



UTAH COMMUNICATIONS AUTHORITY

KEEPING PUBLIC SAFETY CONNECTED

2025 UCA Operations Division Update – Philip Krebs



2024-2025 Radio System Update

Project upgrades 119 existing 800Mhz trunked sites to an APCO P25 Phase II compliant system supplied by L3Harris

- 119 Upgrade Sites - **Online**

Project also adds 25 new sites to the UCA infrastructure

- 25 Expansion Sites – **Online**

Cutover – **Complete**

Project Remaining Tasks

- **Update, Burn In, Wrap Up**

Financial approval for 11 new P25 Sites

- **5** Sites ready to be installed
- **11** Sites received at UCA warehouse

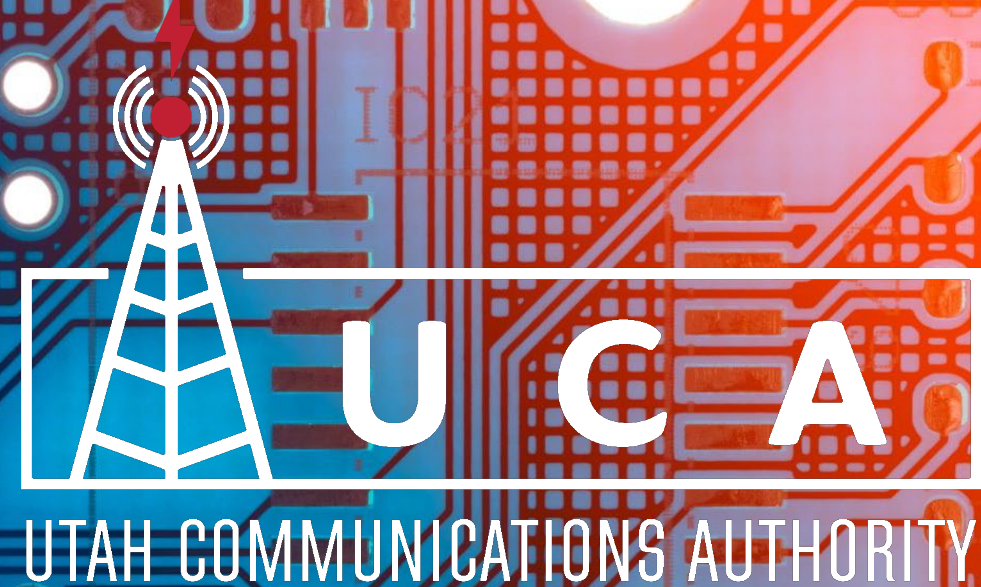
Network Backhaul

- **34** New Redundancy Links Installed
- **6** End of Life Microwave Links Replaced
- **15** Links Planned for Replacement in 2025-2026

