

Communications Refresher and Radio Basics

for

Cupertino Community Volunteers

March 14, 2024

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Topics for tonight

1. Welcome
2. Volunteer Overview
3. How Cupertino volunteers use radios
4. Radio best practices
5. Radio operations basics
6. Field references
7. What's next?

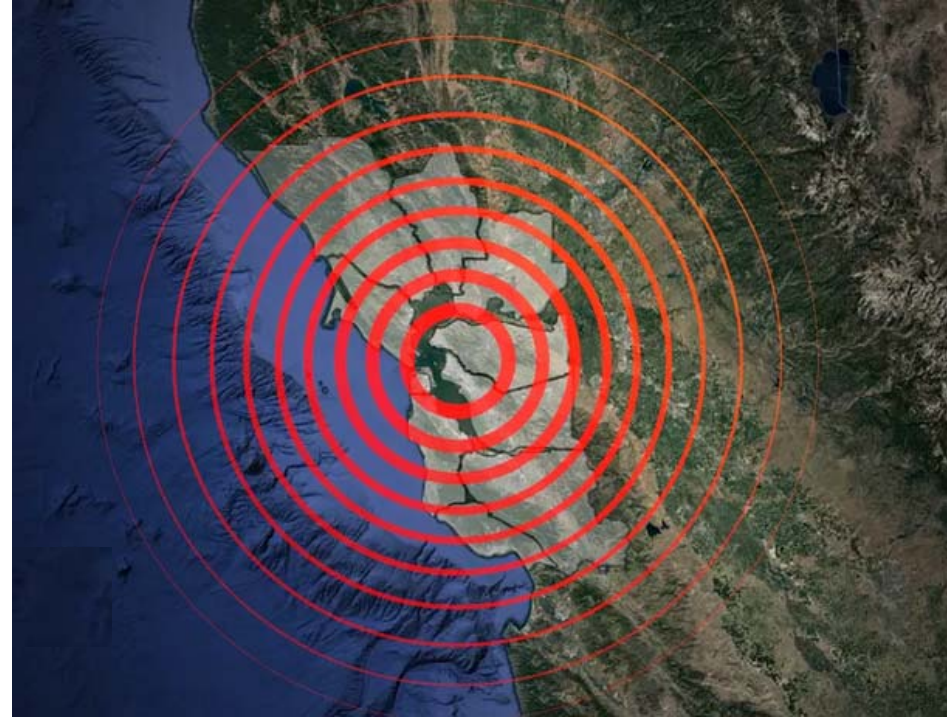


What would you do tomorrow if ...

... the bay area experiences a major earthquake that damages homes in your neighborhood and leaves you without water, power, and/or telephone?

FYI... the USGS predicts that within the next 30 years, the probability for an earthquake occurring in the San Francisco region is:

- 72% for an earthquake measuring magnitude 6.7
- 51% for an earthquake measuring magnitude 7
- 20% for an earthquake measuring magnitude 7.5



Ref: <https://www.usgs.gov/faqs/what-probability-earthquake-will-occur-los-angeles-area-san-francisco-bay-area>



What would you do tomorrow if ...

... our community is impacted by extreme winds that knocks over trees, blacks out communities, and/or take out your phone service?



Why do we prepare for... events?

- Feeling prepared increases our confidence.
- Being prepared helps us cope with disasters when they happen.
- Taking simple actions in an emergency gives you a better sense of control.
- Volunteering is one way to help you get prepared!



Why volunteer?

- In the United States, volunteers hold up the foundation of civil society. They help their neighbors, serve their communities, and provide their expertise. No matter what kind of volunteer work you choose to do, you are contributing in invaluable ways.

How do you do this?

- *bring your experience and expertise* to whatever emergency we face
- *augment the capabilities* of local government with your training
- help *speed the recovery* after an emergency



Cupertino volunteer organizations

1. **Block Leaders** –

A neighborhood level program focused on building community cohesion and trust in order to create a more resilient Cupertino.

2. **CERT** – *Community Emergency Response Team*

Prepares residents for and responds to life-threatening events in their community.

3. **MRC** – *Medical Reserve Corps*

a specialized function within CERT, uses volunteer expertise to improve health and safety in the community and during times of emergency.

4. **CARES** – *Cupertino Amateur Radio Emergency Service*

FCC-licensed amateur radio operators who deliver backup and emergency communications for our community, city, and served agencies.



During an emergency, what's the plan?

1. Take care of yourself

- Are you OK? Are you safe?

2. Take care of your family

- Is your family OK? Do they need help or first aid?
- Are you safe at home or wherever you are? Or, should you get out now?

3. Take care of your neighbors

- Are your neighbors OK? Does anyone need help?
- Can your neighborhood handle the local problems?
- If not, what help do you need?
- And, can you call for help?



During an emergency, what's the plan?

No matter where or how you choose to volunteer, during an emergency, there are things with which the City needs your help.

