



Simulcast Radio Equipment

Project Status Update

December 8, 2009



Simulcast Project History

1. Requirements confirmed January – March 2007
2. Request For Information (RFI) released May 1, 2007
3. Request For Proposal (RFP) released August 14, 2007
4. Vendor proposals received October 16, 2007
5. Motorola selected January 25, 2008
6. Board of Supervisors Approval May 13, 2008
7. Purchase Orders Released June 25, 2008
8. Phase I conducted July 22, 2008 - October 30, 2009
9. Phase II begins December 16, 2009



Radio System Comparison

1. Current radio system

- Simplex
- Transmit from one single selectable site at a time
- Voted repeaters
- Radio coverage doesn't meet Sheriff and Fire operational requirements

2. New radio system

- Repeated (half-duplex)
- Simulcast
- Voted repeaters
- Radio coverage designed to meet Sheriff and Fire operational requirements
- Additional simplex capability retained for interoperability, redundancy, expansion, and service requests (F2)

Note: simulcast audio signal transport required new microwave infrastructure



Simulcast Phase I (complete)

System Design

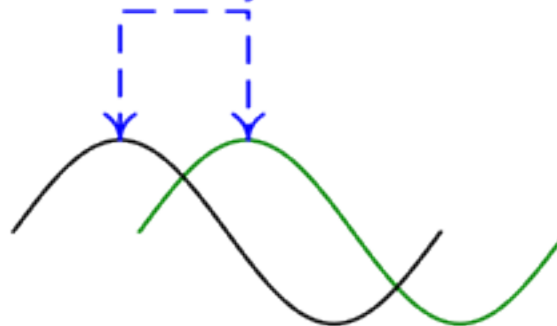
- Performed RF coverage engineering
- Evaluated sites (physical inspections & written reports of deficiencies requiring mitigation)
- Designed Sheriff and Fire radio systems
- Determined equipment space requirements
- Developed implementation plans and schedule
- Finalized system options & costs



What is Simulcast?

- Contraction of simultaneous broadcast
- Provides concurrent transmission of the same modulation at the same frequency from multiple radio sites
- Audio must be synchronized between all sites (modulation, amplitude, phase & frequency)

Phase Delay $\leq .000001$ sec





Simulcast Budget Update

County of Ventura Contract #5662 Simulcast Radio Equipment Budget Summary			
Cost Item Description	IT Services/ Sheriff's Cost	Fire District Cost	Total Cost
Phase I Services	\$424,684	\$524,601	\$949,285
Simulcast Radio Equipment	\$1,879,292	\$604,348	\$2,483,639
Phase II Services	\$928,082	\$3,464,699	\$4,392,781
Remaining Approved Contingency Funds	\$115,091	\$0	\$115,091
Total Approved Simulcast Budget	\$3,347,149	\$4,593,647	\$7,940,796

- 12% of the project budget expended on phase I
- Revised pricing reflects Motorola's discounts of \$1,067,000



Inter-Agency Joint Venture Support

1. Executive Steering Committee
 - IT Services
 - Sheriff's Department
 - Fire District
2. GSA/Procurement Services
3. County Counsel
4. Auditor Controller's Office
5. Simulcast Project Team



Simulcast Phase II

System Implementation

- Manufacture, install, test and optimize the equipment
- Integrate with Sheriff and Fire radio switches & voter receive systems
- Synchronize reprogramming of all subscriber radios (County task)
- Narrow band (County task)



Simulcast Schedule

- Dependant upon completion of incremental site improvements (agenda item #37)
- Estimated completion 12 months post-incremental site improvements



