



TRWC Board of Director's Meeting

March 15, 2018 - 9:00 a.m.

Phoenix-Mesa Gateway Airport (PMGA)

Administration Building, Board Room

5835 S. Sossaman Road

Mesa, AZ 85212

Video Conference: <https://global.gotomeeting.com/join/951281397>

Audio Bridge: 1-872-240-3412, Access Code 951-281-397

Members of the public may address the Board on any item. Please complete a "Request to Speak Card", located at the entry of the room and promptly turn it in to the Executive Director or designee prior to the beginning of the meeting. There is a time limit of three minutes for comments.

Agenda

1) Call to Order and Opening Comments

- a. [Materials](#) and sign-in sheet
- b. Speaker cards
- c. Audio and video recording

2) Public Comment

Members of the public may address the Board on items not on the printed agenda. Please complete a "Request to Speak Card", located at the entry of the room and promptly turn it in to the Executive Director or designee prior to the beginning of the meeting. There is a time limit of three minutes for comments.

3) Staffing Changes

Welcome Jared Hansen, our new senior accountant. Thank you, Sherry McGlade, for your past contributions.

Welcome Cheryl Noll, our new administrative support assistant. We also thank Melanie Humphries for her support in this role.

4) Discussion and Action on Board Meeting Minutes

December 7, 2017 Board Meeting Minutes

5) Discussion and Possible Action on Pinal County Sheriff's Office (PCSO) Interoperability Request – Dale Shaw and Jay Vargo

6) Discussion and Possible Action on Communications Strategic Alliance Master IGA - Dale Shaw

- a. Official Appointment of the Coordinating Council Governing Representative and User Representative.

7) FirstNet Update - Karen Ziegler (AZDOA)

8) Discussion and Possible Action on Committee and Working Group Updates

- a. Executive Committee Update – Bill Peters (Co-chair)
- b. User Group Update – Dale Crogan

9) Discussion and Possible Action on Network Administrator Updates

- a. Finance Update – Sherry McGlade
- b. Network Updates and Performance Overview – Dale Shaw

10) Comments from the Board

An opportunity will be provided for Board members to present a brief summary of current events. The Board is not allowed to propose, discuss, deliberate or take action at the meeting on any matter in the summary, unless the specific matter is properly noticed for legal action.

11) Next TRWC Board Meetings:

All meetings are currently scheduled from 9:00 a.m. to 11:00 a.m. at PMGA.

2018 Schedule

Date	Upcoming Agenda Items
05/03/18	
09/06/18	-FY19/20 Preliminary Budget Review
12/13/18	-FY19/20 Budget Adoption

2019 Schedule

Date	Upcoming Agenda Items
03/14/19	
05/09/19	
09/12/19	-Chairman and Vice-Chairman Elections -FY20/21 Preliminary Budget Review
12/12/19	-FY20/21 Budget Adoption

12) Adjournment



TRWC Board of Director's Meeting Minutes

December 7, 2017 - 9:00 a.m.

Phoenix-Mesa Gateway Airport (PMGA)

Administration Building, Board Room

Mesa, AZ 85212

Video Conference: <https://global.gotomeeting.com/join/194407381>

Audio Bridge: 1-571-317-3122, Access Code 194-407-381

Members of the public may address the Board on any item. Please complete a "Request to Speak Card", located at the entry of the room and promptly turn it in to the Executive Director or designee prior to the beginning of the meeting. There is a time limit of three minutes for comments.

Agenda

1) Call to Order and Opening Comments

- a. Materials and sign-in sheet
- b. Speaker cards
- c. Audio and video recording

Chairman Kross called the meeting to order and welcomed the attendees. He also provided instruction on the process for public comment and reminded the participants the meeting is audio recorded.

2) Public Comment

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No Public Comment requests were received.

3) Discussion and Action on Board Meeting Minutes

November 2, 2017 Board Meeting Minutes

John Pombier motioned to approve the 11/2/2017 TRWC Board Meeting Minutes and Mike Farber seconded. All Board members who were in favor signaled by saying aye; there was no opposition, the motion passed unanimously.

4) Discussion and Possible Action on FY18/19 Proposed Budget

Sherry McGlade presented an overview of the FY 18/19 Proposed Budget as provided in the meeting materials. Cost increases reflect proposed and approved projects.

Mike Farber made a motion to approve the presented FY 18/19 Proposed Budget and Jay Ducote seconded. All Board members who were in favor signaled by saying aye; there was no opposition, the motion passed unanimously.

5) Discussion and Possible Action on Communications Strategic Alliance Master IGA

Dale Shaw presented an overview of the Communications Strategic Alliance draft as provided in the meeting materials. Dale Crogan expressed support for the Strategic Alliance approval on behalf of the User Group. Mike Farber made a motion to approve the presented Communications Strategic Alliance agreement, with minor non-substantive modifications if necessary, with the interim Coordinating Council appointment of John Pombier and Dale Crogan. The motion was seconded by Leah Hubbard Rhineheimer. All Board members who were in favor signaled by saying aye; there was no opposition, the motion passed unanimously.

6) FirstNet Update

Karen Ziegler of AZDOA and Amos Chalmers, the Representative from AT&T, discussed the ongoing Public Safety Broadband Program /FirstNet Regional Forums being conducted in December in Chandler (Tribal) and Phoenix with more possibly in January. Karen stated they were able to negotiate low unlimited rate plans that can be purchased through the State Co-op.

7) Discussion and Possible Action on Committee and Working Group Updates

a. User Group Update

Dale Crogan indicated he had no updates at this time.

8) Discussion and Possible Action on Network Administrator Updates

a. Finance Update

Sherry McGlade presented a financial update as provided in the Board packet.

b. Network Updates and Performance Overview

Randy Thompson gave a summary review of the Capital Projects and Operations Summary Staff Report as provided in the meeting materials.

9) Comments from the Board

An opportunity will be provided for Board members to present a brief summary of current events. The Board is not allowed to propose, discuss, deliberate or take action at the meeting on any matter in the summary, unless the specific matter is properly noticed for legal action.

None were made.

10) Next TRWC Board Meetings:

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2018 Schedule

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03/15/18	
05/03/18	
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2019 Schedule

Date	Upcoming Agenda Items
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05/09/19	
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12/12/19	-FY20/21 Budget Adoption

11) Adjournment



Date: March 15, 2018
To: Topaz Regional Wireless Cooperative (TRWC) Board of Directors
From: Dale Shaw, TRWC Executive Director
Bob Badgett, TRWC Executive Committee Co-chairman
William Peters, TRWC Executive Committee Co-chairman
Subject: Pinal County Interoperability Request

Recommendation

The TRWC Executive Director and Executive Committee recommend that the TRWC Board of Directors authorize the Executive Director (or appropriate delegate) to develop and execute an interoperability agreement with Pinal County.

Background & Discussion

On January 2, 2018, we received the attached request from Pinal County to become an interoperability participant with the TRWC to support radio interoperability with TRWC public safety agencies. Should the Board of Directors elect to approve this request, the Executive Director will work with Pinal County to execute the current standard interoperability agreement with minor modification where appropriate.

Fiscal Impact

No fiscal impact is anticipated beyond normal forecasted expenditures.



January 2, 2018

Dale Shaw Executive Director
TOPAZ Regional Wireless Cooperative
59 E First St.
Mesa, AZ 85211

Dear Mr. Shaw,

On behalf of the Pinal County Sheriff's Office (PCSO) I wish to formally request authorization to become an 'Interoperability Partner' with the TOPAZ Regional Wireless Cooperative. Use of your Interoperability talk groups will enhance our ability for direct communications and coordination efforts between agencies on the TRWC System and new Pinal County P25 Radio System.