Emergency Tasks	Block Leaders	Citizen Corps	CARES
Assess your neighborhood	✓	✓	✓
Report your neighborhood status	✓	✓	✓
Request additional aid	✓	✓	✓
Receive & share city information	✓	✓	✓
Render local aid		✓	✓
ARK activations		✓	✓
Light Search and Rescue		✓	
Fire Suppression		✓	
Cribbing		✓	
Neighborhood or Field to ARK comms		✓	✓
ARK or Field to Cupertino EOC comms			✓
Cupertino EOC to County EOC			✓



Where does help come from?

Emergency information flow

Neighborhoods

Lindy

Woodhill

...

Willowgrove

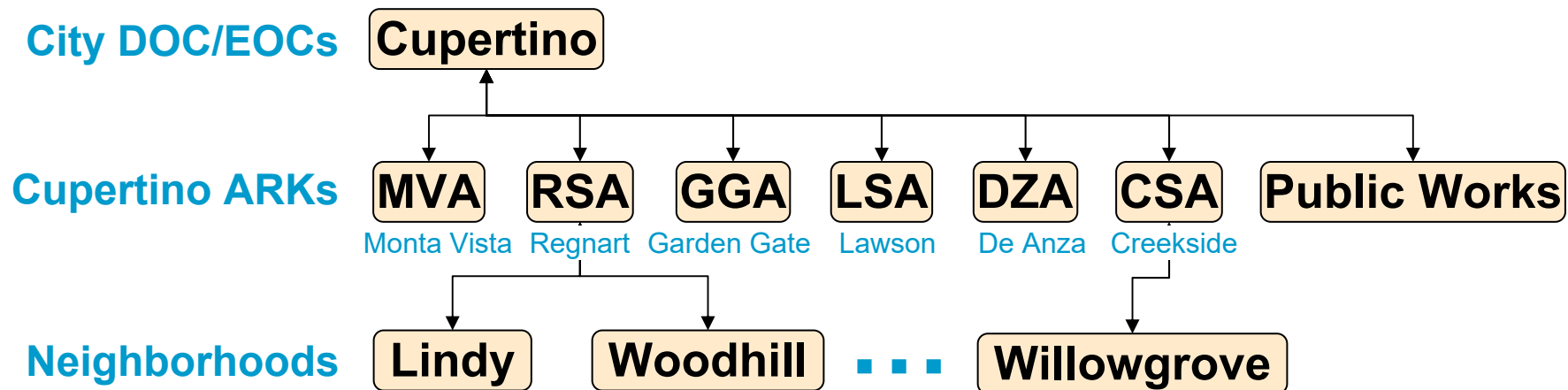
Cupertino Citizen Corps





Where does help come from?