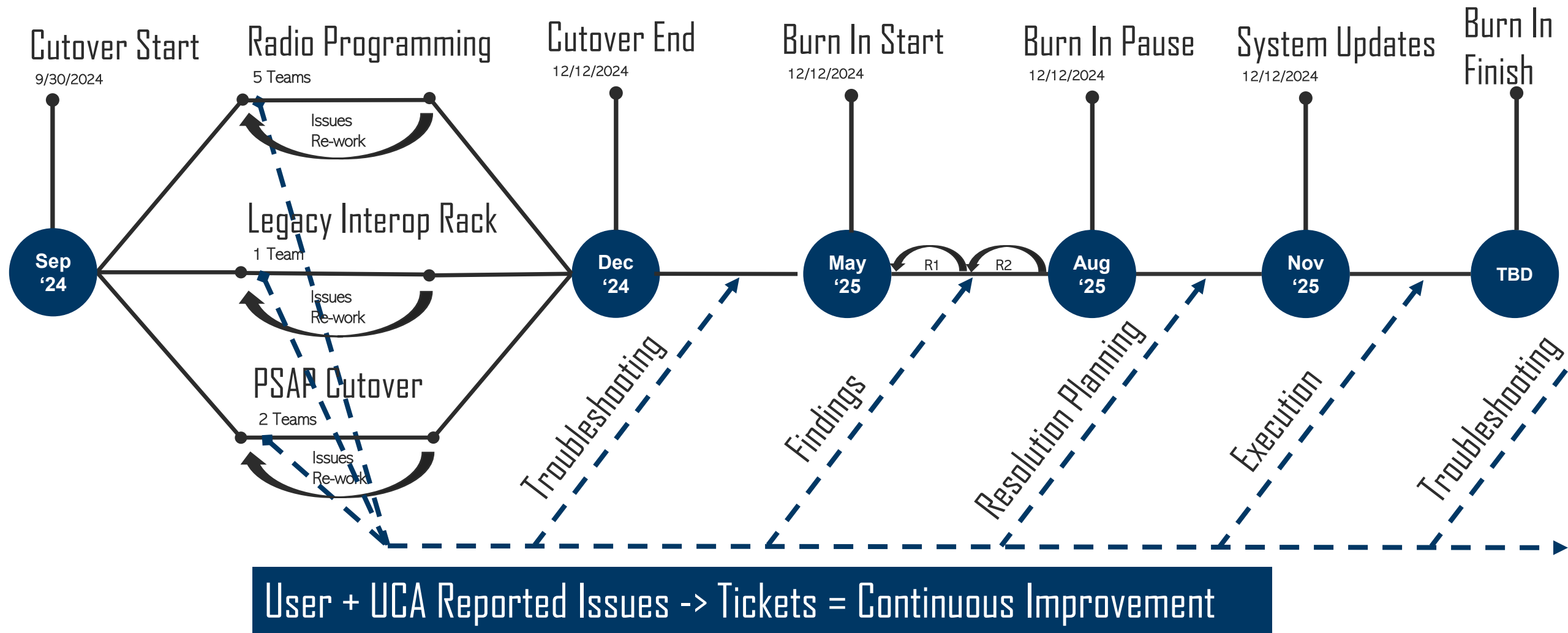
New ticketing system – **Online**

New alarm monitoring system – **Online**

Diagnostic and Automation Software - **New SW** written by UCA

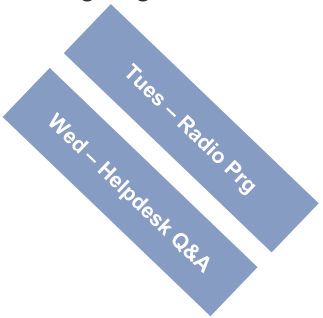


2024-2025 P25 Project Execution

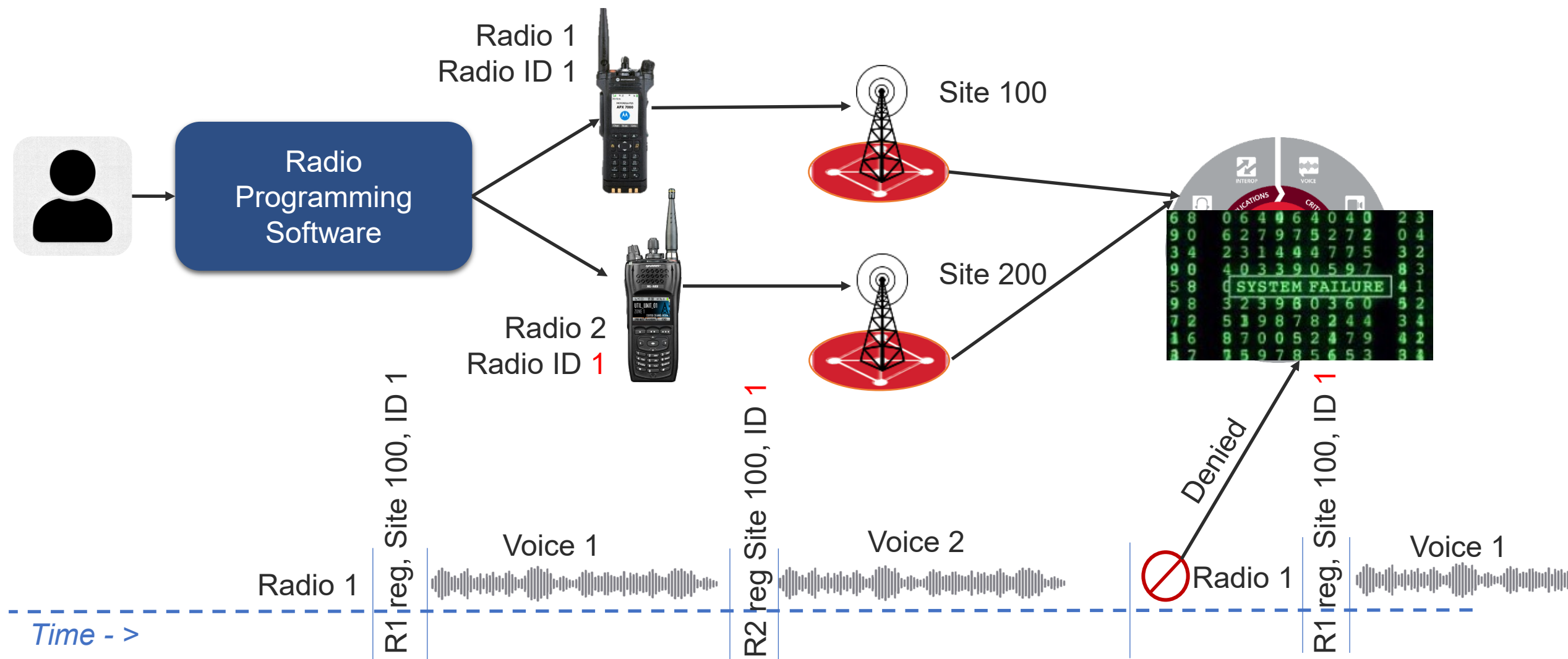


System Wide Issues and Resolutions



Date	Issue(s)	Reported By	Root Cause(s)	Resolution Status
10/9/2024	Radio Personalities/Code Plugs not ready for programming, causing delays on day of programming.	Multiple Agencies	(UCA) File Configuration Control Lacking (UCA) Email Communication Breakdown - Some agencies didn't communicate about which talk groups they would interoperate on (fleet map wasn't decided on) - Last minute changes by agencies to fleet map	Throughout cutover, Ongoing, ~98% Complete 
10/9/2024	Talk groups don't work in areas where they previously were allowed.	- Kordine Nelson (Price PSAP) - Alicia Gleave (Richfield PSAP)	Human error. Mis-configuration due to talk group classification	Closed 10/9/2024 
10/30/2024	Large amounts of missed traffic when scanning (dispatch->field) when simul selecting talk groups.	Multiple Agencies	Radio programming has Scan Configuration->Scan Wide->General->"Voice Rx Tx Hold Time(sec)	Closed 11/1/2024
12/17/2025	Otherwise, healthy radios in good coverage issue a PTT deny (bonk)	- Multiple Agencies - Murray Fire (Nick, Haskin)	- UCA directly tracked lack of firmware updates to key up bonks. - UCA directly tracked lack of radio tuning to key up bonks/missing audio. - Human Error: Duplicate IDs found some caused by UCA during programming and some by agencies programming their own radios. - Incorrect radio programming setting TDMA in channel config found to cause PTT denies depending on channel state PH1/2	Ongoing  
12/20/2025	Simul Select of talk groups taking a long time for dispatchers(up to 30 seconds)	Kordine Nelson (Price PSAP)	Found to be caused by a combination of the large number of radio IDs on the UCA system and L3Harris MFID A4 patching mode.	Workaround in place 1/9/25, software resolution: Nov 25 
12/20/2025	- ATL and Paging calls dispatch to field, missing first 7-10 seconds of call. - All brand radios miss the first 7-20 seconds of any simul selected call.	- Justin Grenier (St. George) - Bryan Low (Logan)	Found to be an issue with control channel message queue length and where simul selects are placed in the queue in L3Harris MFID A4 patching mode.	Workaround in place 1/9/25, software resolution: Nov 25 

Duplicate Denies (Bonk)

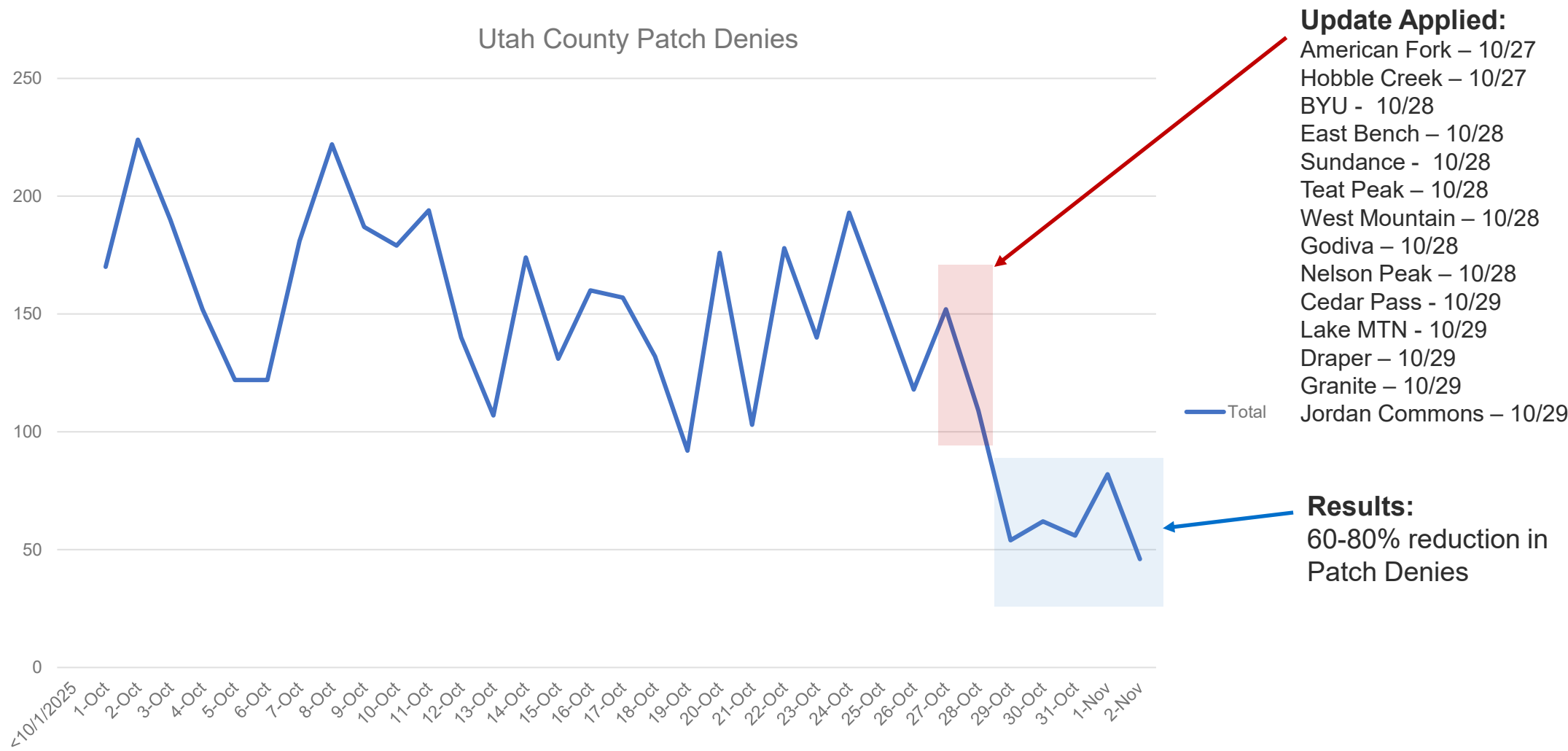


System Wide Issues and Resolutions



Date	Issue(s)	Reported By	Root Cause(s)	Resolution Status
1/25/2025	- All brand radios miss the first 7-20 seconds of a newly patched transmission or switch to a channel that is patched. - All radios receive a PTT deny (bonk) when trying to transmit within the first 7-20 seconds of a newly patched transmission or switch to a channel that is patched. - Moto and Kenwood radios miss the first 7-20 seconds of dispatch transmission or receive a PTT deny (bonk) when roaming between sites.	UCA	Found to be an issue with control channel message queue length causing this behavior	- Workaround 3/26/2025 - Software resolution: Nov 25
1/30/2025	Coverage not in places where it used to be on the legacy system	UCA, Multiple Agencies	- Antenna gain/downtilt patterns specified in the original design found to not be optimal for many sites across the state. - Antennas found to be self interfering due to internal hardware failures within the antenna. - As part of antenna replacement many site installation problems were uncovered causing degraded site performance.	Ongoing, 92/109 antennas replaced
2/5/2025	High Low Audio issues for field users	L3H, PSAPs	- Radio Programming, Bluetooth Accessories - Console Static Audio Settings - Console Dynamic Audio Settings	Complete - 10/1/2025
2/15/2025	Frequency Reuse causing interference	UCA	Re-use of frequencies per original design was causing center frequency interference at some sites.	Closed - Shawshank 3/17 Workaround – SL/Utah Co 6/17
3/10/2025	Pagers triggered but missing audio	UCA, Multiple Agencies	New system drops carrier between page tones and dispatch voice caused pagers to reset prematurely and miss audio.	Resolved – Agencies re-programmed pagers
5/25/2025	Physical channels on busy sites found to lockup while transmitting on a particular talk group. Any users that roam on to the site on the locked talk group receive a repeating PTT deny (bonk)	SLCO Sheriff's Office (Darin Waterous)	Timing issues between P25 Phase 1 and P25 Phase 2 calls caused the channel to not be released from transmit state.	Sites where channels have locked have been updated, completion will be Nov 25 software update
7/12/2025	When patching an encrypted talk group to an unencrypted talk group traffic is missed on the unencrypted talk group	Weber 911 (Kevin Rose)	Moving to MFID A90 Motorola Mode patching inadvertently reintroduced this issue.	Software resolution: Nov 25
10/16/2025	Radio Keys up, key up is seen by dispatch, but no audio comes through	VECC (Ambir Widdison) Robert Brough	- Radio out of tune - Transcoder Not Keyed Properly - Radio prefers Phase 2 site that is greater than 75 miles away.	Ongoing - Initial PH 1 work complete