PCSO is the law enforcement agency for all unincorporated areas of Pinal County. We are currently operating on VHF frequencies but have been approved to upgrade that system to a P25 Phase II compliant 700/800 MHz trunked radio system in the near future. As part of that transition we have already begun to purchase dual-band radios (VHF/700/800) and are now working with neighboring radio systems to ensure that our new radios are programmed with the appropriate interoperability talk groups.

We plan to have about 600 new radios assigned to the PCSO (300 portables and 300 mobiles), in which we would add your interoperable talk groups as permitted. It is anticipated this will be a reciprocal agreement allowing the programming of PCSO Interoperability channels into TRWC agency radios once the new system is up and running, or to facilitate a plan for ISSI connectivity between systems.

Thank you for your consideration of this request. If you have questions, please feel free to contact me as needed.

--Jay

Jay Vargo | Public Safety Systems Manager
Pinal County Information Technology
31 N. Pinal Street, Bldg. A
PO Box 726 Florence, AZ 85132
Wo. 520-866-6336 Mo. 520-709-1811
Email. Jay.Vargo@pinalcountyaz.gov

TRWC
March 15, 2018



Pinal County P25 Radio Communications System Overview

Presented by:
Jay Vargo

The System



P I N A L • C O U N T Y
wide open opportunity

Motorola Astro 25 Phase 2, 800MHz Trunked Radio System – Rel 7.16 M3

(11) Radio/Microwave Sites, (10) RF Sites

- (3) Channels (Repeaters) per RF site – 700/800MHz capable system, TDMA
- (1) Control Channel and (2) RF Channels (TDMA) - (4) Talkpaths per site

(1) Primary Master Site plus (1) Redundant ‘DSR’ Site

Dynamic Transcoding

- Dynamic transcoding allows talkgroup calls to communicate between TDMA channels and FDMA channels at different sites.

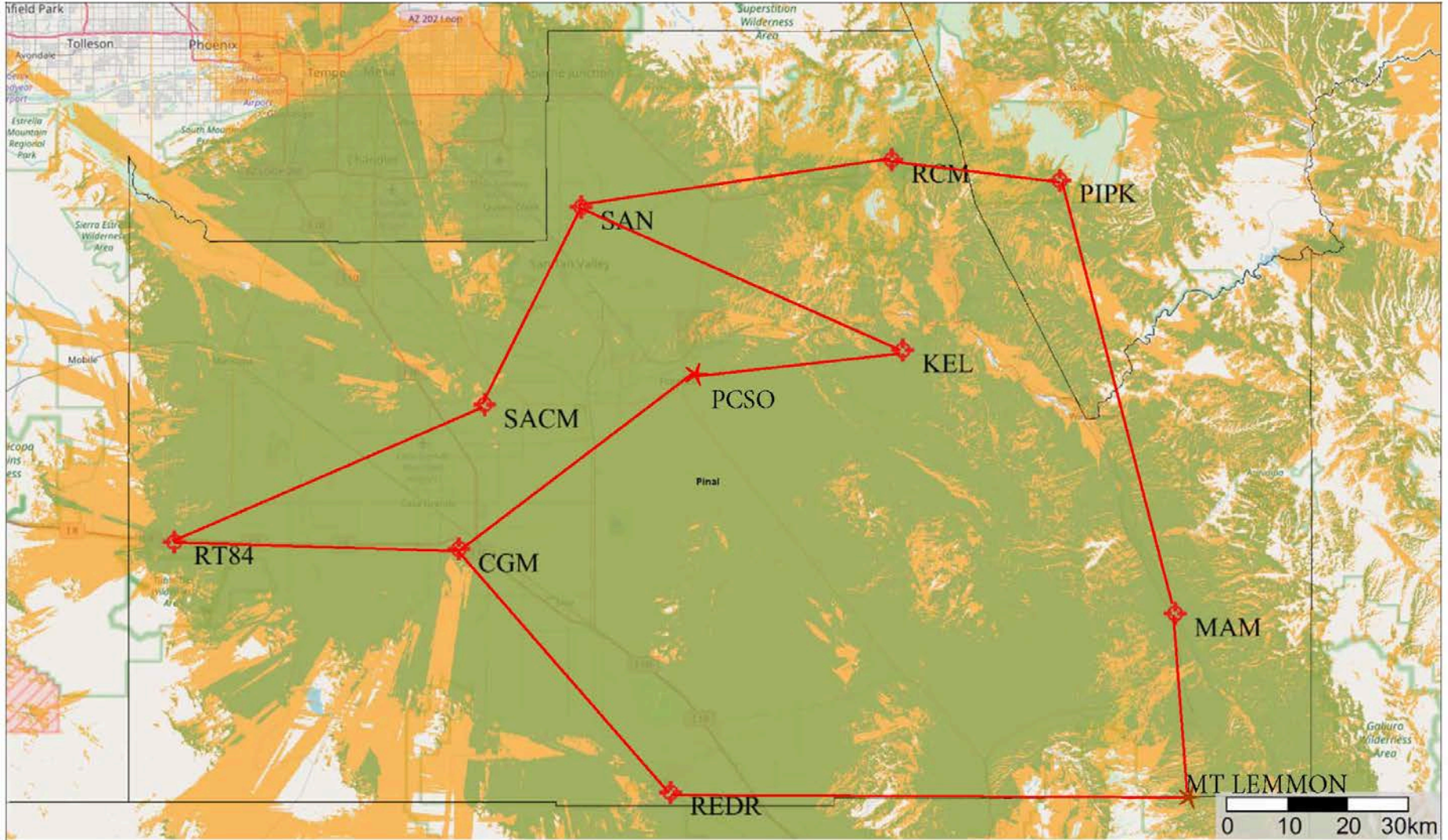
Microwave Networks Inc

- Proteus MX, 1 +1 Configuration – Two 6 GHz 30 MHz Channels on each link
- Aggregate Minimum Capacity of 150 Mbps

WAVE Mobile (Smartphone) Integration with Radio System

- Providing Broadband/Internet secure access into the Radio System for Command Staff (encrypted).

Pinal County P25 Coverage




© OpenStreetMap contributors.


Scale 1 : 893534

Solution: Pinal Coverage

Job ID: 5808279670.1.Design 5 10dB ResGain

Legend

 97% Area Inbound Portable

 97% Area inbound Mobile



ARRC

800 MHZ

Arizona Regional Review Committee

September 12, 2016

Jay Vargo
IT/Radio Communications Director
31 N. Pinal St. Bldg. A
Florence, AZ 85132

Mr. Vargo,

The Region 3 Arizona Regional Review Committee has reviewed and approved your revised application dated May 09, 2016 for a system using the following channels and sites.

Site Name	Base Transmit 1	Base Transmit 2	Base Transmit 3
Black Mountain - BM	851.0625	851.4500	856.9625
Casa Grande Mountain - CGM	851.2000	851.3500	853.8625
Kelvin - KEL	851.6500	851.8000	856.9875
Mammoth Mountain - MAM	851.1750	852.2125	853.0375
Mt. Lemmon - MTLM	851.4000	853.0625	853.9500
Pinal Peak - PIPK	851.9875	852.8625	853.7500
Resolution Copper Mine - RCM	851.9250	852.5750	855.2125
Red Rock - REDR	851.1250	852.6625	853.4750
I8 & Route 84 - RT84	851.5875	852.9250	853.7125
Sacaton Mountain - SACM	852.9750	853.2250	853.5500
San Tan - SAN	851.3750	853.1250	853.7000

Please include a copy of this letter with your application to show RPC approval.

