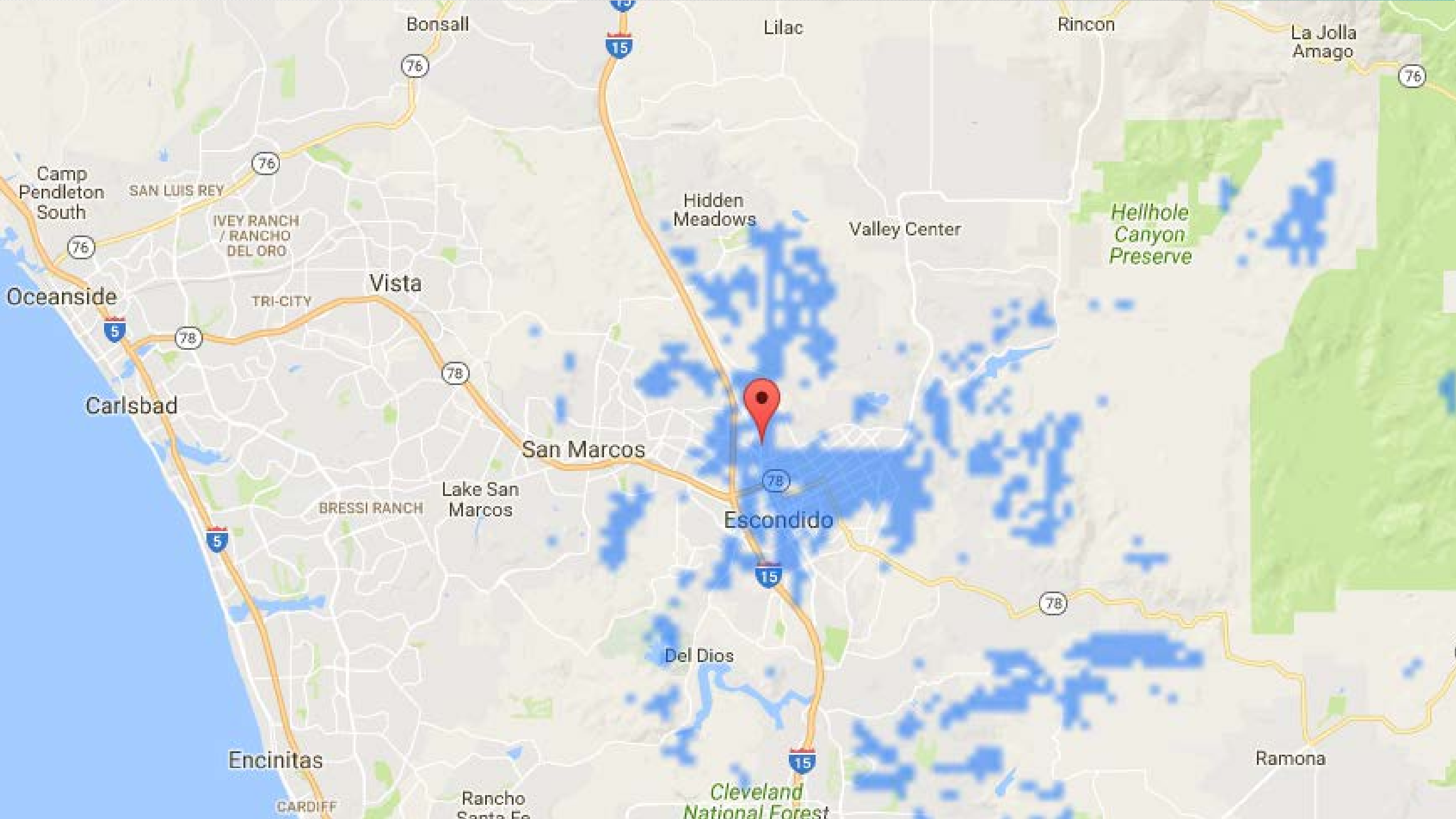
Determine

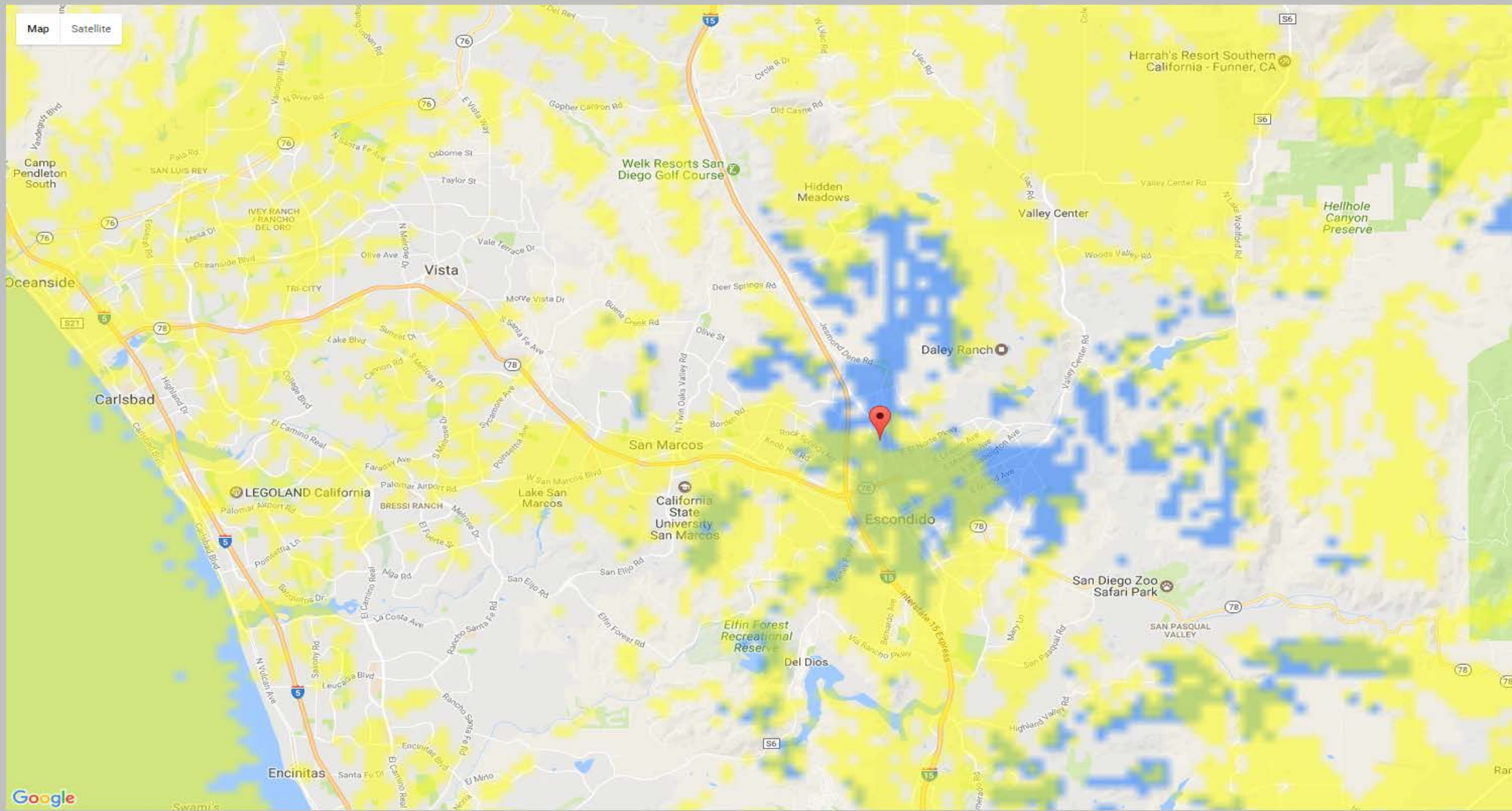
- Specific locations with direct backbone access (RM Coverage Analysis)


4.00 µV 6392 km² 1219289 pop
12.65 µV 4940 km² 793041 pop
Fallbrook
Pala
Palomar Mountain
Winterwarm
Pala Mesa
Camp Pendleton North
Bonsall
Lilac
Pauma Valley
Rincon
La Jolla Amago
Camp Pendleton South
SAN LUIS REY
IVEY RANCH / RANCHO DEL ORO
Hidden Meadows
Valley Center
Hellhole Canyon Preserve
Oceanside
TRI-CITY
Vista
Carlsbad
San Marcos
Lake San Marcos
BRESSI RANCH
Escondido
Cleveland National Forest
Del Dios
Encinitas
CARDIFF
Rancho Santa Fe
4S RANCH
BLACK MOUNTAIN RANCH
Fairbanks Ranch
Solana Beach
CARMEL MOUNTAIN RANCH
RANCHO PEÑASQUITOS
Del Mar
Poway
Ramona
Fernbrook
SAN DIEGO COUNTRY ESTATES
CARMEL VALLEY
MIRA MESA

Determine

- Suitable “relay” locations (RM Overlapping Coverage Analysis)


Bonsall
Lilac
Rincon
La Jolla
Amago
Camp
Pendleton
South
SAN LUIS REY
IVEY RANCH
/ RANCHO
DEL ORO
Hidden
Meadows
Valley Center
Hellhole
Canyon
Preserve
Oceanside
TRI-CITY
Vista
Carlsbad
San Marcos
Lake San
Marcos
BRESSI RANCH
Escondido
Del Dios
Encinitas
CARDIFF
Rancho
Cleveland
National Forest
