

# ARKnet Pilot

## Summary and Recommendations

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Jim Oberhofer KN6PE  
Kenneth Finnegan W6KWF  
Judy Halchin KK6EWQ



# Background

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1. Cupertino Citizen Corps (CCC) Volunteers are important to the City's response.
  - They will converge around ARKs, self-organize, and deploy into the surrounding neighborhoods to assist the community with stabilizing the situation and assisting with the recovery.
2. The effectiveness of an emergency response is based on the quality and timeliness of the information available to first responders and those who support them.
3. With the real possibility of commercial communications overloads or outages, EOC Staff and CCC field responders will use Amateur Radio as the primary means exchanging information.
4. New technologies are now available that can augment this information sharing, thereby allowing our field responders to readily share more information with the City and other City responders with the goal of accelerating decision-making.



# The Goal

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1. Deploy the Cupertino Emergency Intranet that interconnect all ARK sites, the EOC, and other City sites are requested.
2. Support the following user groups:
  - Cupertino Citizen Corps members – respond to the ARKs, ICP, or other requested field location.
  - Cupertino EOC staff – require information from or contact with field responders.
  - City emergency responders and staff at City sites where the network is deployed (Quinlan Center, Service Center, Traffic Department, etc.).
3. Use familiar applications on the network
  - VoIP phone system
  - File Sharing
  - Instant Messaging
  - Web page serving and information downloads
  - Video streaming
  - End-user messaging
  - WebEOC data entry and access



# The Pilot Proposal

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1. Test the network with an initial pilot of 3 sites.
  - Cupertino EOC
  - Hyde Ark, Hyde Middle School
  - Montebello Apartments (current location of the CARES 440 repeater)
2. Demonstrate a limited number of applications on the network
  - VoIP phone system
  - File Sharing
  - Instant Messaging
  - Web page serving and information downloads
3. Fund the Pilot to no more than \$1,000



# Schedule

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1. Proposal	7 November	✓
2. Requirements Checkpoint	26 Nov 2014	✓
3. Design Checkpoint	5 Dec 2014	✓
4. Build Checkpoint	31 Dec 2014	✓
5. Deploy Checkpoint	15 Jan 2015	✓

**Pilot Deployment Complete!**



# The Team

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Project Manager:

Jim Oberhofer

Technical Lead:

Kenneth Finnegan

Member, Technical Staff:

Allan Gontang

Judy Halchin

Ian Sidle

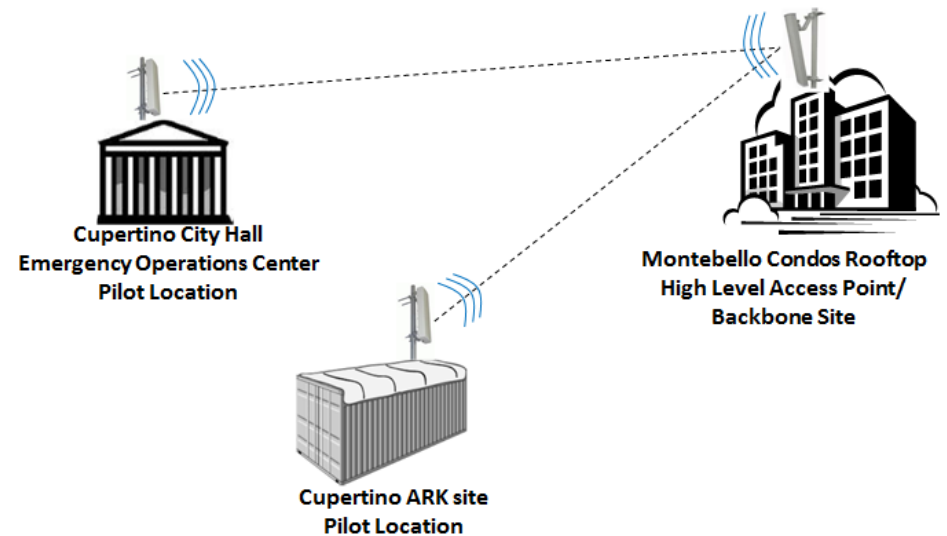
Skip Stevens

Marcel Stieber



# The Details

1. Design build – went per the plan; System Design Doc was produced.
2. Build – a functional test was held in the EOC on 27-December. All hardware was checked out as designed.
3. Deployment – one site per day, passed functionality test on 10-January.
4. And, we have internet access through the SCEWN connection.



# EOC Site

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**Deployed:** Thursday 8-Jan

**Assisted by:** Pete Coglianese

## Notes

- Attached to the Back-end of the SCEWN antenna mast.
- Cable pulled into the EOC, Center north Column
- Current site of Internet connectivity and the application server, but these can be dynamically moved.