Thank you,

Stuart Snow
ARRC Region 3 Chairperson
2441 S. 22nd Ave Phoenix, AZ 85009
602-262-7034

The System



PINAL COUNTY
wide open opportunity



PSCO Headquarters



Typical 3-Rack Equipment Configuration



Mammoth

Radio Subscribers



PINAL COUNTY
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- APX8000 Portable Radios
 - Dual Band (VHF & 7/800 MHz)
 - WiFi Enabled
 - GPS Enabled
 - P25 Phase 2 and AES Encryption
 - Over-the-Air Programming
 - Dual Mic, Noise Canceling Remote Speaker Microphone
- APX7500 and APX 8500 Mobile Radios
 - Dual Band (VHF & 7/800 MHz)
 - P25 Phase 2 and AES Encryption
 - Over-the-Air Programming





FLEETMAPPING:

<u>ZONE</u>	<u>ALIAS</u>	<u>ZONE</u>	<u>ALIAS</u>	<u>ZONE</u>	<u>ALIAS</u>
A	PCSO VHF	M	VHF MUTUAL AID	Y	800 EOC
B	POLICE	N	NARCOTICS	Z	800 PCSO
C	FIRE	O	REGIONAL O - RWC	DPS	DPS D6 MA - YRCS
D	COUNTY	P	800 COUNTY	LPMA	LPMA - YRCS
E	STATE	Q	800 PD	LEMA2	LEMA 2 - YRCS
F	FEDERAL	R	800 FIRE	YRCS	YRCS - YRCS
G	REGIONAL G - RWC	S	SAR	LEMA	LEMA - YRCS
H		T	TACTICAL	SS	STATE SAR
I		U		8M	800 MUTUAL AID
J		V	TRWC CLEAR		
K		W			
L	REGIONAL L - RWC	X	TRWC ENC		

INTERAGENCY/INTEROPERABLE ZONES

Project Timeline



Schedule:

➤ **Transition/Cut-over:**

February 27th, 2018

NOTE: During 'Cut-Over' the Pinal County Sheriff Office transitioned onto the new P25 Radio System. **Primary communications was moved to new encrypted talkgroups. PCSO radios will be dual-band and able to communicate on both existing VHF frequencies and new 800 talkgroups. PCSO Dispatch will have the capability to monitor both VHF and 800 radio systems.**

NEXT STEPS:

We will be working with the Sheriff Office and other County officials on developing governance and policy for hosting other agencies on the new System. This will include review and study of INTEROPERABILITY and INTERAGENCY communications policy. Review the **'Communications Systems Strategic Alliance' document(s)**.

TRWC:

- Identify and program interop channels/talkgroups needed for mutual aid.
- (TRWC V_deck and X_deck, T_deck, FIRE MA channels)
- Work with Motorola and City of Mesa on identifying ISSI advantages.

Questions ?



PINAL COUNTY
wide open opportunity

For any further details or questions regarding the new radio system, contact:

Jay Vargo

Public Safety Systems Manager

Pinal County

Jay.Vargo@pinalcountyaz.gov

520-866-6336

*Pinal County-wide Radio
Communications Consortium
PRCC*



FY2017/18
Financial Update

FY2017/18 Detail of Operations & Maintenance

Year to Date Through February 28, 2018

Description	Budget	Updated Forecast	YTD Forecast*	YTD Actual	\$ Var	% Var	Comments
					From YTD Forecast		
					Incr/(Decr)		
Personnel Services	\$486,600	\$322,718	\$211,008	\$211,008	\$0	0%	Brand new equipment; less issues. Motorola handled warranty work and maintenance through Oct 1.
Sub-total Personnel Services	\$486,600	\$322,718	\$211,008	\$211,008	\$0	0%	
Insurance Premiums	10,600	8,323	8,323	8,323	-	0%	
Legal Services	37,000	37,000	24,667	12,768	(11,899)	-48%	Expect to utilize for Governance Review
Temp Services	6,000	6,000	4,000	5,763	1,763	44%	
Leases and Rents - Land	24,600	24,600	21,949	21,949	-	0%	
Professional Services - Other	15,000	15,000	10,000	741	(9,259)	-93%	
Professional Services - Consulting	87,210	87,210	58,140	63,510	5,370	9%	
Utilities	72,500	60,000	40,000	35,097	(4,903)	-12%	
Telephone	5,700	5,700	3,800	1,393	(2,407)	-63%	
Repairs & Maintenance	10,400	10,400	6,933	1,246	(5,687)	-82%	
Equipment Usage (Vehicles)	22,000	22,000	14,667	11,938	(2,729)	-19%	
All Other Services	2,000	-	-	-	-	-100%	
Sub-total Services	293,010	276,233	192,479	162,728	(29,751)	-15%	

*YTD Forecast represents 8 months of operational costs plus any contractual expenses already incurred (i.e. one time payments such as Insurance Premiums, Land Rental and Motorola Contract).

FY2017/18 Detail of Operations & Maintenance

Year to Date Through February 28, 2018

Description	Budget	Updated Forecast	YTD Forecast*	YTD Actual	\$ Var	% Var	Comments
					From YTD Forecast		
					Incr/(Decr)		
Contract - Motorola SUAI	594,200	533,487	533,487	533,487	-	0%	Discount received due to late contract start
Contract - Motorola Security	330,000	341,642	341,642	341,642	(0)	0%	
Materials & Parts	20,000	9,000	6,000	873	(5,127)	-85%	
Non Cap Assets	50,000	20,000	13,333	-	(13,333)	-100%	
Software Maintenance- Juniper	22,000	22,221	22,000	22,221	221	1%	
All Other Commodities	1,000	-	-	-	-	0%	
Sub-total Commodities	1,017,200	926,350	916,462	898,223	(18,240)	-2%	
Subtotal O&M	1,796,810	1,525,301	1,319,949	1,271,959	(47,990)	-4%	
Contingency - 5% of total O&M	89,751	-	-	-	-	0%	
VHF Operations	29,700	29,700	29,700	29,700	-	0%	
Total	<u>\$1,916,261</u>	<u>\$1,555,001</u>	<u>\$1,349,649</u>	<u>\$1,301,659</u>	<u>(\$47,990)</u>	<u>-4%</u>	

*YTD Forecast represents 8 months of operational costs plus any contractual expenses already incurred (i.e. one time payments such as Insurance Premiums, Land Rental and Motorola Contract).