November SW Update Initial Results

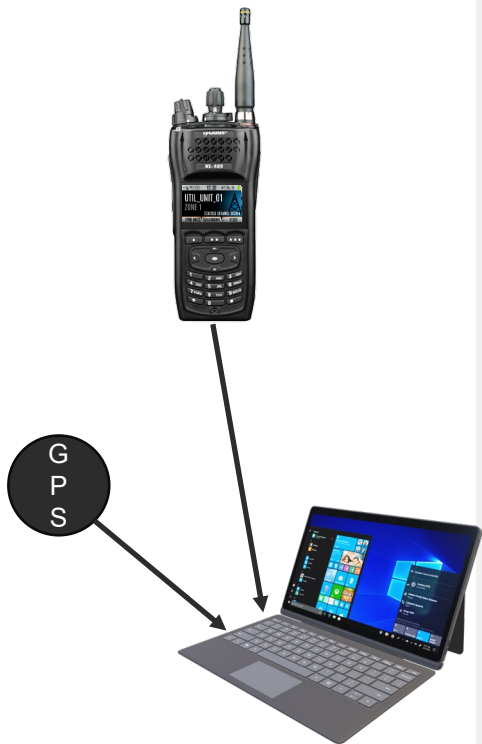


P25 Antenna Replacement Project



- Logger Demo
- Antenna Failures
- Antenna Downtilt and Gain Adjustments

UCA GPS RSSI Logger



UCA GPS RSSI Logger

GPS COM Port

COM4

GPS Baud Rate

9600

Radio COM Port

COM9

Output Directory

C:\Users\pkrebs\Desktop\RSSI Logs

Choose Directory

☐ Offset GPS Track For Readability On 2nd Pass

☒ Log Adjacent Sites

Bad Roam Detection Threshold

11

dBm

Start

Stop

GPS Status	Latched Site	RSSI
Location Fixed	St George Simulcast	-65
Latitude	Best Adj Site	RSSI
37.0784933333333	Hurricane Mesa	-87
Longitude		Roam Delta
-113.582161666666		-22

Antenna Failures

UCA GPS RSSI Logger

Site: Site IP Addr (first 3 octets):

Shutdown Site (tme all chan) Disconnect

Restore Site (tmx all chan) Start RSSI Mon For All Chan

Start BER Mon For All Chan

RSSI Failure Threshold:

Ch 1	Ch 2	Ch 3	Ch 4	Ch 5	Ch 6	Ch 7	Ch 8	Ch 9	Ch 10	Ch 11	Ch 12	
-105.9	-107.8	-108.8	-54.8	-109.4	-109.4	-109.4	-110.3	-113.8	-112.5	-112.1	-112.9	<-- Current Measurement
-104.163	-109.93	-110.710	-107.616	-110.223	-110.190	-110.586	-111.153	-113.546	-110.060	-112.753	-107.246	<-- 30s Average
Key	Key	Key	Key	Key	Key	Key	Key	Key	Key	Key	Key	

Ch 13	Ch 14	Ch 15	Ch 16	Ch 17	Ch 18	Ch 19	Ch 20	Ch 21	Ch 22	Ch 23	Ch 24	
-110.3	-111.7	-112.5	-114.3	-108.8	-111	-112.1	-112.9	-111.3	-72.1	-113.4	-112.9	<-- Current Measurement
-112.190	-113.480	-112.993	-114.893	-109.556	-110.303	-112.500	-113.026	-112.756	-103.106	-112.983	-112.803	<-- 30s Average
Key	Key	Key	Key	Key	Key	Key	Key	Key	Key	Key	Key	