Questions



Simulcast Design Reference Pages



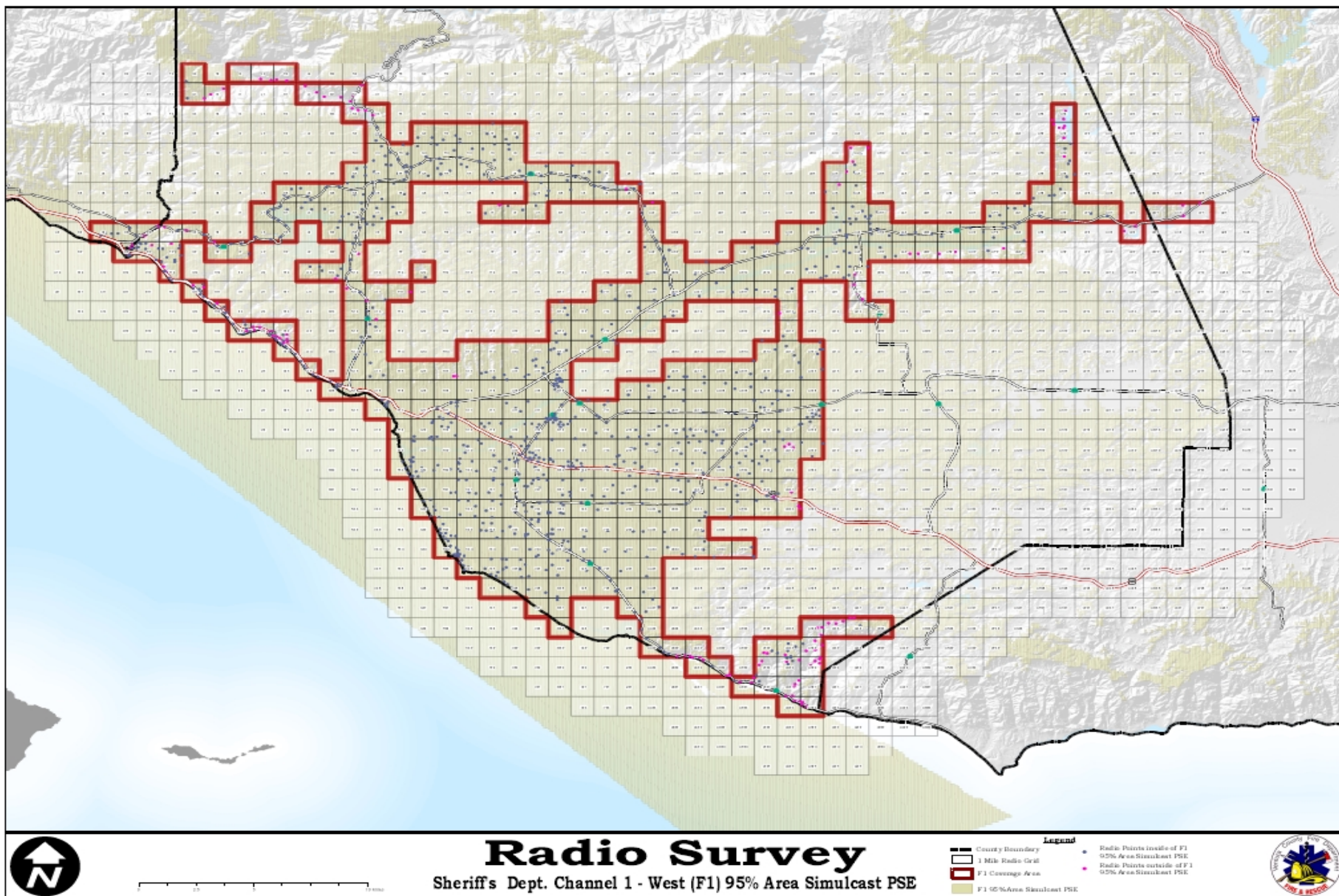
Final Simulcast Design – Transmit Sites

	<i>Simulcast</i>						<i>Non Simulcast</i>		
	Fire Tx / Rx				Sheriff Tx / Rx		Fire Tx/Rx	Sheriff Tx/Rx	
Radio Sites	156.065 / 156.065 Dispatch	154.415 / 155.73 CW #1 (West)	153.875 / 158.805 CW #2 (East)	155.985 / 154.725 CW #3 (Central)	151.13 / 155.76 F1 (West)	156.15 / 153.995 F3 (East)	154.325 / 155.835 Backup	155.535 / 158.79 F2 (ServRq)	159.21 / 159.21 F4 (North)
Pt. Mugu	X	X	X	X	Rx		X	X	Rx
Hall Mtn.	X	X	X	X	X		X	X	Rx
Red Mtn.	X	X	X	X	X		X	X	X