FY2017/18 Allocation of Operations & Maintenance

	Original Budget	Updated Forecast	YTD thru Feb 28, 2018	Variance Incease (Decrease)	% Var	Estimated Airtime	6 month Avg Airtime	FY2018-19 Budget	Estimated Airtime
COM	1,377,263	1,118,668	909,685	(208,983)	-19%	71.94%	70.45%	1,337,161	71.33%
TOG	318,566	258,752	216,510	(42,242)	-16%	16.64%	16.77%	312,979	16.48%
SFM	12,061	9,797	8,969	(828)	-8%	0.63%	0.69%	22,958	0.75%
CAJ	156,220	126,888	109,613	(17,275)	-14%	8.16%	8.52%	144,486	8.20%
TQC	6,318	5,132	6,252	1,120	22%	0.33%	0.50%	14,989	0.46%
RVFD	383	311	379	68	22%	0.02%	0.03%	1,130	0.03%
SWA	12,444	10,108	9,254	(854)	-8%	0.65%	0.72%	12,510	0.71%
AMR	2,489	2,022	2,268	246	12%	0.13%	0.18%	2,819	0.16%
FTM	28,717	23,325	26,729	3,404	15%	1.50%	2.14%	60,626	1.88%
Total	1,914,461	1,555,001	1,289,659	(265,342)	-17%	100%	100%	1,909,658	100%

Forward Look:

RECONCILIATION OF BUDGET CHANGES:

a. Salaries - savings due to recently implemented Motorola contract	\$ (95,760)
b. VHF Staff Time - Ft McDowell	27,500
c. VHF Service Contract with Motorola (allocated among Fire partners)	90,000
d. NonCapital Assets - reduced for one time purchase	(25,000)
e. Motorol contract programmed increases	33,000
f. Reduction of Contingency from 5% to 3%	(38,146)
g. Other changes	<u>3,604</u>

TOTAL VARIANCE \$ (4,802)

FY2017/18 Allocation of Projects

	Original Budget	Updated Forecast	YTD thru Feb 28, 2018	Variance Incease (Decrease)	% Var	Estimated Airtime	6 month Avg Airtime	FY2018-19 Budget	Estimated Airtime
Projects Costs									
COM	532,582	737,919	614,432	(123,487)	-17%	72.51%	71.95%	1,605,954	71.96%
TOG	122,616	170,100	149,973	(20,127)	-12%	16.77%	16.57%	371,037	16.62%
SFM	5,899	7,683	5,826	(1,857)	-24%	0.63%	0.80%	16,886	0.76%
CAJ	62,354	85,629	75,189	(10,440)	-12%	8.22%	8.42%	184,618	8.27%
TQC	3,286	4,220	3,465	(755)	-18%	0.33%	0.44%	10,357	0.46%
RVFD	224	281	217	(64)	-23%	0.02%	0.03%	675	0.03%
FTM	13,217	17,493	16,120	(1,373)	-8%	2.06%	1.79%	42,327	1.90%
Total	740,178	1,023,325	865,222	(158,103)	-15%	100.54%	100.00%	2,231,854	100.00%

<i>Forward Look:</i>	<i>PROJECTS SCHEDULED FY 2018/19</i>
<i>B. TOPAZ Voice Radio Network Upgrade (CP0090)</i>	\$ 433,828
<i>D. Radio Sites Emergency Power Upgrade (CP0094)</i>	106,200
<i>E. Florence Gardens ISR Site Lifecycle upgrade</i>	354,000
<i>F. Antenna & Transmission Lines Lifecycle Upgrade</i>	236,000
<i>H. System-of-Systems Networking</i>	619,500
<i>I. Internet Protocol Network Routers & Switches Expansion</i>	464,625
<i>J. Communications Building UPS Battery Replacement</i>	17,700
<i>Total Projects</i>	<u>\$ 2,231,853</u>

FY2017/18 Allocation of VHF Capital Project

	Original Budget	Updated Forecast	YTD thru Feb 28, 2018	Variance Incease (Decrease)	% Var	Estimated Airtime	6 month Avg Airtime	FY2018-19 Budget	Estimated Airtime
VHF Capital									
COM	331,688	331,688	340,964	9,276	3%	66.85%	66.85%	-	-
TOG	93,329	93,329	95,938	2,609	3%	18.81%	18.81%	-	-
SFM	40,239	40,239	41,364	1,125	3%	8.11%	8.11%	-	-
TQC	28,430	28,430	29,227	797	3%	5.73%	5.73%	-	-
RVFD	2,481	2,481	2,550	69	3%	0.50%	0.50%	-	-
Total	496,168	496,168	510,043	13,875	3%	100.0%	100.0%	-	-

FY2017/18 Summary Allocation of Costs

	Original Budget	Updated Forecast	YTD thru Feb 28, 2018	Variance Incease (Decrease)	% Var	Estimated Airtime	6 month Avg Airtime	FY2018-19 Budget	Estimated Airtime
Total Topaz									
COM	2,241,534	2,188,275	1,865,081	(323,194)	-15%	71.94%	70.45%	2,943,115	71.06%
TOG	534,512	522,181	462,421	(59,761)	-11%	16.64%	16.77%	684,016	16.52%
SFM	58,199	57,719	56,159	(1,560)	-3%	0.63%	0.69%	39,844	0.96%
CAJ	218,574	212,517	184,802	(27,715)	-13%	8.16%	8.52%	329,104	7.95%
TQC	38,034	37,782	38,944	1,162	3%	0.33%	0.50%	25,346	0.61%
RVFD	3,088	3,073	3,146	74	2%	0.02%	0.03%	1,805	0.04%
SWA	12,444	10,108	9,254	(854)	-8%	0.65%	0.72%	12,510	0.30%
AMR	2,489	2,022	2,268	246	12%	0.13%	0.18%	2,819	0.07%
FTM	41,934	40,818	42,849	2,031	5%	1.50%	2.14%	102,953	2.49%
Total	3,150,807	3,074,494	2,664,924	(409,570)	-13%	100%	100%	4,141,512	100%
<i>% of Original Budget</i>		<i>97.6%</i>	<i>84.6%</i>						



Date: March 15, 2018

To: TOPAZ Regional Wireless Cooperative (TRWC) Board of Directors

Through: Dale Shaw, TRWC Executive Director

From: Randy Thompson

Subject: Administrator Update

Capital Projects

- 1) **Point-to-Point Microwave Radio Wireless Backhaul Lifecycle upgrade.** This lifecycle upgrade will replace the point-to-point microwave radios that connect the radio towers in the TOPAZ network together to transport data to and from the network core. This project is budgeted in the TRWC FY2017 - 2018 capital budget. The project milestones with status and dates are shown in the Appendix. This project has been delayed due to difficulties with vendor tower subcontractor personnel receiving security clearances. These issues have been resolved, and work on the project has resumed.

- 2) **Lifecycle Upgrade for Microwave Radio Network Routers.** The network routers in the point-to-point microwave radio network control the flow of data in and out of the TOPAZ radio sites to ensure the data finds the fastest route to its destination and does not encounter congestion or other impairments that would delay delivery of data. In a radio system such as TOPAZ, minimizing these delays is critical to delivering clear voice radio communications. These network routers also automatically reroute data around disruptions in the point-to-point microwave radio network to ensure clear voice radio calls. These routers support both the 7/800 MHz and VHF radio networks. The Mesa City Council approved the purchase contract for this lifecycle upgrade on October 2, 2017, the new equipment has been received and is currently staged for testing. The project milestones with status and dates are shown in the Appendix.

- 3) **Fiscal Year 2019 Capital Projects**
 - a. **System of Systems Networking.** This project will implement the ability to network the TRWC to other Project 25 radio networks to enable “roaming” between systems to expand radio coverage without building additional radio sites. An updated quotation has been requested from Motorola Solutions. It is expected this project will kick off in July, 2018.
 - b. **Florence Gardens ISR Site Lifecycle Upgrade.** The radio base stations are obsolete and will not be supported in the next upgrade to the TOPAZ core, so the base stations need to be upgraded. An updated quotation has been requested from Motorola Solutions.
 - c. **Radio Sites Emergency Power Upgrade.** This is a five-year plan to replace the emergency generators at the TOPAZ radio sites. This is a planned lifecycle upgrade. We have difficulty getting parts for the older generators, so we want to replace rather than wait for failure. Specifications for the new generators are being developed.