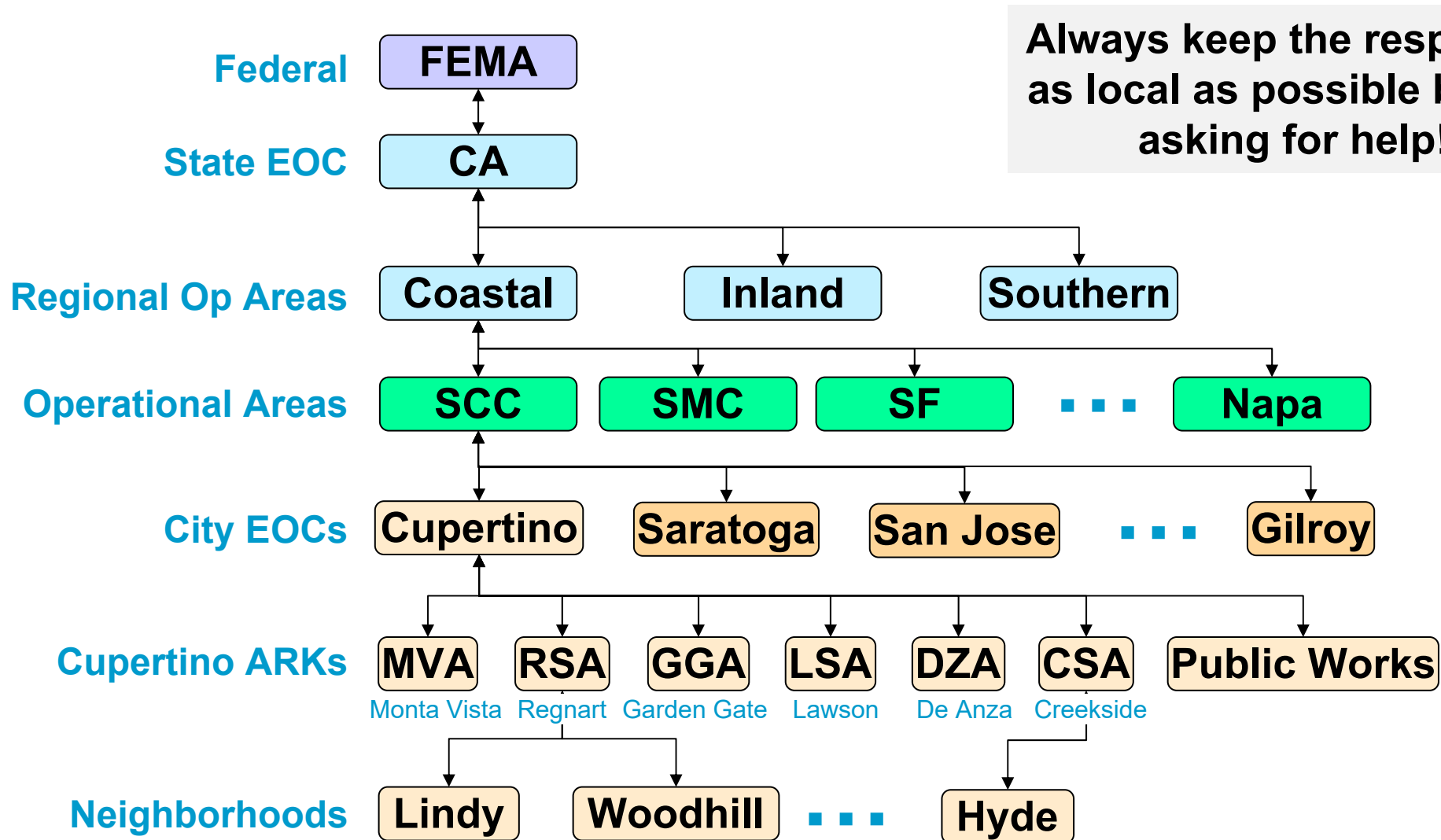
Emergency information flow





Where does help come from?

Emergency information flow



In general, ways to communicate

1. **Telephone/Cell phone** – requires the commercial phone system to be working
2. **Texting** – also requires the commercial phone system to be working
3. **Email** – requires the internet to be working
4. ***Sneaker-net*** – personally carrying information from one place to another
5. **Two-way radio** – a radio that can both transmit and receive a radio message



Two-way radio

Why

- Works when other communications methods fail
- Doesn't require the internet, wired telephone system, or commercial power
- Great for back-and-forth information exchanges
- Small and inexpensive

When to use two-way radio