Lightning



Internal Cable Fatigue

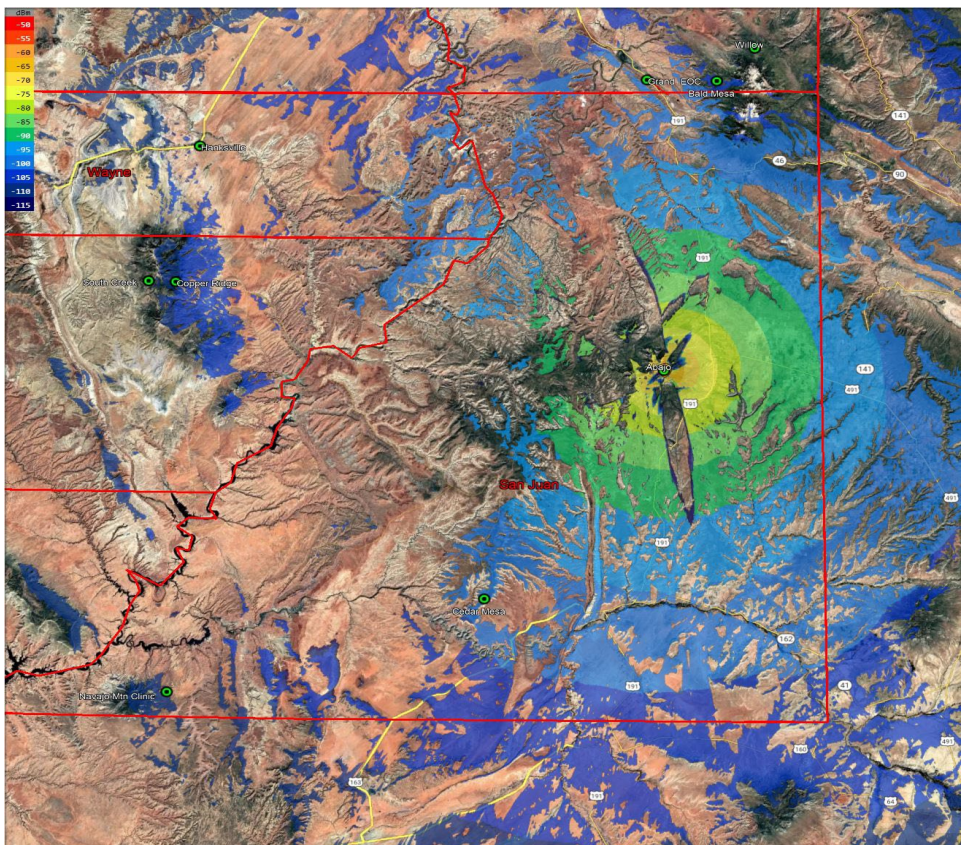


Burned Lifted PCB

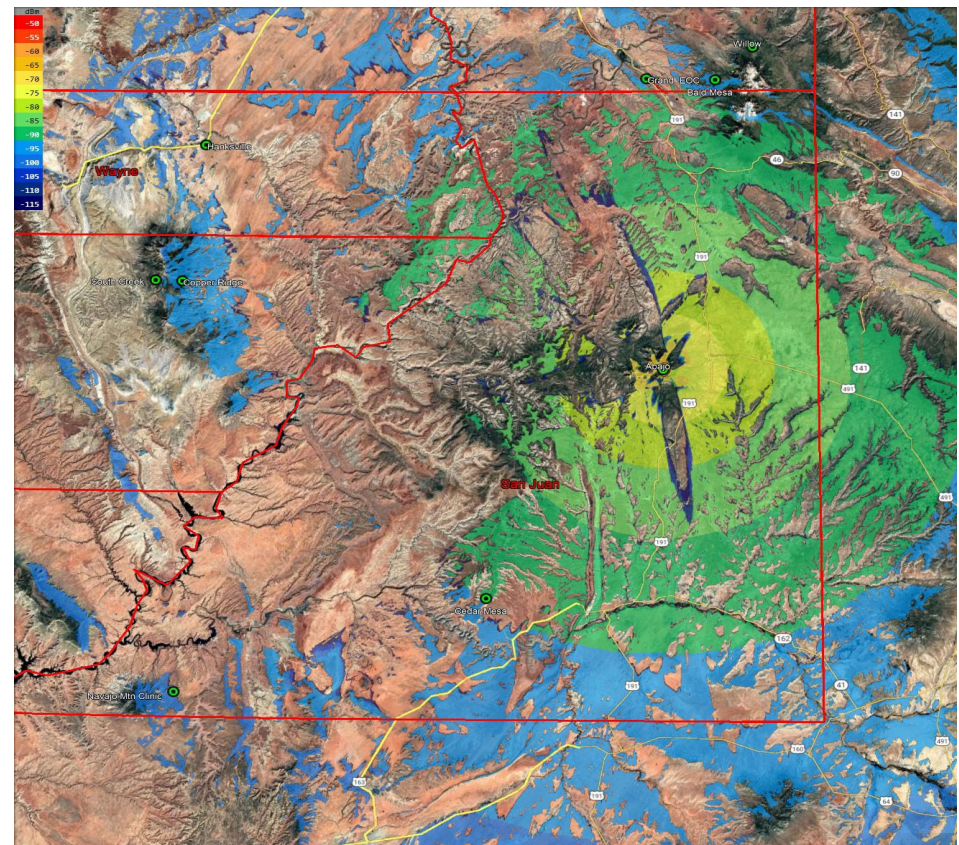


Abajo – San Juan

Pre-Swap

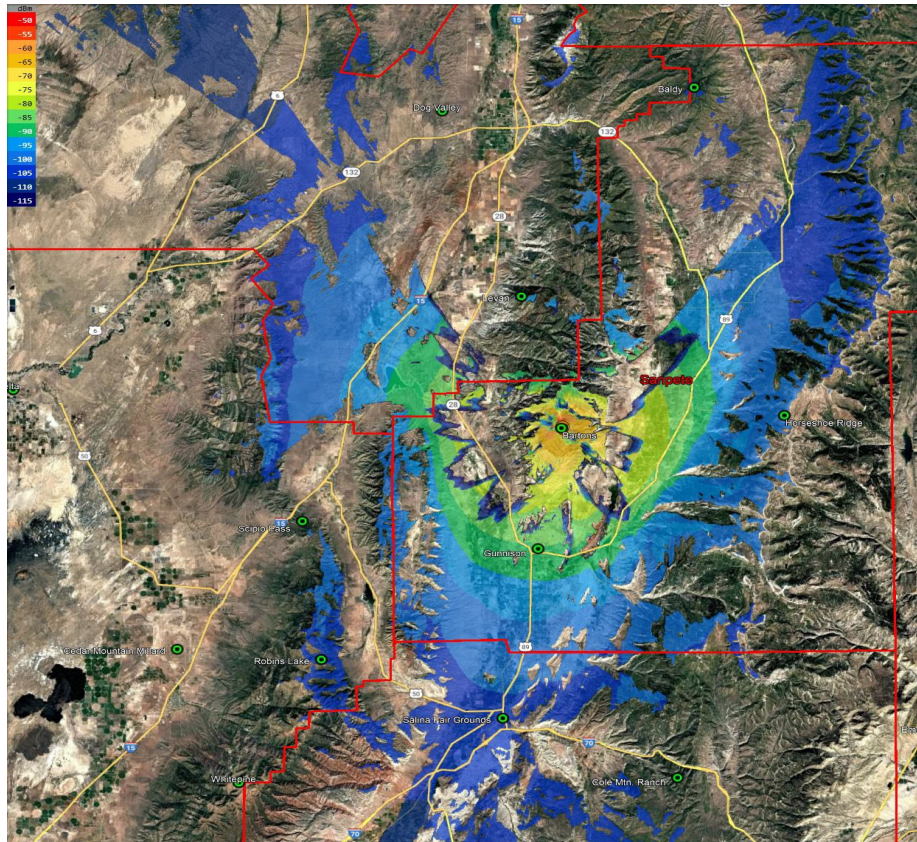


Post - Swap

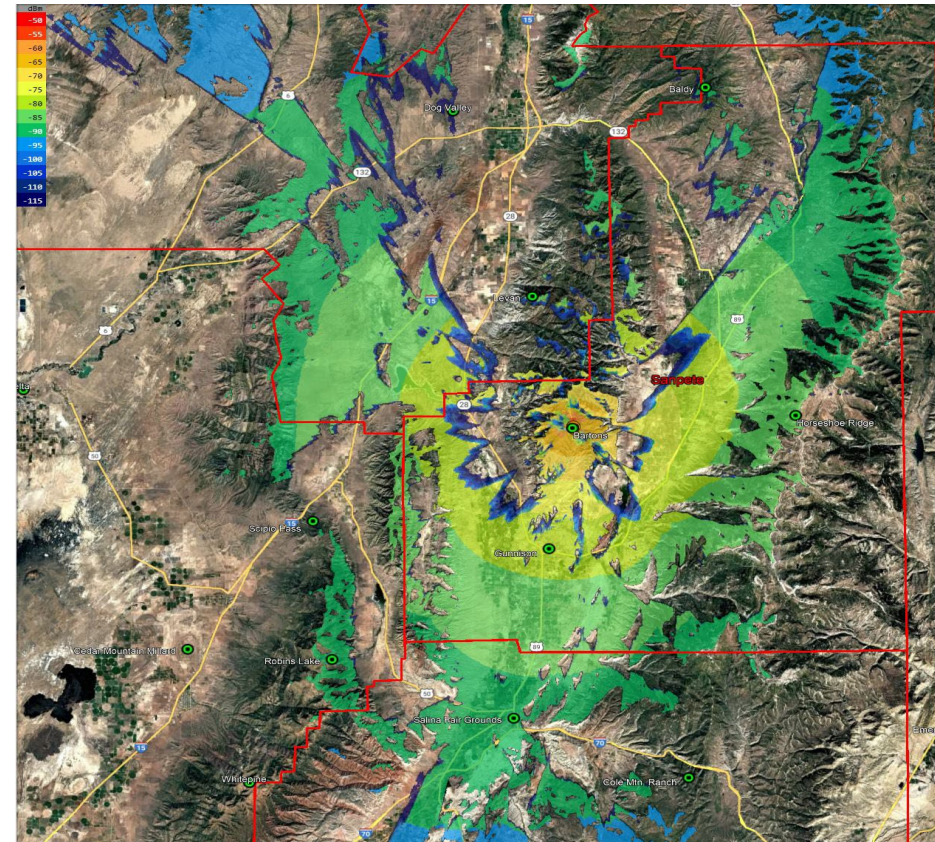