TRWC Administrator Update, March 15, 2018

- d. Antenna & Transmission Lines Lifecycle Upgrade.** The antennas and the transmission lines that connect the antennas to the base stations at the TOPAZ radio sites are over 15 years old, so we need to replace them before they fail. This a two-year plan. Specifications for the new antennas and transmission lines are being developed.
- e. Internet Protocol Network Routers & Switches Expansion.** Several TOPAZ sites use network switches instead of routers; this project is a reliability improvement, as the architecture of using switches at those TOPAZ sites has not provided the expected level of network reliability. Quotations for the additional equipment have been requested.
- f. Communications Building UPS Battery Replacement.** The cost of the replacement batteries for the Communications Building Uninterruptible Power Supply are split between the TRWC and City of Mesa. This is a once every four years expense.

Operations Summary

Unscheduled Impairments – Please see the unscheduled impairments graph on page 5. Since the last Administrator update on December 7, 2017, the unimpaired system availability has been as follows:

Period	Unimpaired System Availability	Comments
November, 2017	99.999%	11/1/17: Florence Gardens site out of service 29 seconds due to network problems
December, 2017	99.675%	12/17/17: Mesa Community College site out of service 2:24:17 due to equipment failure
January, 2018	100.000%	
Calendar Year 2017	99.940%	
Fiscal Year 2018	99.950%	

Airtime and Radio Counts – the following charts are included:

- 1) Six month rolling average airtime usage by member for fiscal year 2018 through January.
- 2) Average number of radios enabled by member for calendar year 2018 through January.
- 3) Six month rolling average airtime usage by service type for fiscal year 2018 through January.
- 4) Average number of radios enabled by service type for fiscal year 2018 through January.

Peak Channel Usage – the following charts are included:

- 1) Peak channel usage for each site for November, 2017, through January 2018, is shown on the graphs at the end of this report. The following table is a summary of the number of days with an all channels in use event:

Period	Simulcast Cell	Florence Gardens	Shaw Butte	Thompson Peak
November, 2017	1	6	0	0
December, 2017	2	4	0	0
January, 2018	0	0	0	0

- a. Although all channels were in use on several occasions as shown above, no system busies have been reported by users.

TRWC Administrator Update, March 15, 2018

Other Operational Events:

- 1) The TOPAZ 800 MHz radio network backup capability was successfully tested on February 5, 2018.
- 2) The City of Mesa Communications Building (quarterly) simulated power outage test was completed successfully on January 10, 2018. This test included a successful 25-minute run of the Communications Building Uninterruptible Power Supply (UPS).

Upcoming Events:

Nothing to report.

Other News:

Nothing to report.

Appendix

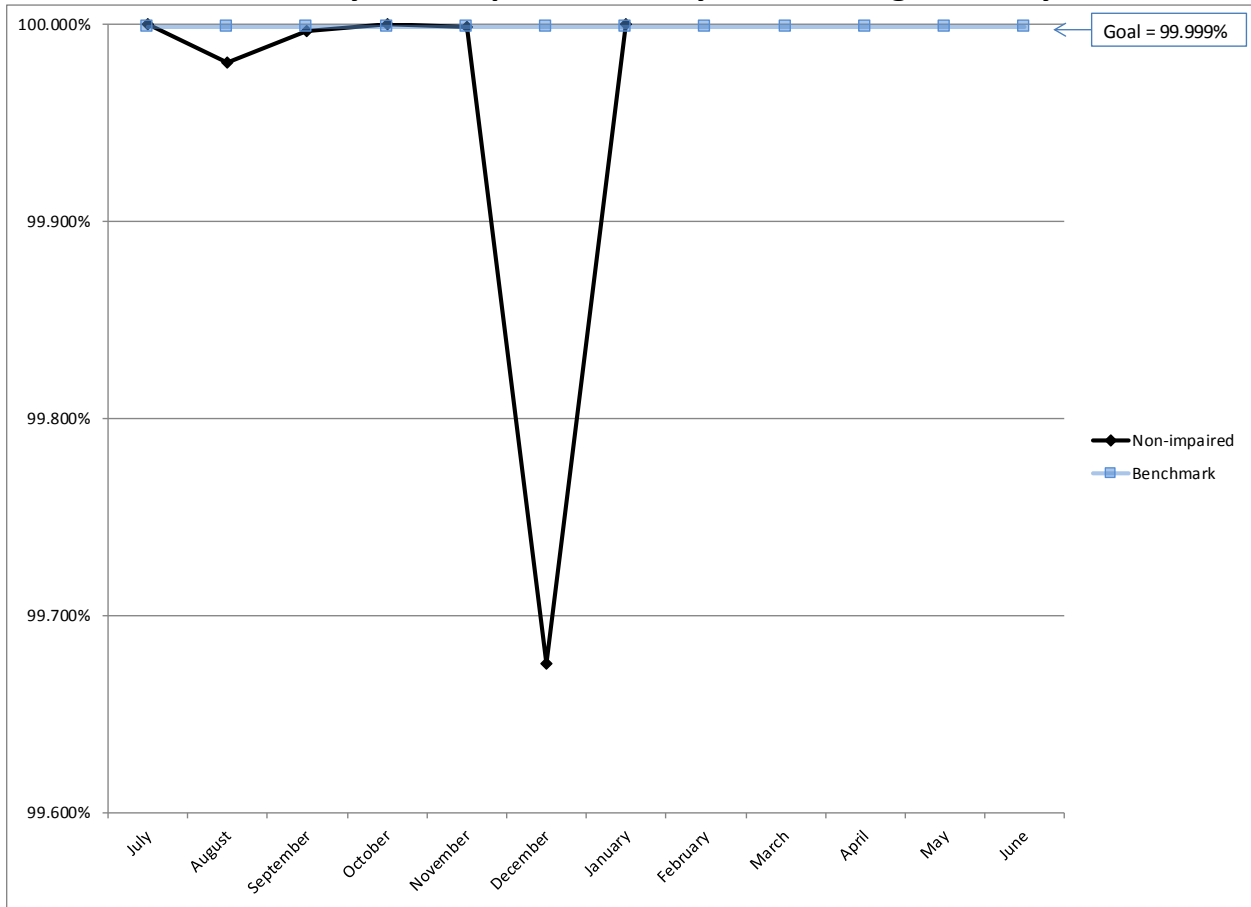
Point-to-Point Microwave Radio Wireless Backhaul Lifecycle Upgrade Schedule

Milestone	Status	Date
Contract awarded to Aviat Networks	Complete	
Equipment received	Complete	August 14, 2017
Path equipment installation, testing, and commissioning (1 path/week)	Started, Planned	Resumed February 26, 2018
Project Completion	Planned	June, 2018