Rincon peak	X	X	X	X	X		X	X	X
Sisar Peak	X	X	X	X	X		X	X	X
South (Ventura County Tower)	X	X	X	X	X	X	X	X	X
Torrey	X	X	X	X	X	X	X	X	X
Santa Susana Pass	Rx	X	X	X		Rx	X	X	Rx
Mt. McCoy		X	X	X					
Rasnow peak	X	X	X	X		X	X	X	X
Castro Peak	X	X	X	X		X	X	X	X
Rocketdyne Mtn.	X	X	X	X		X	X	X	X
Laguna Peak	X	X	X	X	X	X	X	X	X
Number of Tx/Rx Radios	11	13	13	13	7	6	12	12	9
X = Transmit & Receive Base Radio									
Rx = Receive only Radio									
	X = Transmit only Radio								



Coverage, Sheriff West Channel (F1)

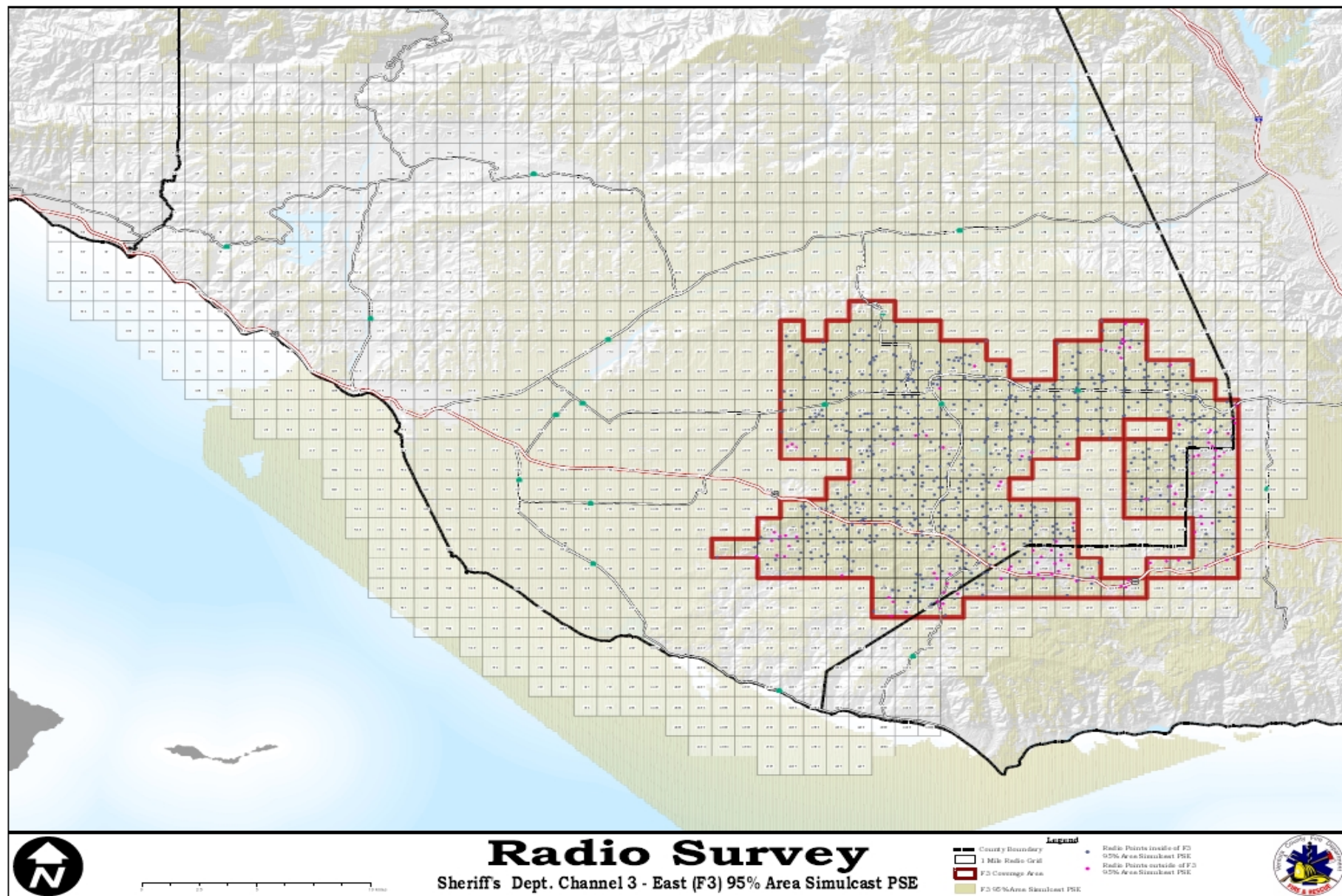
Design = 95% On-Street, Test Points = 84%