Barton's Peak – Sanpete

Pre-Swap

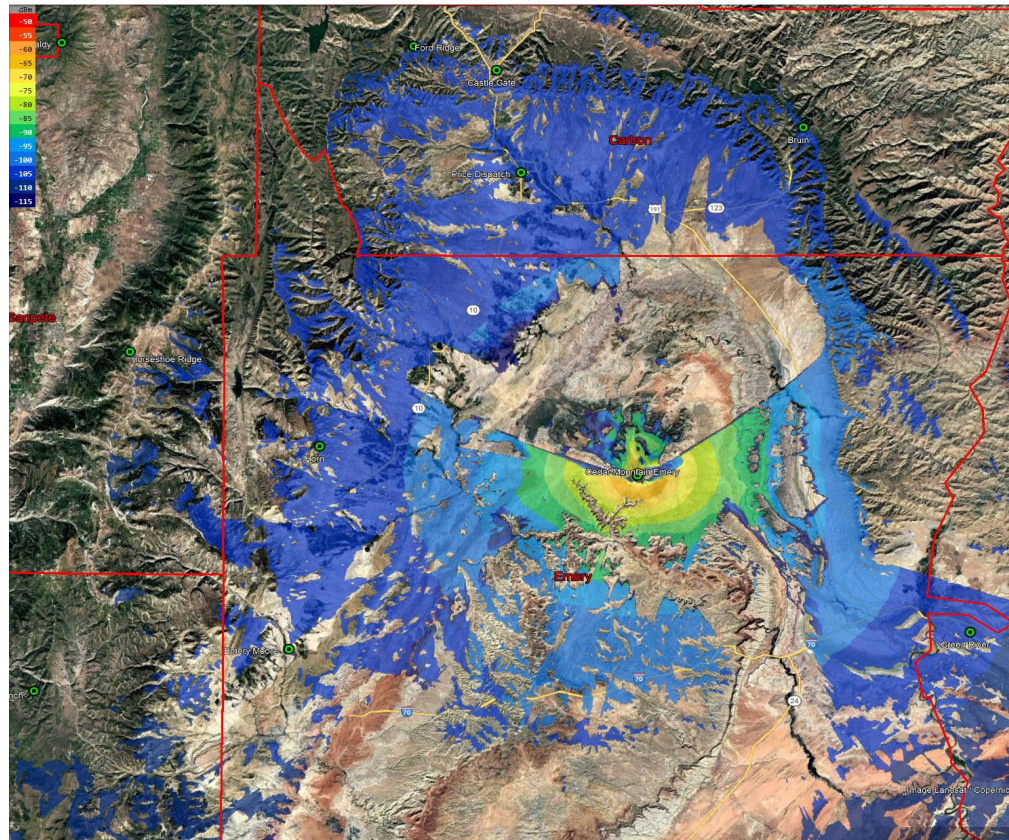


Post - Swap

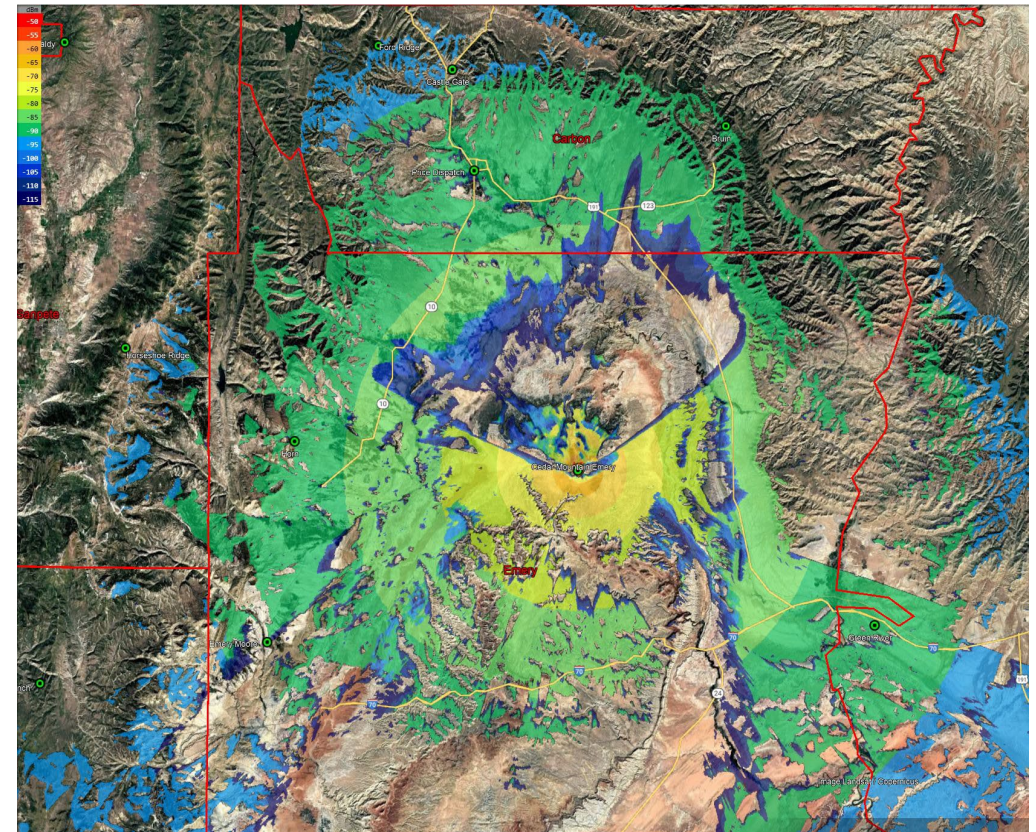


Cedar Mountain Emery – Emery

Pre-Swap

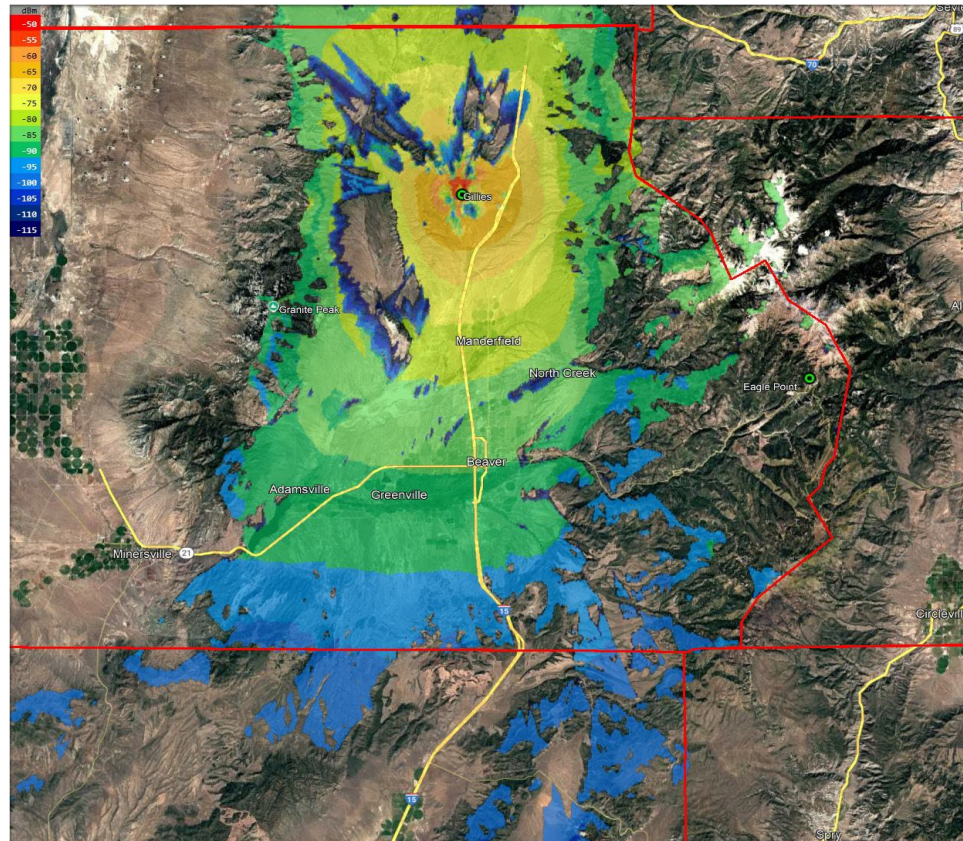


Post - Swap

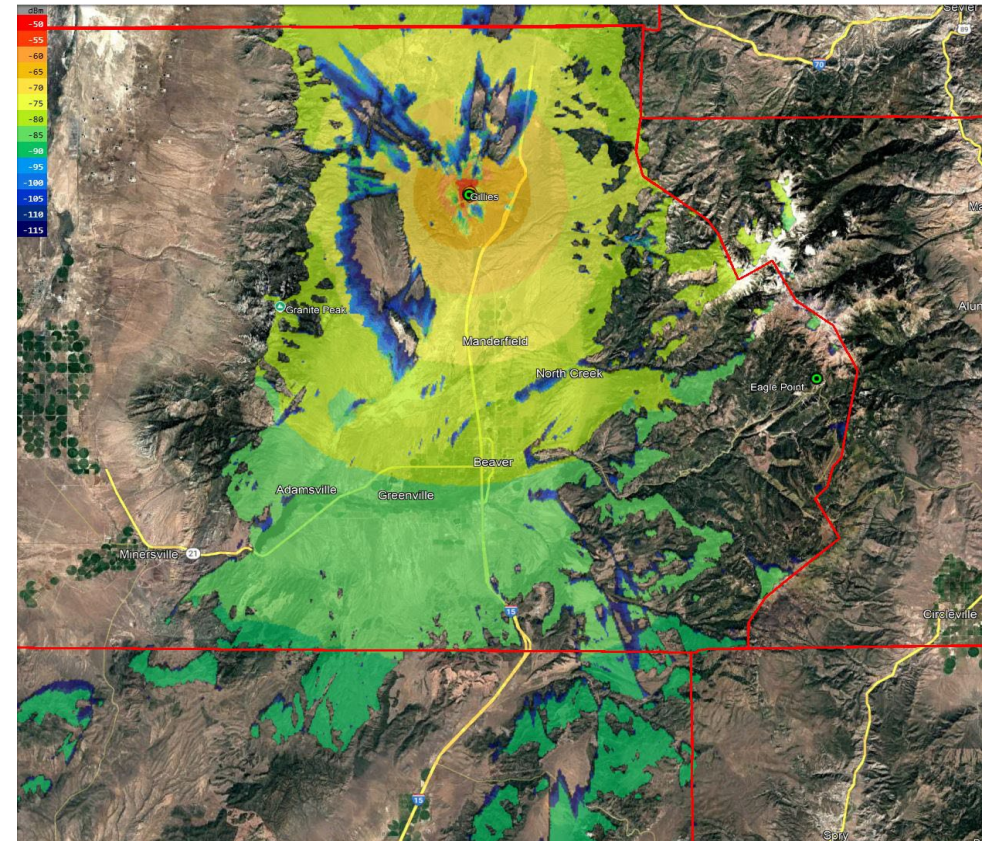


Gillies - Beaver