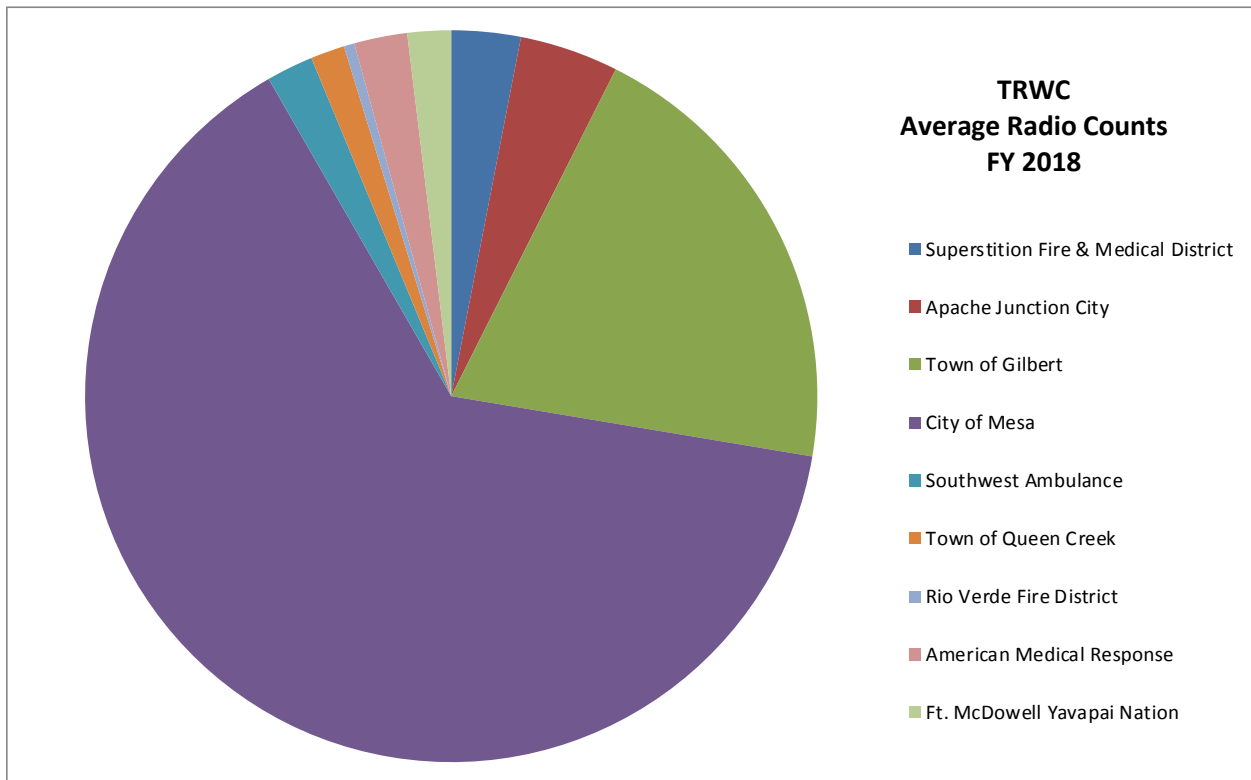
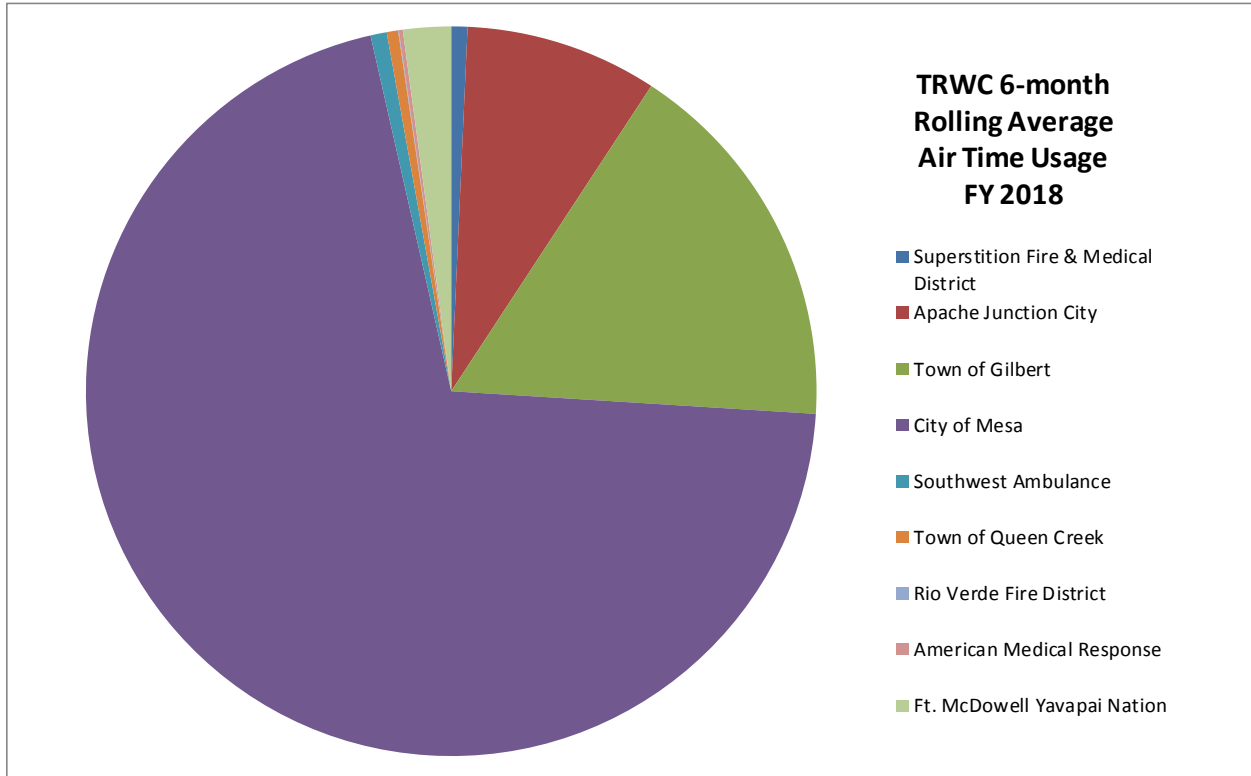
Lifecycle Upgrade for Microwave Radio Network Routers

Milestone	Status	Date
Contract awarded to Enterprise Network Solutions	Complete	October 2, 2017
Equipment ordered	Complete	
Equipment received	Complete	
Equipment staging & testing	Started	In Progress
Equipment installed & operational	Planned	After point-to-point microwave radio wireless backhaul lifecycle upgrade is complete
Project Completion	Planned	September, 2018