# Montebello Site

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**Deployed:** Friday 9-Jan

**Assisted by:** Tom Sanford, Rob McCoy

## Notes

- Temporary location; we will need a different or another site to cover the rest of the city (the Civic Center building is “in the way”).
- Data cable run into W6TDM repeater site for power.



# Hyde ARK site

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**Deployed:** Friday 10-Jan

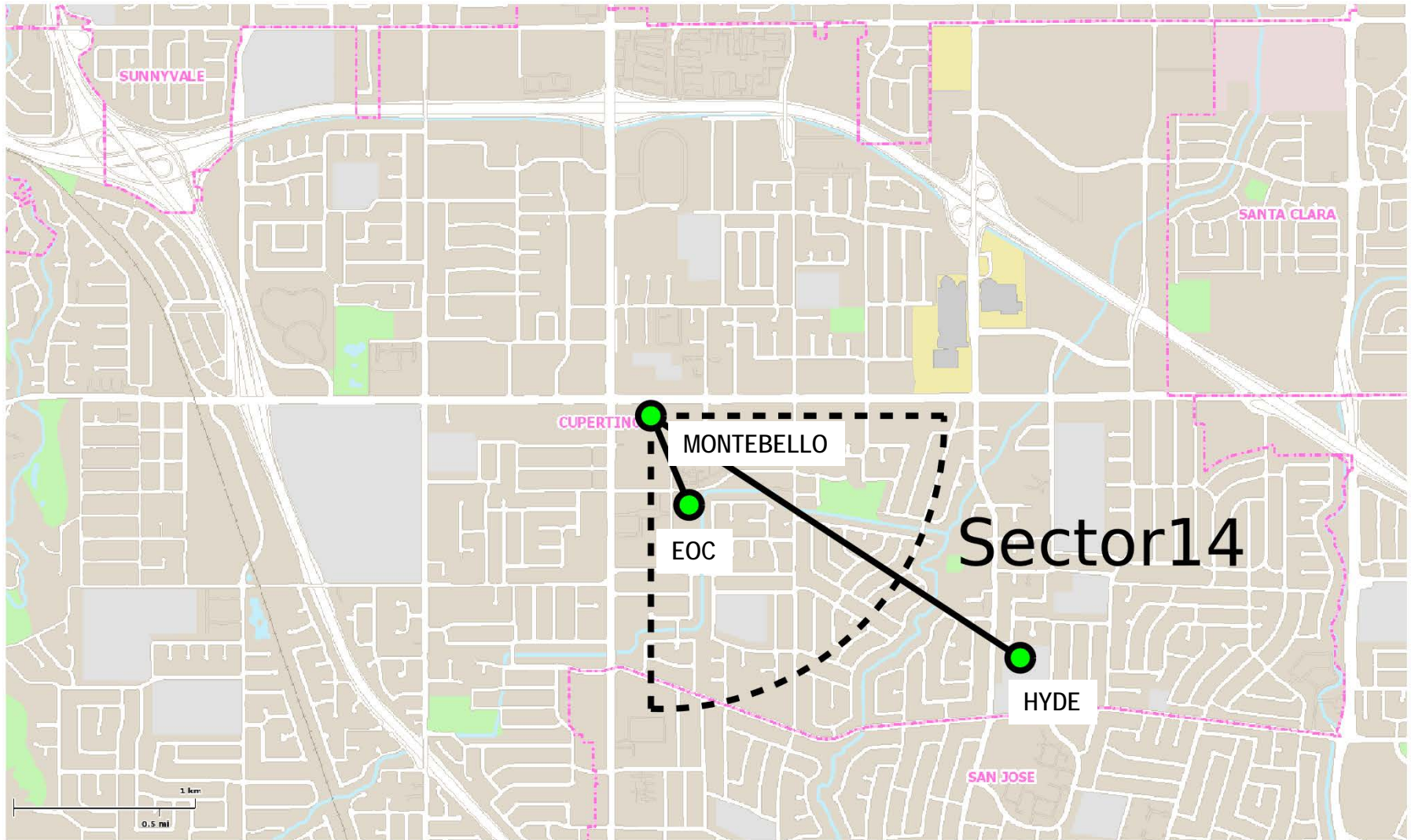
## Notes

- Temporary installation to confirm the RF path through the trees.
- Solar and Battery Powered for temporary operation
- Final deployment will depend on gas generators or a much larger solar panel





# Pilot Coverage



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# Summary of Performance

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## End-to-end performance:

- 9.8Mbps throughput (target: 10.0Mbps)
- 8.1ms latency (target: less than 50.0ms)

## What does this mean?

The network will be able to support applications including Voice over IP, Instant Messaging, some video streaming, and transfer of large files between ARKs and the EOC.