Pre-Swap

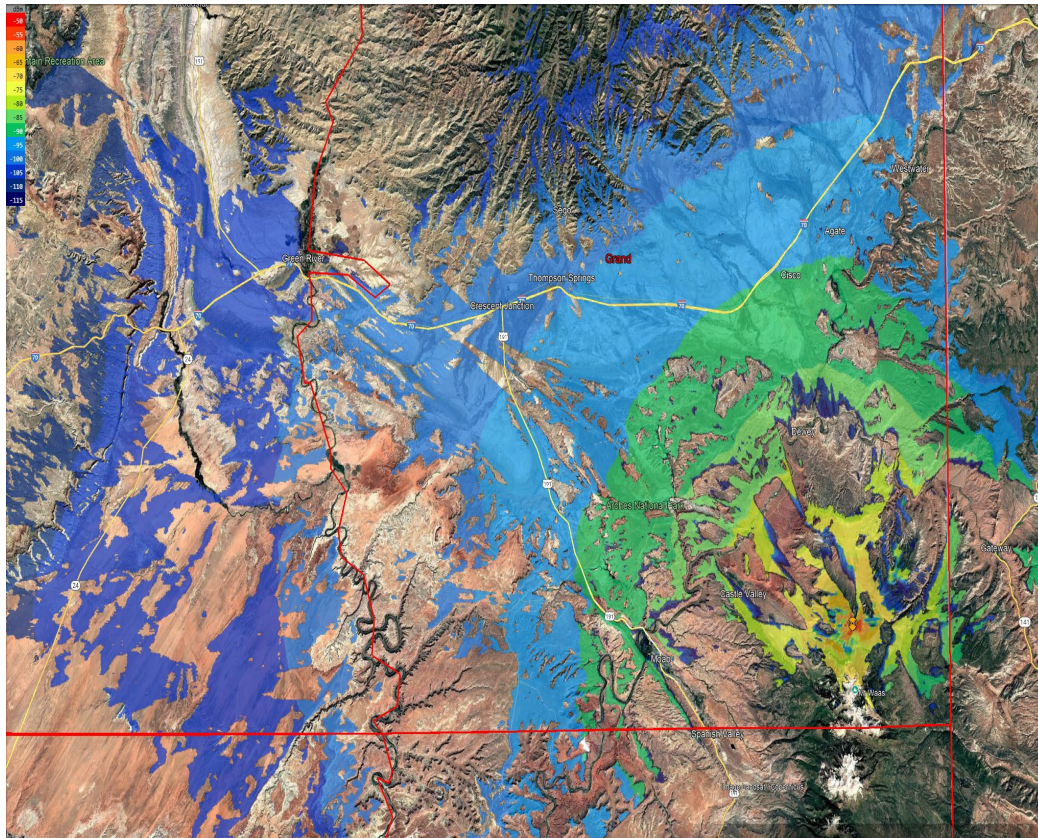


Post - Swap

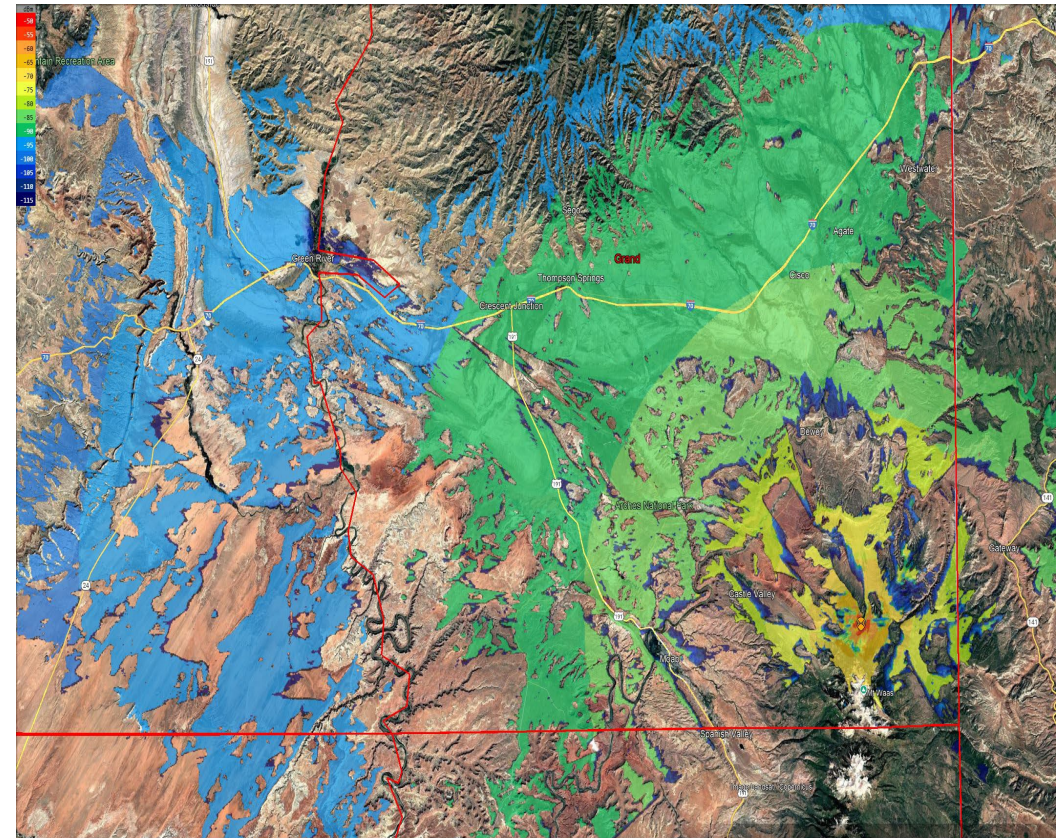


Willow (Grand County)

Pre-Swap

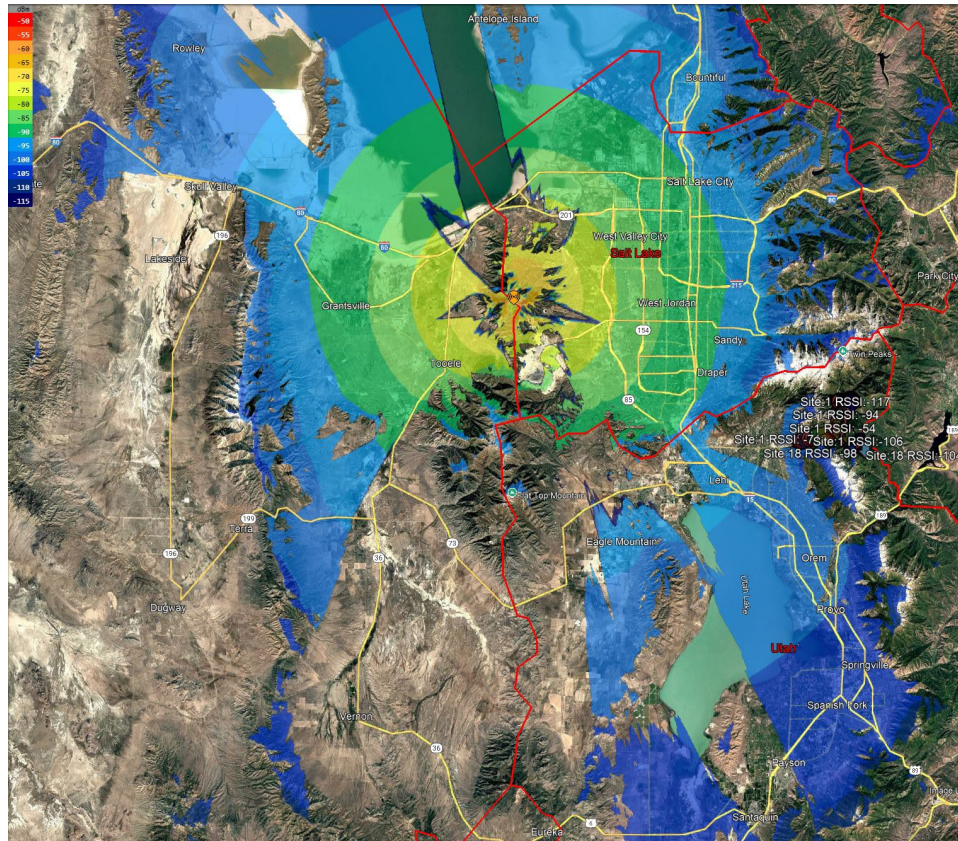


Post - Swap

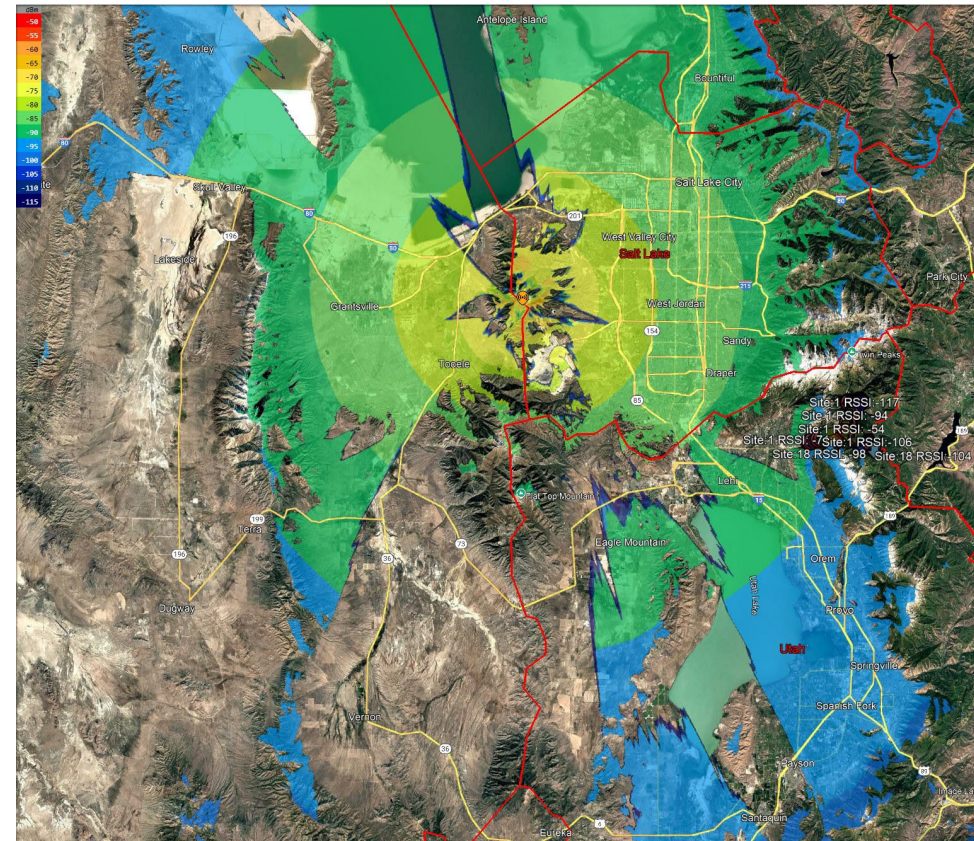


Nelson Peak (Salt Lake County)