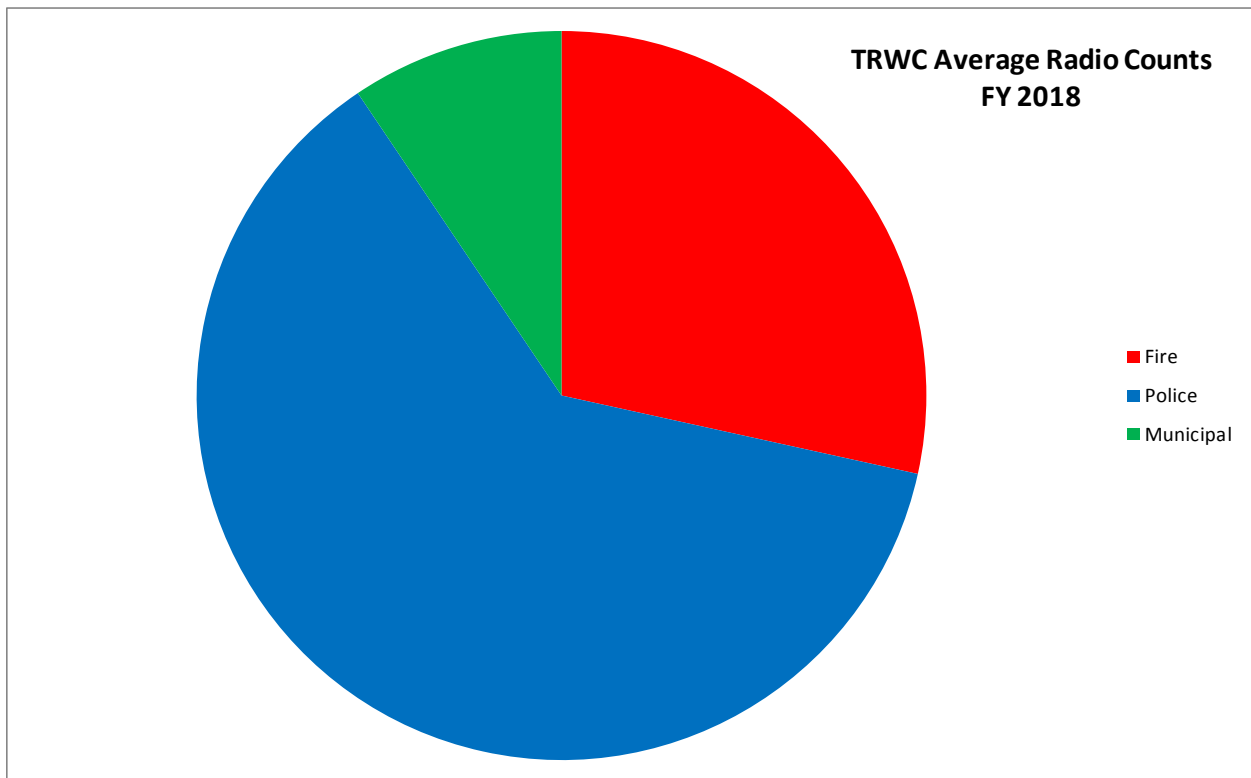
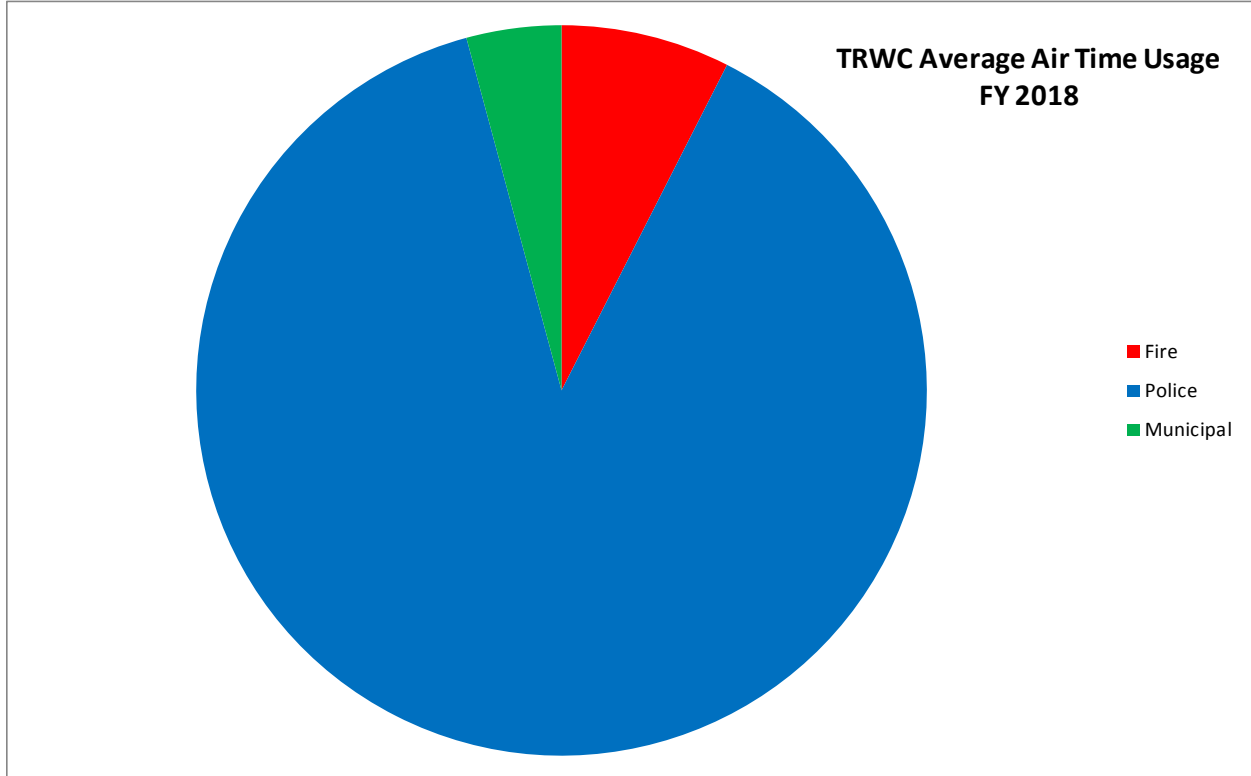
Unscheduled System Impairment, July 2017 through January 2018



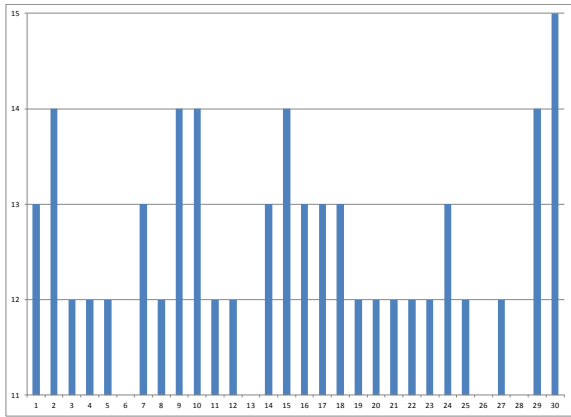
TRWC Administrator Update, March 15, 2018



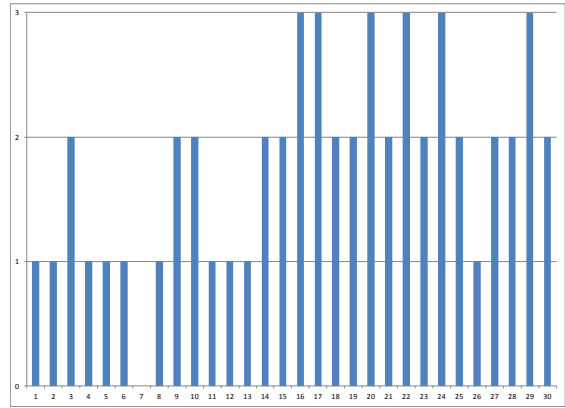
TRWC Administrator Update, March 15, 2018



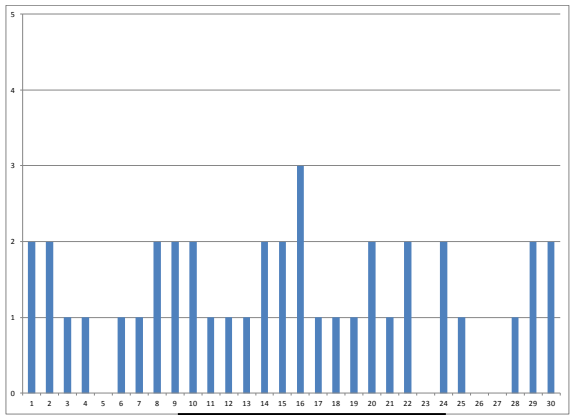
TOPAZ Peak Channel Usage, November, 2017