# Pilot Cost

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1. Network Equipment...	\$353.57 <sup>(1)</sup>
2. Masts, tripods...	\$119.57
3. Cables, connectors...	\$ 21.00
4. <u>Misc Components...</u>	<u>\$ 49.80</u>
5. Total	\$543.94

## Notes:

(1) cost was less by borrowing personal network equipment for the pilot. These deferred costs would be rolled into the full deployment.

# Demo

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What we will do

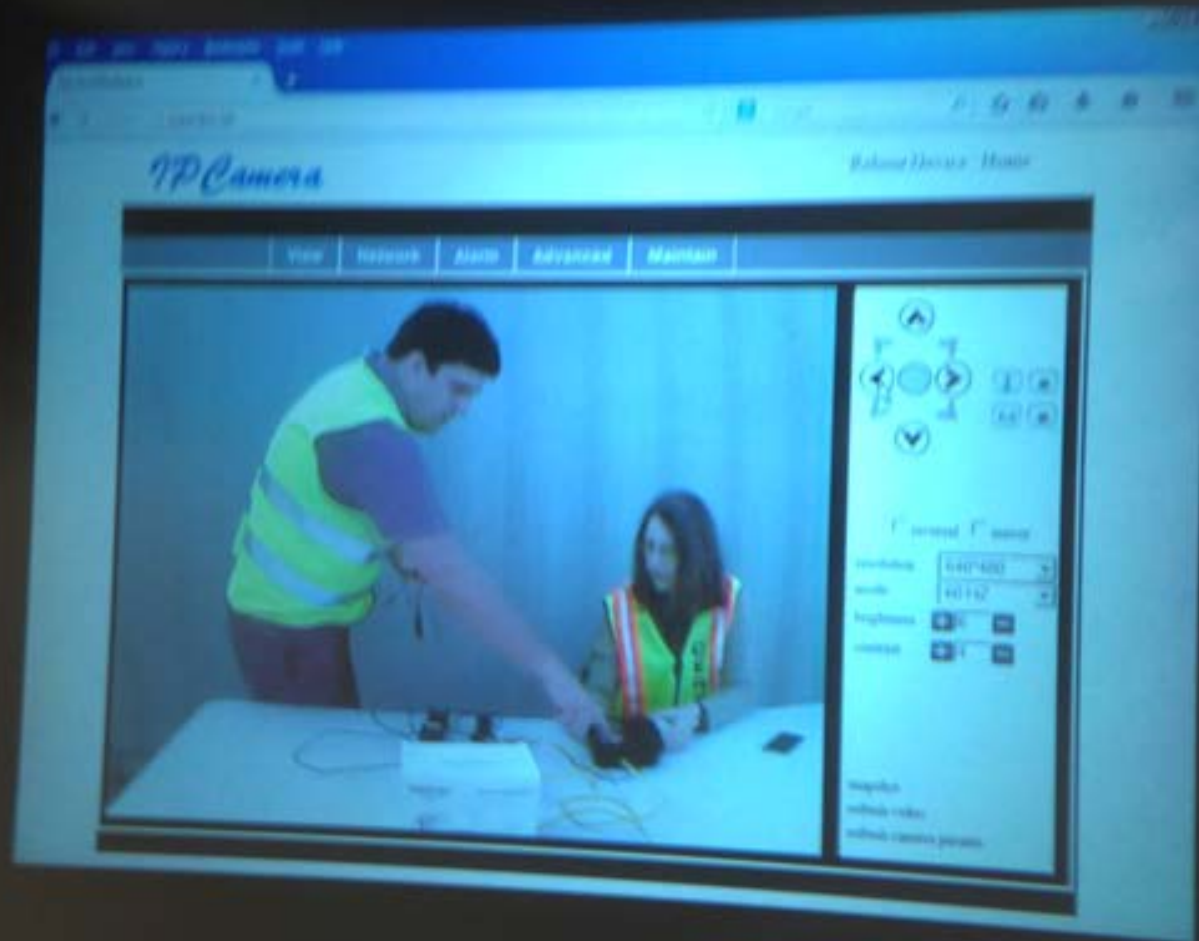
- Make a call to Hyde ARK, extension CUPHYA (287-492)
- View webcam at [webcam.hyde.cupertino.ian](http://webcam.hyde.cupertino.ian)

**NOTE:** The purpose of the demo is to show connectivity between the EOC and the Hyde ARK through ARKnet. It is not intended to show off all applications that could be deployed in support of an emergency response.