- When other communications methods are unavailable or failed (internet, cellular, landline phone system), or
- When communication systems are overloaded

When not to use

- When other commercial communications methods are available



Typical radios used by volunteers

FRS (Family Radio Service)

- Inexpensive
- No FCC license
- Low transmit power (2 watts max)
- Permanently attached antenna
- Limited distance



GMRS (General Mobile Radio Service)

- Sometimes more expensive
- FCC License required
 - No test
 - License fee: \$35, good for 10 years
 - One license covers the entire family
- Higher transmit power (5-50 watts)
- Detachable antennas
- Covers greater distance



Typical radios used by volunteers

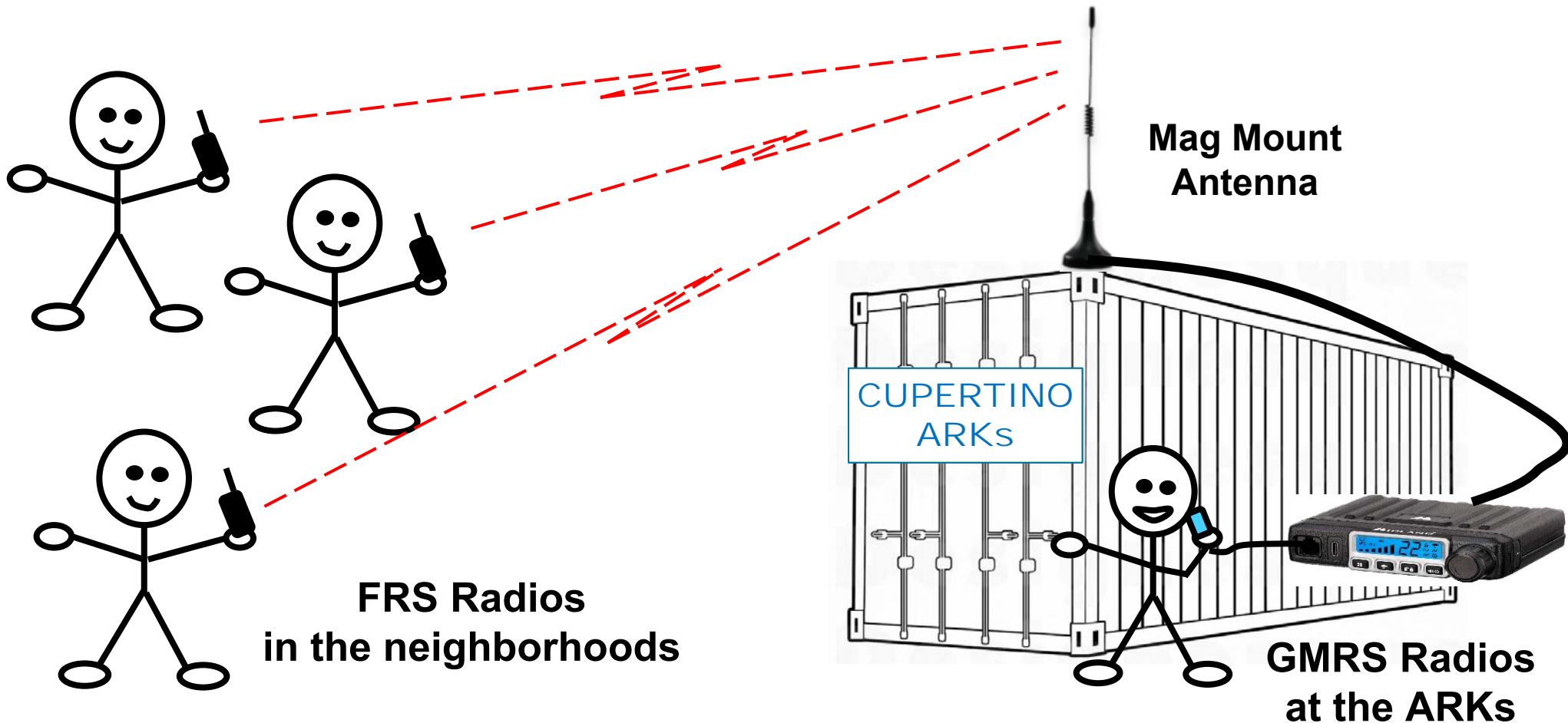
Ham Radio (Amateur Radio Service)

