Date:	7 November 2014
From:	Jim Oberhofer, Emergency Coordinator, CARES
To:	Carole Atwood, Cupertino Director of Emergency Services
Subject:	Proposal, Cupertino Emergency Wireless Intranet Pilot

1. Summary

This proposal is a request for $1,000 to fund a Pilot implementation of the Cupertino Emergency Wireless Network (ARKnet). If the Pilot is successful, a recommendation and proposal would be made to expand the Pilot to a full deployment to all ARKs and other City sites as necessary.

2. Situation

Cupertino has 6 ARKs (shipping containers of emergency supplies) located throughout the city. In the event of an emergency, members of CERT, CARES, and MRC (Cupertino Citizen Corps) will converge, self-organize, and deploy into the surrounding neighborhoods to assist the community with stabilizing the situation and assisting with the recovery. Information about the response – staffing levels, reported problems, and progress to their resolution – is critical to the success of the responders. This information, when shared with the EOC, can also give the city an over-the-shoulder look at what is happening in the field.

Amateur Radio continues to be the emergency communications means of last resort for exchanging information between the EOC and the field. This will not change. However, new technologies and products are now available that can augment this information management process, thereby allowing our field responders to readily share more information with the City and other City responders with the goal of accelerating decision-making and the recovery.

3. Proposal

This proposal is for a limited implementation of an emergency network in support of the City's field responders.

3.1 Background: All 6 ARKS, the EOC, and any other designated City or Served Agency sites, would be able to connect to this city-owned emergency network. A central wireless backbone site would be established at Montebello Apartments and/or the Cypress Hotel. Client sites (ARKs, others) would connect to this backbone using exiting 802.11 wireless networking equipment and protocols.

3.2. Applications: Once the network is established, the following applications could be enabled (to name a few):
1. VoIP phone system
2. File Sharing
3. Instant Messaging
4. Web page serving and information downloads
5. Video streaming
6. End-user messaging
7. WebEOC data entry and access

3.3 Assumptions: This emergency network operates under the following assumptions:

1. The Emergency Network would always be on and operational.
2. Internet throughout the city is unavailable.
3. Telephone services – wired and wireless – are unavailable or limited.
4. The Network operates under FCC Type 15 rules (no radio or operator license required).
5. All equipment is Commercial off the Shelf. Other than configuration, no custom solution is planned.

3.4 Users: Users of the network would use the applications described above and include:

1. Cupertino Citizen Corps members who respond to the ARKs, ICP, or other requested field location.
2. Cupertino EOC staff that require information from or contact with field responders.
3. City emergency responders and staff at City sites where the network is deployed (Quinlan Center, Service Center, Traffic Department, etc.).

3.5 Pilot Sites: We recommend that a Pilot be funded that would demonstrate application items 1 through 4 above for these three sites:

1. Cupertino EOC
2. Hyde Ark, Hyde Middle School
3. Montebello Apartments (current location of the CARES 440 repeater)

4. Pilot Objectives

The objectives of the Pilot are:

- Confirm the feasibility of establishing an emergency wireless network.
- Confirm the operation of all pilot applications.
- Develop more detailed real-world network performance metrics allowing us to better evaluate other possible applications and their associated bandwidth.

5. Pilot Project Phases

The Pilot project will execute in four phases. Checkpoints would be held with the Cupertino OES Staff to evaluate the project's progress and recommend either continuing or stopping the Pilot.

Project Phase	Description
1. Requirements	- Develop the requirements that the system must meet for it to be useable and practical for the City. ***Deliverables***: (i) List of requirements, (ii) Project Data Sheet, (iii) Project Schedule, (iv) detailed solution description. ***Requirements Checkpoint***: Review the requirements and confirm the reasonableness of the Pilot.

Project Phase	Description
2. Design	• Perform Site Surveys at the Pilot locations to confirm that we have line of sight between the three locations (RF requirement). • Develop a Bill of Materials (equipment list) required to bring these 3 sites on line. All equipment will be new and of commercial quality. *NOTE:* If the full deployment is approved, then this equipment will be incorporated into the final deployment. *Deliverables:* (i) Bill of Materials, (ii) Pilot costs, (iii) schedule update. *Design Checkpoint:* Review the Pilot Cost estimates; gain approval to proceed with the equipment purchase.
3. Build	• Purchase the Equipment. We will use reputable distributors and/or local suppliers whenever possible. • Assemble and configure all equipment, application, and computer components in a designated staging area. • Test the integration of the Pilot equipment prior to deployment. *Deliverables:* (i) Assembled pilot solution, (ii) Test Plan. *Build Checkpoint:* Internal, may include City Sponsors. Confirms that the pilot solution is configured and ready to be deployed.

4. Deploy Pilot	• Install the Pilot system at the 3 locations.
	• Perform a Functional Test of the installed system and applications.
	• Schedule and present the installed solution to Cupertino OES and other City Staff; confirm that all objectives were met.
	Deliverables: (i) Operational Pilot, (ii) City-wide emergency network deployment plan (schedule, scope, resources), (iii) High level emergency network design, (iv) Recommendation for next steps.
	Deploy Checkpoint: Review the recommendation with Cupertino OES to do one of the following:
	    o Develop the proposal for a full city emergency intranet deployment, or
	    o Redo some or the entire Pilot project, or
	    o Cancel; do not proceed.

6. Pilot Schedule

1. Project Start: 17 November 2014 (assumes the Pilot is approved)
2. Requirements Checkpoint: 26 November 2014
3. Design Checkpoint: 5 December 2014
4. Build Checkpoint: 31 December 2014
5. Deploy Checkpoint: 15 January 2015

NOTE: All dates following *Project Start* will be adjusted based on the actual start of the project.

7. Funding

Funding for this project would be by Cupertino OES. Costs listed below are ***estimates only*** and will be confirmed and approved prior to any purchases are made.

Pilot	Equipment:	$1,000 (estimate)
	Labor:	$ 0; to be performed by city volunteers
Full Deployment	Equipment:	$5,000 (Rough estimate; depending on the results of site surveys of the rest of the ARK sites)
	Labor:	tbd; Need to determine if any City Service Center assistance is needed
	NOTE: This line-item is not in scope for the Pilot	

8. Potential Obstacles

- With increased capability comes increased complexity. On approval to proceed with the full deployment, one of the deliverables needs to be the plan on how the solution will ultimately be supported.
- Network equipment at the Ark Sites will be in public area. Need to address physical security of exposed components.

9. Organization Details

All work on this pilot will be performed by Cupertino Volunteers.

10. Conclusion

We believe that this Pilot, and the ultimate fully deployed project, is technically feasible. In the end, enhanced connectivity between the EOC and the ARKs, as well as between ARK and ICP sites, will result is a more effective emergency response and faster recovery.