Coverage, Sheriff East Channel (F3)

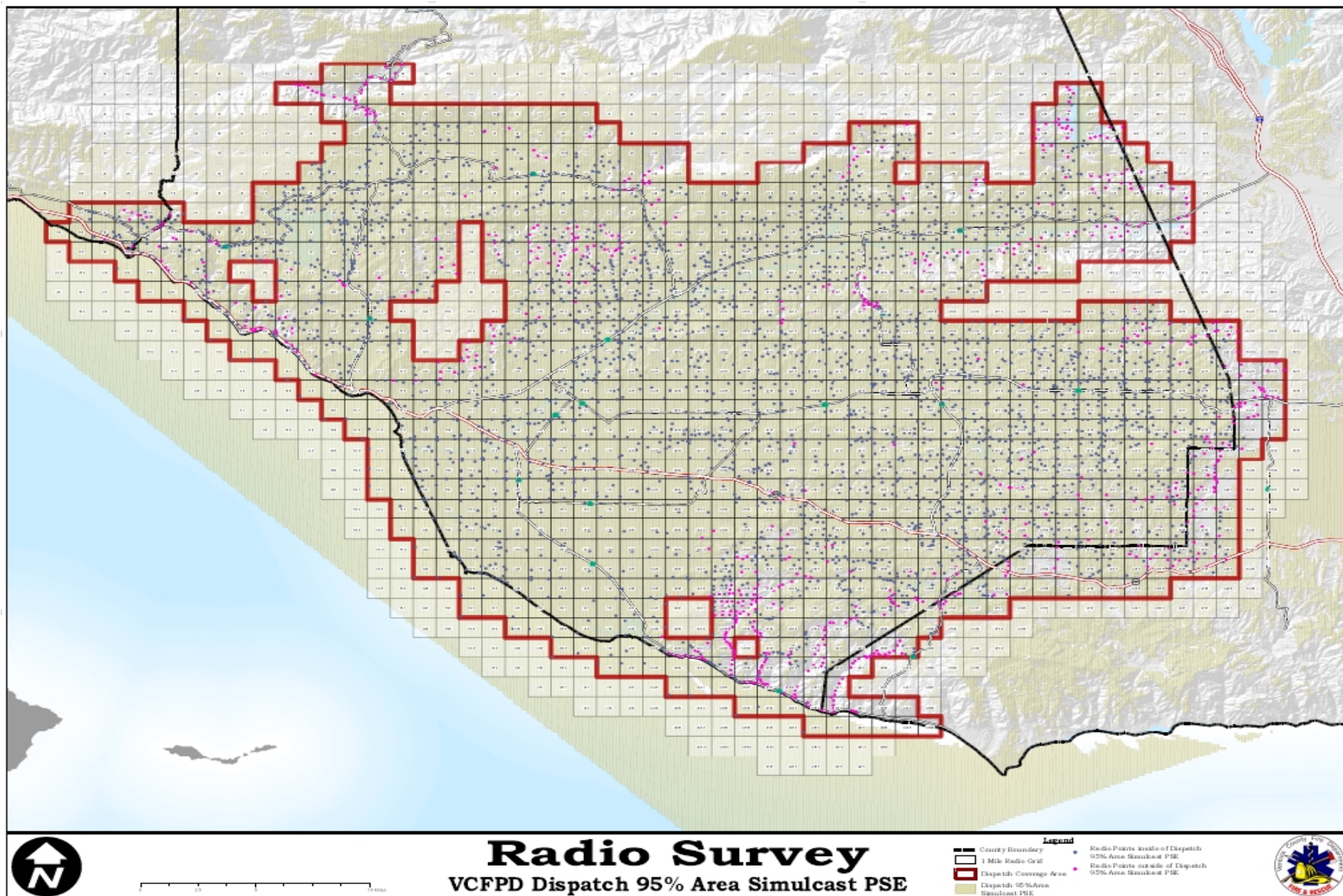
Design = 95% On-Street, Test Points = 84%