- Wide cost range
- License required
 - Multiple choice test
 - License fee: \$35, good for 10 years
 - License covers only you
- Even higher transmit power (5-50+ watts)
- A lot more available frequencies (channels)
- Detachable antennas
- Lots of training opportunities
 - Santa Clara County Emergency Communications



How will we use FRS and GMRS

ARKs and Field Teams

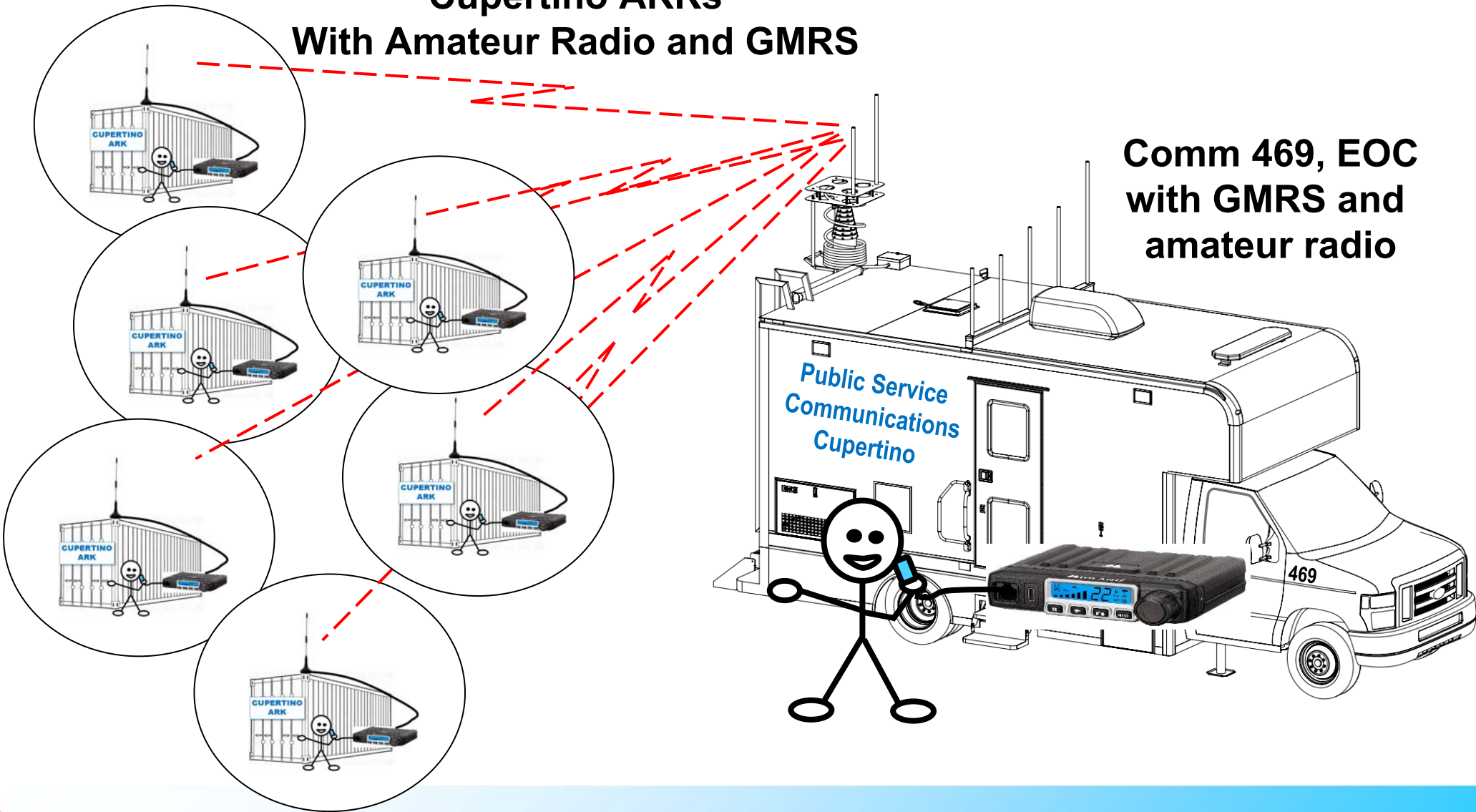


How will we use GMRS & Amateur Radio

ARKs and the EOC

Cupertino ARKs With Amateur Radio and GMRS

**Comm 469, EOC
with GMRS and
amateur radio**

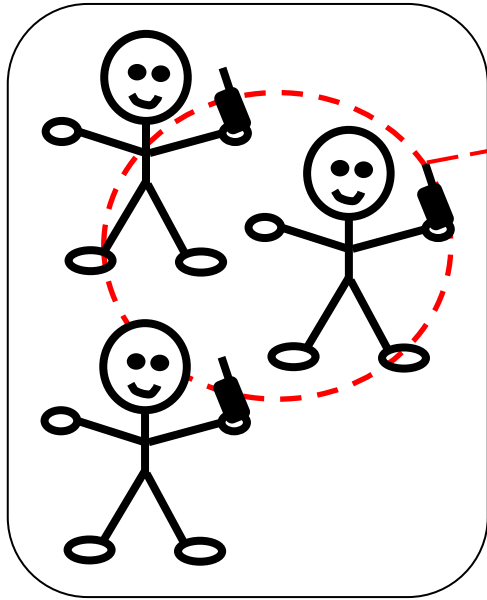


Cupertino's FRS/GMRS Channel Plan

Zone / Function		Ch/Tone	FRS	GMRS
ARK Channels 1 thru 7	Z1: Monta Vista ARK	1 / 21 (136.5Hz)	2w	5w
	Z2: Regnart ARK	2 / 22 (141.3Hz)	2w	5w
	Z3: Garden Gate ARK	3 / 23 (146.2Hz)	2w	5w
	Z4: Lawson ARK	4 / 24 (151.4Hz)	2w	5w
	Z5: DeAnza ARK	5 / 25 (156.7Hz)	2w	5w
	Z6: Creekside ARK	6 / 26 (162.2Hz)	2w	5w
	Z7: EOC, Trailer	7 / 27 (167.9Hz)	2w	5w
Neighborhood Channels 8 thru 14	CERT Tac channel 8	8 / 0	0.5w	--
	CERT Tac channel 9	9 / 0	0.5w	--
	CERT Tac channel 10	10 / 0	0.5w	--
	CERT Tac channel 11	11 / 0	0.5w	--
	CERT Tac channel 12	12 / 0	0.5w	--
	CERT Tac channel 13	13 / 0	0.5w	--
	CERT Tac channel 14	14 / 0	0.5w	--
GMRS, Rptr Channels 15 thru 22	Comm 469 Tac 15	15 / 35 (225.7Hz)	2w	50w
	CUP CERT/GMRS*	20R / 31 (192.8Hz)	2w	50w
	SJ Local Repeater	21R / 22 (141.3Hz)	2w	50w
	SJ CERT/GMRS	22R / 12 (100.0Hz)	2w	50w

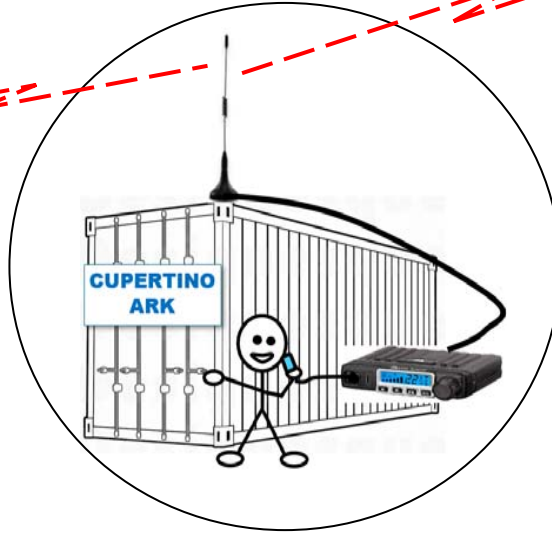


Who's on what channel?