Ramona
76
78
5
15


Map
Satellite
Camp Pendleton South
SAN LUIS REY
IVEY RANCH / RANCHO DEL ORO
Oceanside
TRI-CITY
Vista
Welk Resorts San Diego Golf Course
Hidden Meadows
Harrah's Resort Southern California - Funner, CA
Valley Center
Hellhole Canyon Preserve
Daley Ranch
Carlsbad
LEGOLAND California
BRESSI RANCH
San Marcos
Lake San Marcos
California State University San Marcos
Escondido
San Diego Zoo Safari Park
SAN PASQUAL VALLEY
Elfin Forest Recreational Reserve
Del Dios
Encinitas
Google

Centre Site	Palomar-Andre
Antenna Height (m above ground)	2
Antenna Type	AM-2G15-120-Vpol
Antenna Azimuth (°)	210
Antenna Tilt (°)	-2
Antenna Gain (dBi)	15
Mobile Antenna Height (m)	2
Mobile Antenna Gain (dBi)	21
Description	Palomar Coverage*
Frequency (MHz)	2310
Tx power (Watts)	0.25
Tx line loss (dB)	0.5
Rx line loss (dB)	0.5
Rx threshold (µV)	4
Required reliability (%)	70
Strong Signal Margin (dB)	10
Strong Signal Color	FFFF00
Weak Signal Color	FFFF00
Opacity (%)	50
Maximum range (km)	100
Rendering	Low resolution (Fast)
Use land cover	✔
Use two rays	✔

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Contact Info

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