Pre-Swap

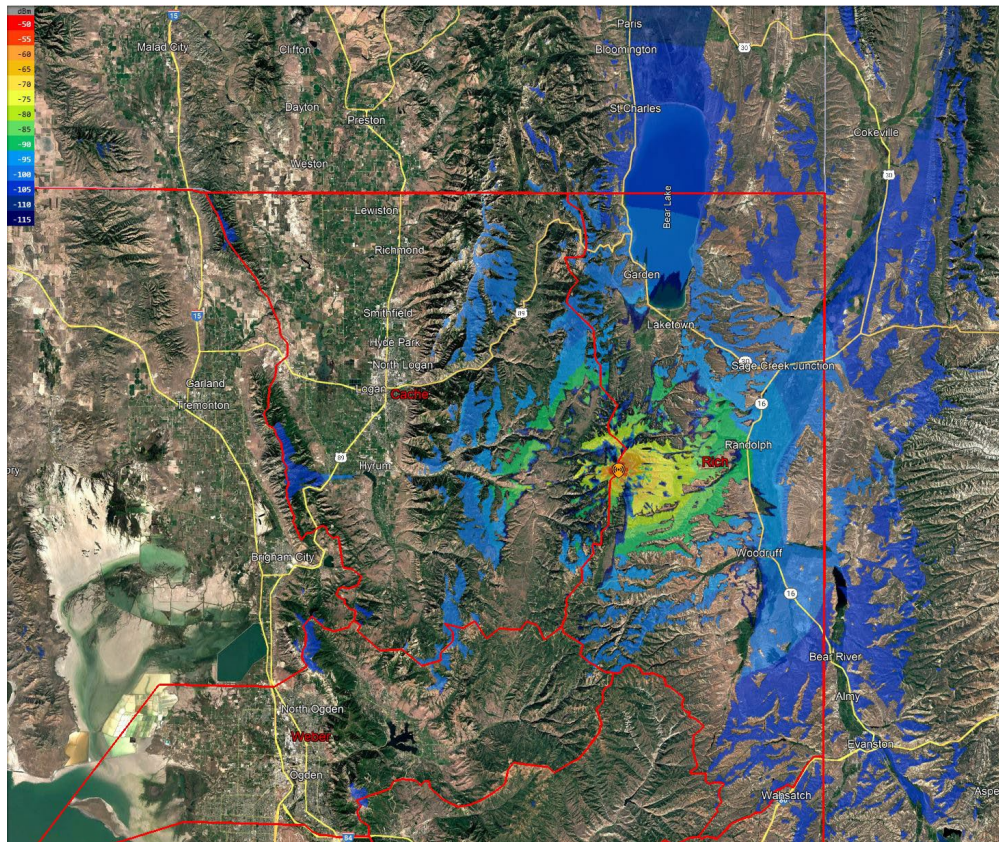


Post - Swap

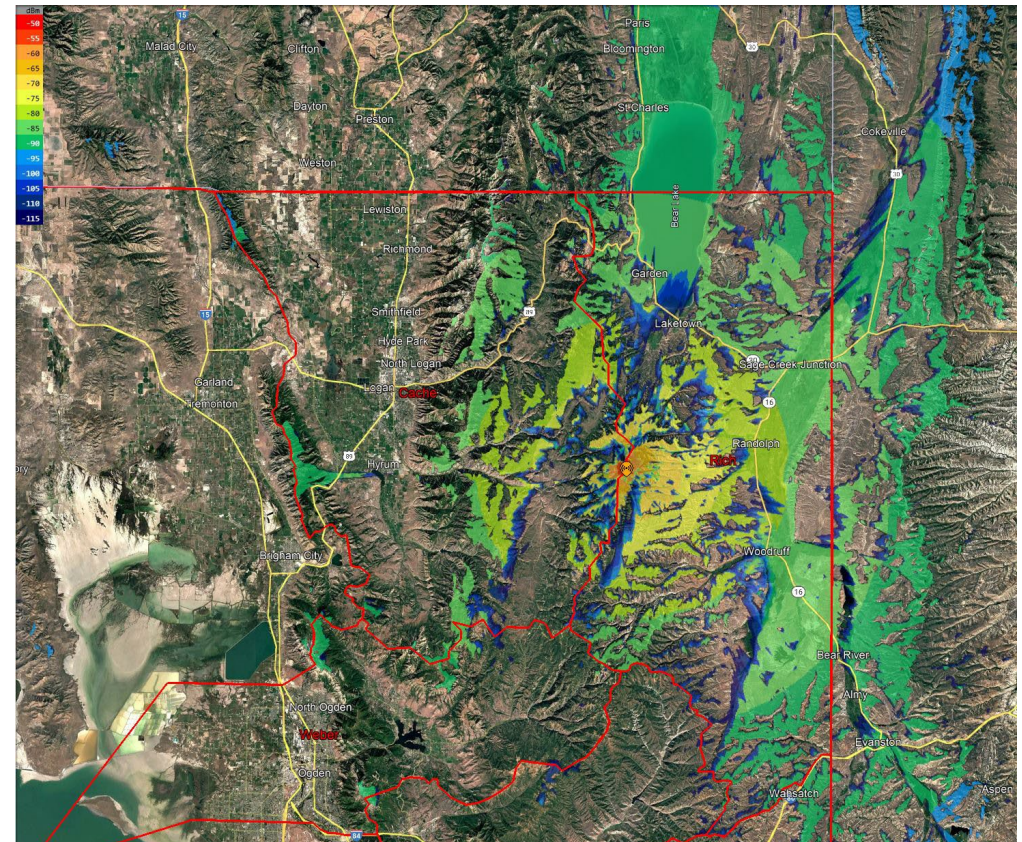


Red Spur (Rich County)

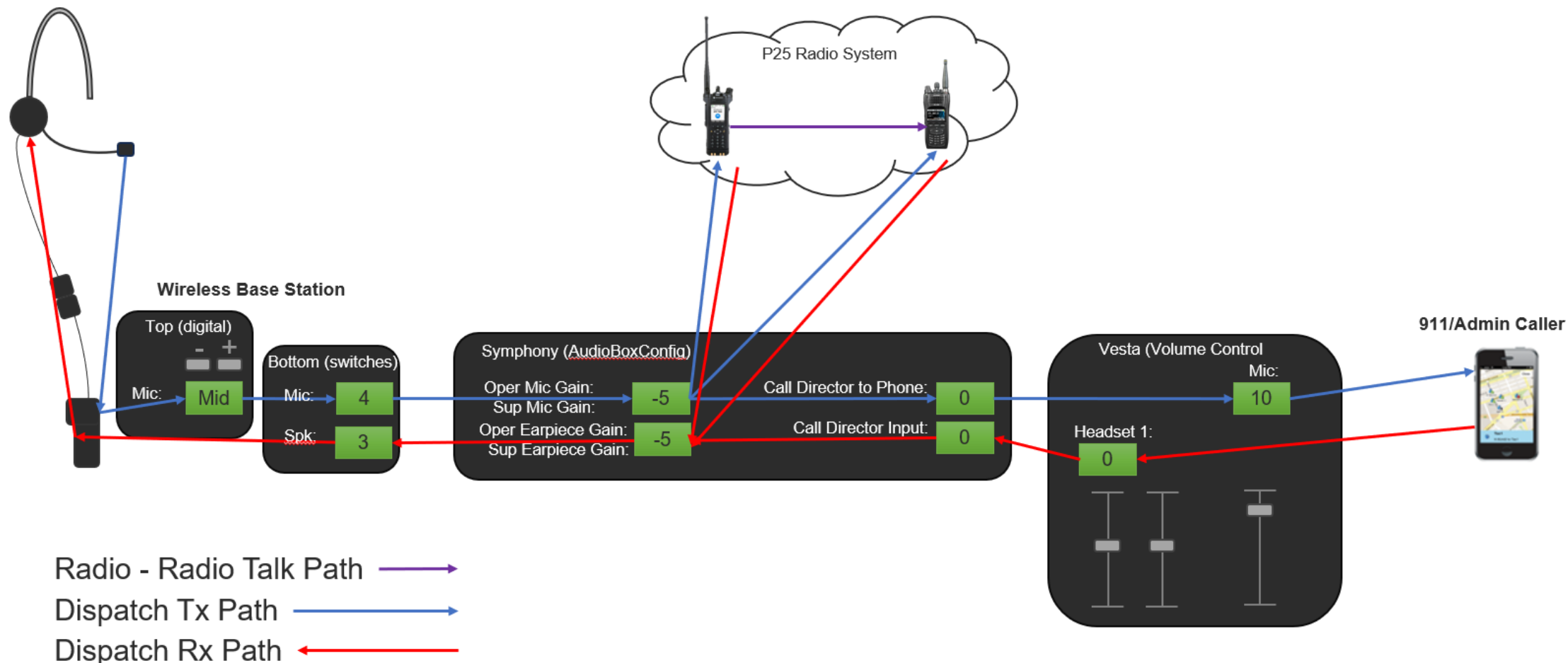
Pre-Swap



Post - Swap



Overall Settings Layout



Lessons Learned at Logan PSAP 8/15



- Headsets even just the portion between the hip switch remote and headset/boom make a **large** difference in audio level/quality.
- The coarse gain dip switch setting on the bottom of the wireless Base Station really is a coarse gain. If there is a quiet headset attached to the hip switch remote the gain will have to be bumped up to 4 on the base station in order to keep the symphony audio gain at a reasonable level and therefore keep echo in check and eliminate audio volume spikes after pauses.
- Watching the VU meter at the beginning of the first syllable but after a pause is an indicator of whether ALC will attempt to lower the gain using its algorithm. Ideally it seems to want the audio to come in right in the middle 3rd of the VU meter.