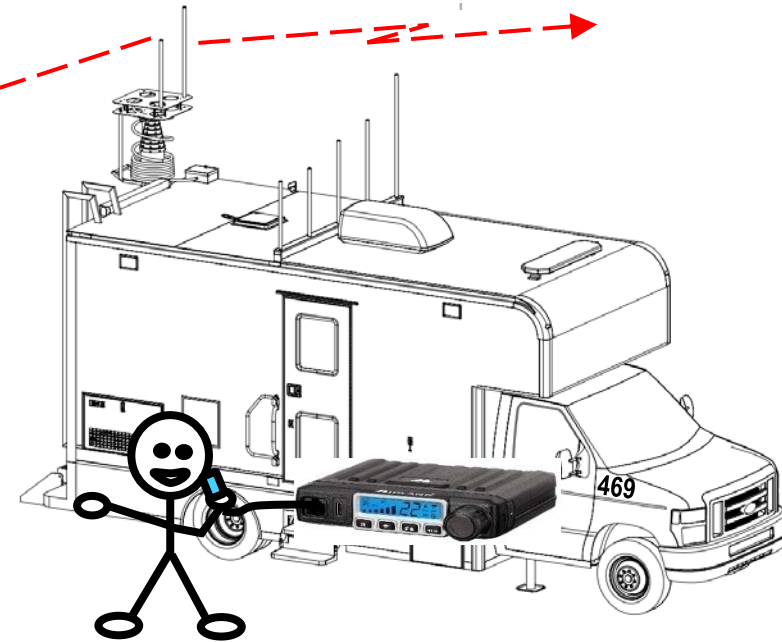
Neighborhood Teams

- Talks among your neighbors
- Coordinates the local response
- Uses FRS channels 8 – 14
- With the ARKs, channels 1 – 6



Each ARK

- Talks with local neighborhoods, individuals in the ARK zone
- Coordinates the Zone response
- Uses FRS/GMRS channels 1 – 7
- Talks to the EOC on GMRS or amateur radio



EOC/Comm 469

- Talks with the CARES Field Teams
- Talks with the EOC, SCCo EOC
- Talks with ARKs by amateur radio or by GMRS on channels 1 – 7
- Coordinates the city volunteer response



Radio Best Practices

A radio is not a telephone

- On a telephone conference call or FaceTime or Zoom, everyone can hear everyone talking at the same time.

While using a radio,

- One person talks and everyone else listens.
- When you press your Push-to-Talk (PTT) button, you can't hear anyone else.
- If two people press their PTT buttons at the same time, a “double” occurs and many if not all listeners don't hear anything that they can understand.



Radio Best Practices

Using the Radio

1. Make sure you are on the correct channel / tone.
2. PTT = Push to Talk, not Push to Think.
3. Speak slowly and clearly.
4. Keep your messages as short as possible.
5. Don't shout. If other station cannot hear you, try changing your location.
6. Use plain English... 10-codes (such as 10-4) or slang.
7. Do not pass any sensitive information like victim or patient names over the radio unless asked for the name; these are public airwaves.



Radio Operation Basics

- A **Radio Net** is a moderated conference call conducted over two-way *radio* on a specific FRS channel.
- Cupertino uses Radio Nets during emergencies for relaying messages, receiving status reports, and transmitting important information to those on the net.
- **Net Control Operator** – the person who runs the net.
- At some point, you may want to:
 1. Check in to the net
 2. Transmit status reports or request assistance
 3. Listen for, copy down, and pass on information to your neighborhood
 4. Check out of the net when you are all done



Radio Operation Basics

Making Contact

- Listen first, press & hold the PTT, take a breath, pass your message, and then release the PTT
 - *“Regnart ARK, this is Jim at Pine Brook Court checking in.”*
- Consider using tactical names, not personal names
 - *“Regnart ARK, this is Pine Brook Court checking in.”*
 - *“Regnart ARK, this is Lindy Lane with a damage report.”*
 - *“Lindy Lane, this is Team 1 with a status report.”*
- When sending a message, adding key words can help
 - *“Regnart ARK, this is Three Oaks with an emergency message.”*
- If the other station doesn't answer, wait and try again
 - They may be busy
 - Frees up the channel for others



Radio Operation Basics

1. **CHECK IN** to the local ARK Radio Net if you are at home and have a radio, or if you are assigned a task at the ARK. This does a few things:
- Lets the ARK's Net Control know who is on the Net
 - Confirms you have your radio set correctly with the correct Channel and Tone for your ARK.

If you are...	You would say...
Creekside ARK	This is Sam, Net Control at Creekside ARK. Any Zone 6 stations, check in now and say your name and location.
Bob	Creekside ARK, this is Bob at Bollinger and Miller, checking in.
Creekside ARK	OK Bob, I have you checked in.
Angie	Creekside ARK, this is Angie at the Hyde neighborhood, checking in.
Creekside ARK	Hi Angie, acknowledged.



Radio Operation Basics

- 2. CHECK OUT** of the local ARK Radio Net when you need to leave the net or are back at the ARK. This does a few things:
- Lets the ARK's Net Control know you are leaving the Net
 - Checking out does not mean that you may be done with your participation, it just that Net Control will no longer look for you on the Net.