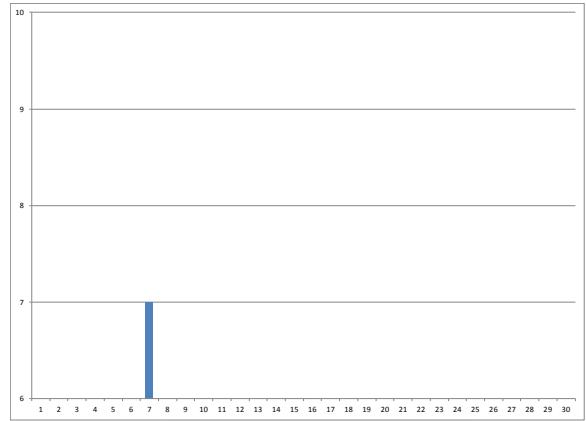
Simulcast Cell



Florence Gardens

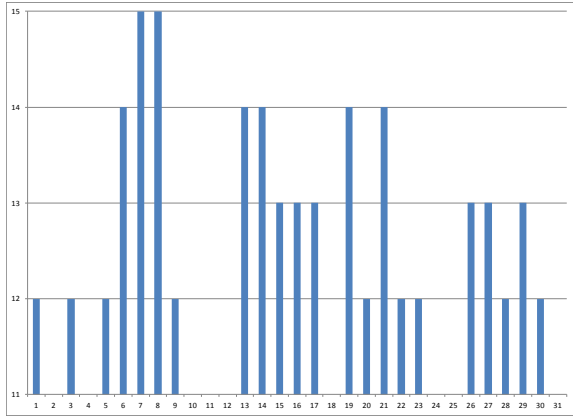


Shaw Butte

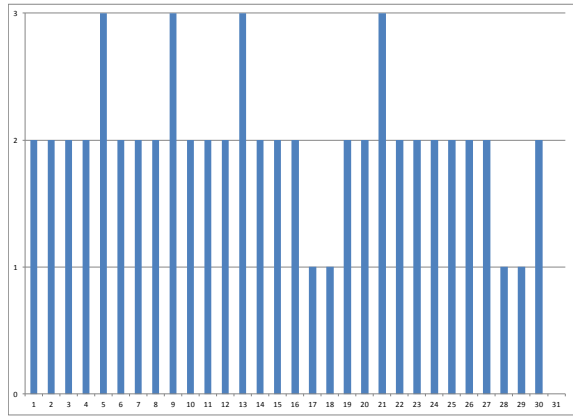


Thompson Peak

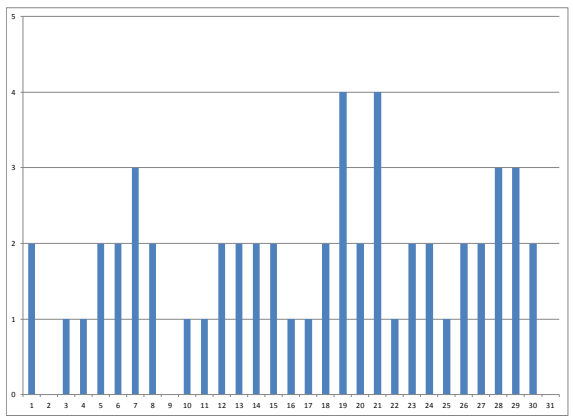
TOPAZ Peak Channel Usage, December, 2017



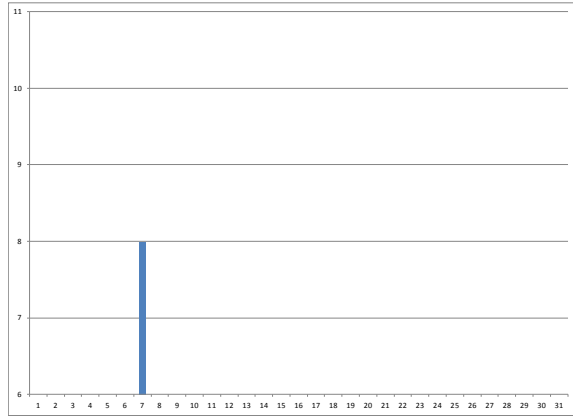
Simulcast Cell



Florence Gardens



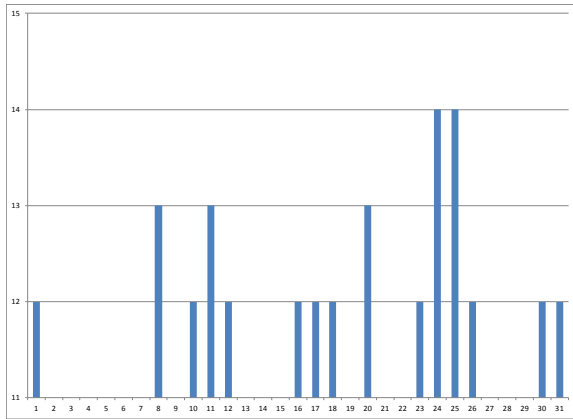
Shaw Butte



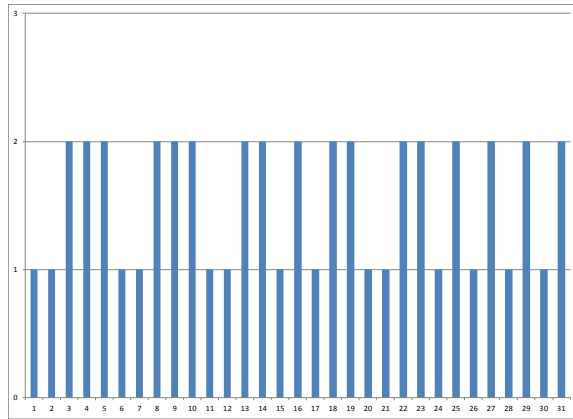
Thompson Peak

TRWC Administrator Update, March 15, 2018

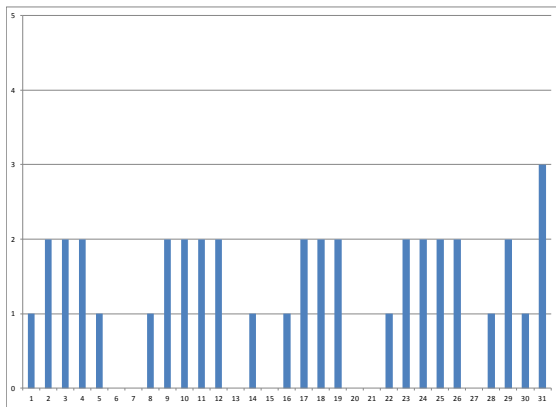
TOPAZ Peak Channel Usage, January, 2018



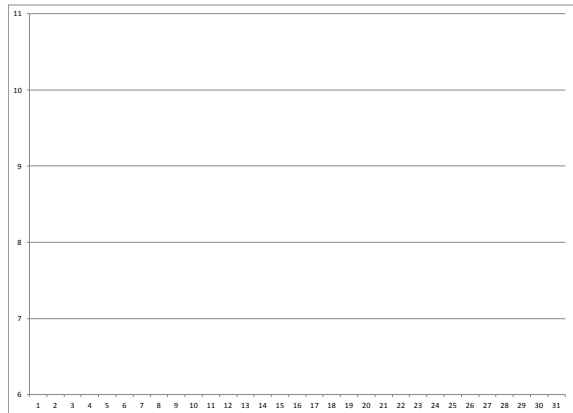
Simulcast Cell



Florence Gardens



Shaw Butte



Thompson Peak