Audio Audit Software

- Detect field and dispatch users that are Loud or Soft
- Detect Garbled, Distorted, Clipped, Deadkey transmissions
- Detect installation problems with mobile radios
- Detect out of tune radios or failing radios
- Future: Correlate corrupt audio to failing channel components at the site

Call Start Time	Duration	Status	Duration	Clipped %	Clip Level	Avg ZCR	Garbled Score	Avg RMS	Volume Sp
2025-10-22 00:00:08	00:03	Normal	3.24	0	0.143616	0.158466	0.9	0.01282	Normal
2025-10-22 00:00:13	00:02	Garbled	1.32	0	0.103424	0.207098	13.3	0.008033	Normal
2025-10-22 00:00:21	00:03	Normal	3.06	0.016	0.999969	0.187675	9.7	0.031774	Loud
2025-10-22 00:00:25	00:02	Normal	1.24	0	0.078857	0.221789	9.5	0.009442	Normal
2025-10-22 00:00:28	00:02	Normal	1.76	0	0.105652	0.188418	0	0.012013	Normal
2025-10-22 00:00:31	00:01	Normal	0.9	0	0.022491	0.103172	0	0.001744	Soft
2025-10-22 00:00:34	00:01	Normal	0.72	0	0.048889	0.192067	0	0.005255	Normal
2025-10-22 00:00:42	00:02	Normal	1.88	0	0.079376	0.178261	6.3	0.010013	Normal
2025-10-22 00:00:48	00:01	Garbled	1.44	0	0.083191	0.175067	12.2	0.006009	Normal
2025-10-22 00:00:51	00:01	Normal	0.72	0	0.12442	0.194154	0	0.00849	Normal
2025-10-22 00:00:58	00:02	Normal	1.6	0	0.159119	0.189868	0	0.01269	Normal
2025-10-22 00:01:04	00:01	Normal	0.9	0	0.114777	0.07785	0	0.007078	Normal
2025-10-22 00:01:06	00:01	Normal	0.68	0	0.110718	0.220554	0	0.010014	Normal
2025-10-22 00:01:10	00:01	Normal	1.8	0	0.18222	0.092406	1.6	0.020245	Normal
2025-10-22 00:01:13	00:01	Normal	0.52	0	0.026031	0.134308	0	0.003249	Soft
2025-10-22 00:01:15	00:03	Normal	2.76	0	0.051453	0.186859	0	0.004358	Normal
2025-10-22 00:01:18	00:02	Normal	2.16	0	0.091309	0.133269	0	0.013472	Normal
2025-10-22 00:01:21	00:08	Normal	7.08	0	0.067749	0.179266	1.7	0.005877	Normal
2025-10-22 00:01:24	00:08	Normal	8.821	0	0.146881	0.140561	5.1	0.017293	Normal
2025-10-22 00:01:27	00:01	Normal	0.72	0	0.078491	0.156242	4	0.007569	Normal
2025-10-22 00:01:30	00:03	Normal	2.12	0	0.046722	0.173643	0	0.005971	Normal
2025-10-22 00:01:33	00:03	Normal	3.24	0	0.053192	0.171688	0	0.0036	Soft
2025-10-22 00:01:36	00:02	Normal	1.08	0	0.063141	0.178356	2.7	0.005198	Normal
2025-10-22 00:01:39	00:02	Normal	1.68	0	0.106232	0.164158	0	0.01201	Normal
2025-10-22 00:01:42	00:01	Normal	1.44	0	0.012299	0.136935	0	0.001281	Soft
2025-10-22 00:01:45	00:01	Normal	0.88	0	0.087708	0.218732	0	0.00836	Normal

What Went Well?



Programming Locations

Programming locations were very accommodating and flexible



Mild Winter

Technicians could be pulled from site work to program
Bay doors could be left open for the most part



Network Functioned as Planned and Expected

No load issues encountered



Expansion sites had greater than expected coverage footprints



PSAP cutover

Less scope vs radio programming
PSAPs completed checklists and pre-testing of VHF/Paging resources

2025-2026 911 Projects



- UCAs NG911 Strategic Plan Recommendations:
 - Ensure all Teleco Carriers are Delivering NG911-compliant Location Data with Every Call
 - Participated in NASNA working group on FCC NPRM #23-47.
 - Proposed rule would require wireline, VoIP, and relay service providers to deliver 911 calls with accurate location data in IP-based format.
 - Provide Standardized Over The Top Services via NG911 contract
 - Collaborated with the PSAP Advisory Committee to identify key technologies to enhance PSAP operations.
 - Contracted with Motorola Solutions Connectivity, Inc to provide requested future integrated technologies.
 - Fine Tune Policy Routing Rules
 - Reviewed current policy routing rules with the PSAP Advisory Committee.
 - Determined existing rules are effective and do not require changes.



- **Virtual Response Assistant (VRA)**

- Addresses staffing challenges by routing non-emergency calls to an automated system for self-service resolution.
- Capable of transferring to internal or external agencies for immediate handling when needed.
- Configurable per PSAP – can function as a basic phone tree or a fully automated solution.
- Callers may opt out to a live call taker at any time.
- Kickoff Call Status: 6 of 27 PSAPs completed.

- **Assist AI for 911**

- Unifies call handling, mapping, transcription, facility data, and notifications on a single platform, with AI providing real-time support.
- AI surfaces relevant information during live 911 calls to help telecommunicators make faster, informed decisions.
- Requires Vesta 911 update to version 8.4 (scheduled Nov–Dec 2025).
- Kickoff Call Status: 15 of 27 PSAPs completed

- **Mapping & Analytics Enhancements**

- RapidDeploy Radius Map: Statewide migration planned for 2026 (replacing Aware Map).
- RapidDeploy Eclipse: Under evaluation for statewide analytics and data insights.



2024-2025 911 Update

Console Move Requests

- 45 days advance notice required
- Radio Consoles – Contract in advance with L3H for the move.
- Phone Consoles – Contract in advance with Motorola for the move.

New Console Request

- R174-1-306. Change in Allocation of Call-taking Positions to Participating PSAPs.
- R174-1-506. Change in Allocation of Radio Consoles to Participating PSAPs.
- Send copy of request to the PSAP Advisory Committee 2025 Chair: Jeremy Hales

1

Submit a request



2

Service Needed *

Additional Console Request (Phone)
Additional Console Request (Radio)
Break Fix/Repair
BeOn Request
Console Move Request
Maintenance/Service
Radio Alias/Serial Update
Radio Programming
Other

2025 Programming Update



- Radio Programming Requests
 - Programming@uca911.org
 - QTY of radios
 - Radio ID (if this radio already has an assigned ID)
 - Serial number
 - Flash port code (if applicable)
 - Model number
- Radio Alias/Serial Number Update Requests
 - radioalias@uca911.org
 - UCA will send you a spreadsheet to update
 - Spreadsheet will be locked down (only able to delete, update alias, update serial)
- BeOn Requests - Both Radio and Phone
 - beonrequests@uca911.org
 - Number of licenses needed (less than 20 licenses without UCA executive approval)
 - Aliases for each license
 - UCA will send you 2 documents (agreement, talk group selection spreadsheet)

1

Submit a request



2

Service Needed *

Additional Console Request (Phone)

Additional Console Request (Radio)

Break Fix/Repair

BeOn Request

Console Move Request

Maintenance/Service

Radio Alias/Serial Update

Radio Programming

Other

Programming Services Fee Schedule



- With the cutover from the legacy system to P25 and all agencies now fully migrated, UCA has reinstated programming-related service fees. Please review the updated schedule below:
- **Fee Schedule**
 - **Program Radio – \$10 / radio**
This applies when UCA performs the programming to new or existing radios that are being programmed with an existing template or codeplug (matching the current flash code or feature set) to be written.
 - **Build Motorola Codeplug – \$10 / radio**
Applies when UCA builds a codeplug for a specific radio, but programming is handled by the agency or a third party.
 - **Link Kenwood Templates – \$10 / radio**
Used to link new Kenwood radios to existing UCA templates.
 - **New Template – \$116 / hour (15 minute Minimum)**
Applies to the creation or revision of a template, regardless of manufacturer.
 - **Encryption Key Loading – \$10 / radio (if separate from programming)**
For users programming their own radios without a key loader.

Questions and Answers



P25 Common Questions and Answers

- Do you anticipate a difference in audio quality with the P25 System?
- Do you anticipate a difference radio coverage with the P25 System?
 - A: Yes different, but not necessarily better or worse than the current system