If you are...	You would say...
Bob	Creekside ARK, this is Bob, I need to leave the net, checking out.
Creekside ARK	OK Bob, acknowledged.
Angie	Creekside ARK, this is Angie. I am back at the ARK and checking out.
Creekside ARK	OK Angie, acknowledged.



Radio Operation Basics

Message Passing

1. Listen: Make sure the frequency is clear or Net Control is not talking to someone else whom you might not hear.
2. Tell the ARK Net Control Operator that you have a message to pass. The Net Control Operator will tell you when to pass the message.
3. To pass a very short, simple messages, you send the entire message, and the receiving station may simply say “copied” or “OK” or may read the message back to you.
4. For longer messages, say the message in logical phrases of about 4 to 7 word groups, without repetitions.
5. Talk slowly. The receiving station needs to write your message down!
6. Say **Break** when pausing and release the PTT key while you wait for the receiving station to write down your message and acknowledge you.
7. Always release the PTT key when you stop talking.



Radio Operation Basics

Message Passing example #1

You are part of your neighborhood's Team 3 doing a damage assessment and observe the following in front of 132 Sunrise Circle...

What do you report?

1. Who you are
2. What is the problem
3. Where is the problem
4. What is the impact
5. What have you done so far



Radio Operation Basics

Message Passing example #1

If you are...	You would say...
Team 3	Creekside ARK, this is <u>TEAM 3</u> with a damage report. ①
Creekside ARK	OK Team 3, stand by... Ok, what is your message?
Team 3	Tree down and blocking the road ... Break. ② ④
Creekside ARK	OK, continue
Team 3	at 132 Sunrise Circle. Break. ③
Creekside ARK	OK, continue
Team 3	Public Works is on scene... End of Message ⑤
Creekside ARK	OK Team 3, I acknowledge your message.



Radio Operation Basics

Message Passing example #2

You are part of Regnart Ridge neighborhood,
Your tactical call is “Regnart 1”. All the power is out. When checking on your neighbors, you find this.



What do you report?

1. Who you are
2. What is the problem
3. Where is the problem
4. What is the impact
5. What have you done so far



Radio Operation Basics

Message Passing example #2

If you are...	You would say...
Regnart 1	Regnart ARK, this is <u>Regnart 1</u> with a damage report. ①
Regnart ARK	OK Regnart 1, stand by... Ok, what is your message?
Regnart 1	Tree fell on power lines ... Break. ②
Regnart ARK	OK, continue
Regnart 1	Closest address is 1287 Regnart Road ... Break. ③
Regnart ARK	OK, continue
Regnart 1	All power is out. No action taken. End of Message ④ ⑤
Regnart ARK	OK Regnart 1, I copy your message.



CCC Field Comm Handbook

your new best friend!

Includes

1. Contact Information
2. Radio channels, frequencies
3. Radio operation basics
4. Operating on the CERT Radio Net
5. Passing message basics
6. CCC FRS & GMRS Radios
7. Phonetic Alphabet
8. Modified Mercalli Intensity Scale

Where's the book?!

bit.ly/CCommHandbook

Cupertino Citizen Corps Field Communications Handbook

March 2022



Add this to your Go-Kit



1. Current Citizen Corps ID
2. Protective clothing
3. Safety Vest
4. Sturdy closed-toe shoes
5. Hard hat
6. Goggles
7. N95 mask
8. Whistle
9. Leather gloves
10. Personal first aid kit
11. Water and food
12. Sun block as needed
13. Clipboard
14. Pens (2)
15. Pad of 8.5" x 11" paper
16. ICS Forms: 211, 213, 214
17. Cupertino Forms: COES 105, 106
18. Flashlight and Batteries
19. AM Radio (portable)
20. FRS/GMRS Radio
21. Tape (i.e.: blue painters tape)
22. ARK Activation Handbook
- 23. CCC Field Communications Handbook**
24. Whatever else you may need



What's next?

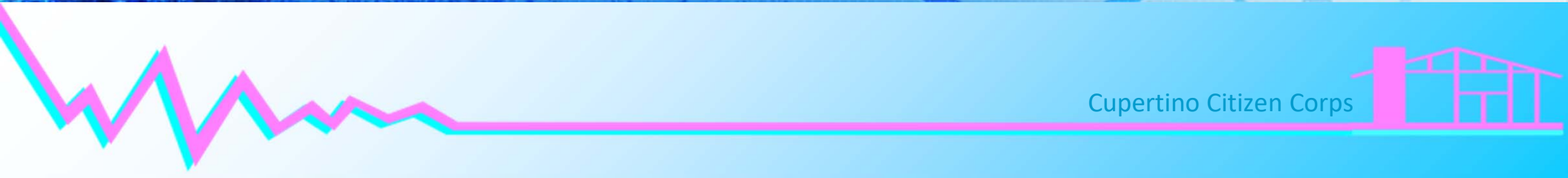
23 March, 10:00am, Monta Vista ARK

1. Come to the FRS radio hands-on session Saturday:
 - Hands-on radio refresher
 - Have a radio?
 - Bring your FRS radio with you if you own one
 - Check or update your radio your channels and tones settings
 - Do a radio check to verify it all works
 - Don't have a radio?
 - We will have some for you to try and get on the air!
 - **Pick up your copy of the...**
 1. ***CCC Field Communications Handbook***
 2. ***Cupertino ARK Activation Handbook***