Coverage, All Four Fire Channels

Design = 95% On-Street, Test Points = 80%





Final Simulcast Design – Receive Sites

	<i>Simulcast</i>						<i>Non Simulcast</i>		
	Fire Tx / Rx				Sheriff Tx / Rx		Fire Tx/Rx	Sheriff Tx/Rx	
Radio Sites	156.055 / 156.055 Dispatch	154.415 / 155.73 CW #1 (West)	153.875 / 158.805 CW #2 (East)	155.985 / 154.725 CW #3 (Central)	151.13 / 155.76 F1 (West)	156.15 / 153.995 F3 (East)	154.325 / 155.835 Backup	155.535 / 158.79 F2 (ServRq)	159.21 / 159.21 F4 (North)
KBEH-South (KBEH Tower)		Rx	Rx	Rx	Rx	Rx	Rx	Rx	
FS 25	Rx	Rx	Rx	Rx	Rx		Rx	Rx	Rx
FS 46	Rx	Rx	Rx	Rx			Rx	Rx	Rx
Tarantula Hill	Rx	Rx	Rx	Rx		Rx	Rx	Rx	Rx
Malibu	Rx	Rx	Rx	Rx			Rx		
Kilburn	Rx	Rx	Rx	Rx		Rx	Rx		
Camrosa Water Tank	Rx	Rx	Rx	Rx	Rx	Rx	Rx	Rx	Rx
Grissom Tanks	Rx	Rx	Rx	Rx		Rx	Rx	Rx	Rx
Saticoy Tower	Rx	Rx	Rx	Rx	Rx		Rx	Rx	Rx
Piru Campground	Rx	Rx	Rx	Rx	Rx		Rx		
Matilija Dam/Canyon					Rx				
Station 20	Rx	Rx	Rx	Rx	Rx		Rx	Rx	Rx
Station 27	Rx	Rx	Rx	Rx	Rx		Rx	Rx	Rx
Station 28	Rx	Rx	Rx	Rx			Rx		
Station 31	Rx	Rx	Rx	Rx		Rx	Rx	Rx	Rx
Station 32	Rx	Rx	Rx	Rx		Rx	Rx	Rx	Rx
Station 33	Rx	Rx	Rx	Rx		Rx	Rx	Rx	Rx
Station 37	Rx	Rx	Rx	Rx		Rx	Rx	Rx	Rx
Station 40	Rx	Rx	Rx	Rx		Rx	Rx	Rx	Rx
Station 52	Rx	Rx	Rx	Rx	Rx		Rx	Rx	Rx
Station 53	Rx	Rx	Rx	Rx	Rx		Rx	Rx	Rx
Station 55	Rx	Rx	Rx	Rx	Rx		Rx	Rx	Rx
Station 56					Rx			Rx	Rx
Number of Rx Radios	21	21	21	21	13	11	21	18	20