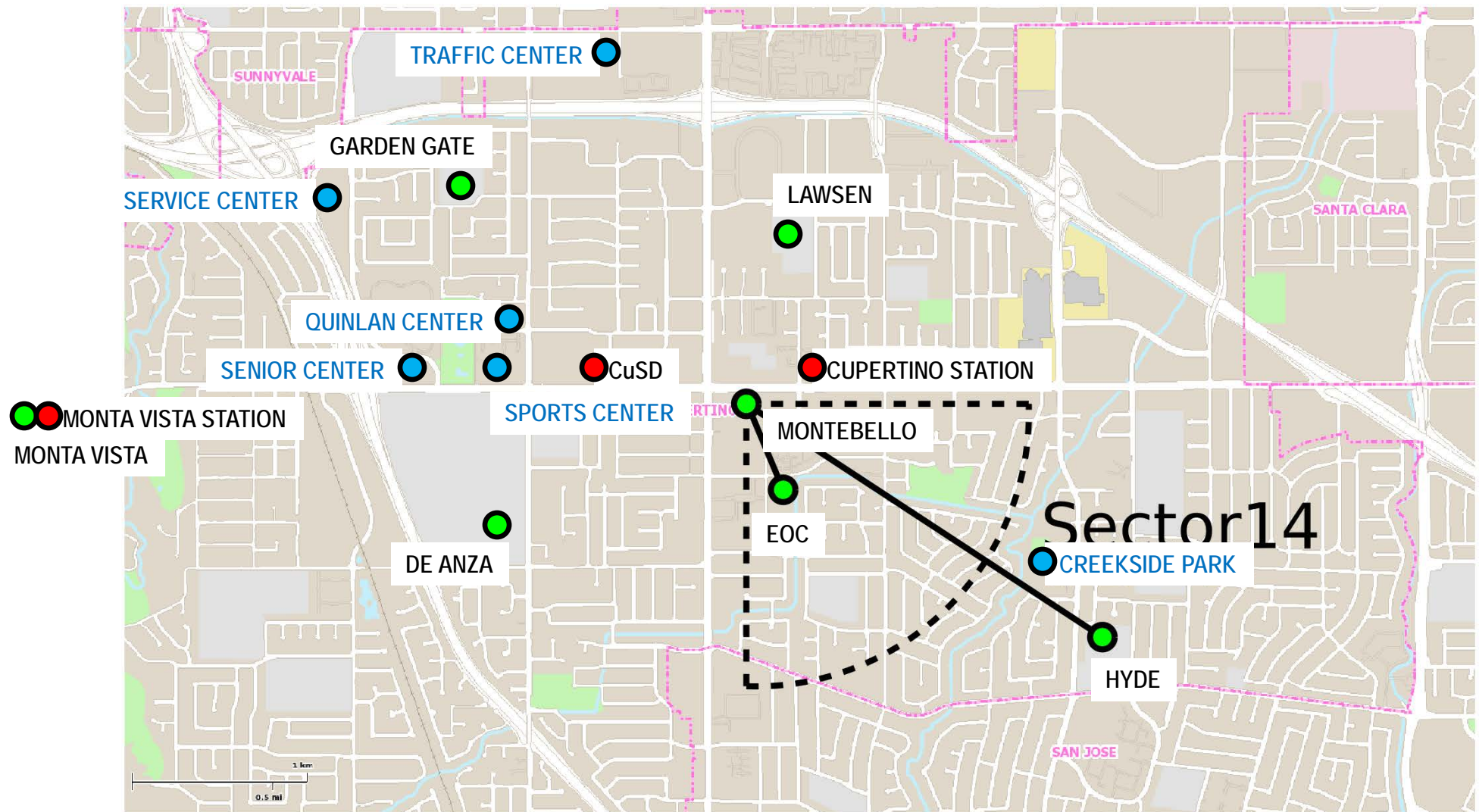
# Demo... live, from Hyde Ark!

[Via webcam.hyde.cupertino.lan](http://webcam.hyde.cupertino.lan)





# Future Sites... ARKs, City sites, Served Agencies



● SEVEN SPRING STATION

● SEVEN SPRINGS

Cupertino Citizen Corps





# Next Steps

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## Summary

1. We can deploy commercial off the shelf network components to create the ***Cupertino Emergency Intranet***.
2. While performance is acceptable for the pilot sites, these are not the furthest sites from the center of town; all sites need to be evaluated.
3. The full deployment will require additional sites to ensure adequate coverage with the rest of the city.

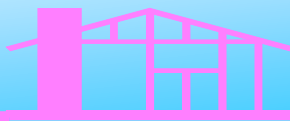


# Next Steps

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## Recommendation

1. Kick off an ARKnet Phase 2 Project, *Analysis Phase* only.
2. The primary deliverable is a plan for how we will cover the balance of the ARK, City, and other sites.
3. Hold an Analysis Phase Review with City Staff on our findings; recommend the next course of action.



# Thank you

*Any Questions?*

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