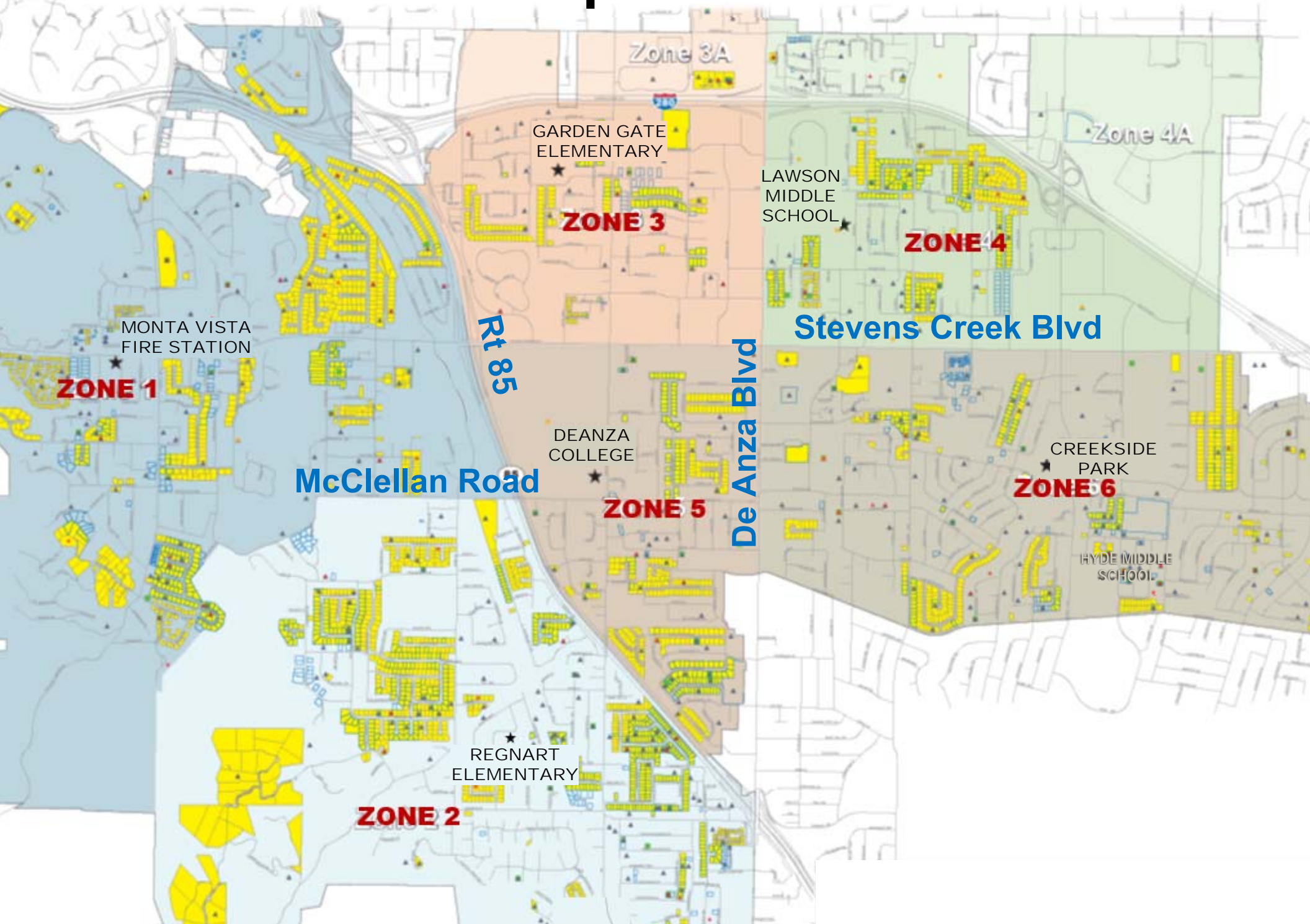


Thank you!

Any Questions?



Where am I?... Cupertino ARK Zones



Thank you!

If you have questions, comments, or feedback about this training, please email them Ken or myself at ...

Ken: kennethe@cupertino.gov

Jim: jimo@cupertino.gov

**Please join us this Saturday 23 March at Monta Vista ARK
for our FRS Hands-on session**

Finally, easy links to this material

CCC Comm Handbook... <https://bit.ly/CCommHandbook>

These slides... <https://bit.ly/2023CCommSlides>

