



TRWC Board of Directors Meeting

December 15th, 2016 - 9AM
Phoenix-Mesa Gateway Airport (PMGA)
Administration Building, Board Room
5835 S. Sossaman Road
Mesa, Arizona 85212
Audio Bridge: 480-644-6120, Pin 541463

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. There is a time limit of three minutes for comments.

Agenda

1) Call to Order & Opening Comments

- a. Materials & Sign-in Sheet
- b. Speaker Cards
- c. Audio Recording

2) Executive Session

Pursuant to ARS Sec 38-431.03, Discussion of Gila River Indian Community Interoperability Agreement

3) 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 turn it in to the Executive Director prior to the beginning of the meeting. There is a time limit of three minutes for comments.

4) Discussion and Action on Board Meeting Minutes

September 29th, 2016 TRWC Board Meeting Minutes

5) Discussion and Possible Action on Gila River Indian Community Interoperability Agreement

6) Discussion and Possible Action on Committee & Working Group Updates

- a. Executive Committee Update - Bob Badgett (Co-chair)
 - Governance Material Review Status
 - FY 17/18 Proposed Budget Preparation
- b. User Group Update - Dale Crogan (Chairman)
 - VHF Project Update (Motorola attending as guest)
- c. Governance Working Group - Dale Shaw

7) Discussion and Possible Action on FY 17/18 Proposed Budget - Sherry McGlade & Randy Thompson

8) Firstnet Update - Dave Faulkner

9) Discussion and Possible Action on Network Administrator Updates:

- a. Budget & Finance Overview - Sherry McGlade
- b. Network Updates & Performance Overview - Randy Thompson

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 Meeting(s):

03/02/2017 9 to 11 am, PMGA
05/25/2017 9 to 11 am, PMGA (if necessary)
09/14/2017 9 to 11 am, PMGA
12/07/2017 9 to 11 am, PMGA

12) Adjournment



TRWC Board of Directors Meeting

September 29th, 2016 - 9AM

Phoenix-Mesa Gateway Airport (PMGA)

Administration Building, Board Room 5835 S.

Sossaman Road

Mesa, Arizona 85212

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. There is a time limit of three minutes for comments.

Agenda

1) Call to Order & Opening Comments

- a. Materials & Sign-in Sheet
- b. Speaker Cards
- c. Audio Recording
- d. Recognize Outgoing Board Members
- e. Welcome New Board Members

Chairman Kross called the meeting to order and welcomed the attendees, noted that materials were located at the back of the room, provided instruction on the process for public comment, and reminded the participants the meeting is audio recorded.

Dale Shaw noted that a cellular-based conference bridge device was being tested and David Felix from the Regional Wireless Cooperative (RWC) was asked to call in to today's meeting to test the device. Chairman Kross recognized and thanked David Felix and his staff for conferencing into the meeting.

Additionally, Chairman Kross recognized outgoing Board Members Chief Gary Bradbury and Assistant Chief Dave Montgomery and welcomed new Board Members Chief Jay Ducote, Chief Mark Openshaw, and Assistant Chief Mike Farber.

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 turn it in to the Executive Director prior to the beginning of the meeting. There is a time limit of three minutes for comments.

No Public Comment requests were received.

3) Discussion and Action on Board Meeting Minutes

March 3rd, 2016 TRWC Board Meeting Minutes

John Pombier motioned to approve the 03/03/16 TRWC Board Meeting Minutes and Mark Openshaw seconded. All were in favor; the motion passed.

4) TRWC History & Governance Overview - Dale Shaw

Chairman Kross provided a brief introduction and Dale Shaw provided an overview of TRWC history as provided in the materials.

John Pombier, Dale Shaw, and Chairman Kross made comments related to the importance of the User Group.

5) Discussion and Possible Action on Committee & Working Group Updates

a. Executive Committee Update - Bill Peters (Co-chair)

- Governance Material Review Status

Bill Peters provided a brief recap of the reason the sub-governance committee has been conducting a review of governance material. The committee has been meeting biweekly and put together a comprehensive draft, which has been given to Bill Anger for review. After legal review, the draft document will be presented to the Executive Committee. Once approved by the Executive Committee it will be presented to the Board.

- Pending FY 17/18 Budget Preparation

Mr. Peters also stated the Executive Committee is going to begin budget preparations for Fiscal Year 17/18.

b. User Group Update - Dale Crogan (Chairman)

- VHF Project Update (Motorola attending as guest)

John St. Peter from Motorola Solutions provided a summary update of the VHF Project as provided in the materials. Mr. St. Peter summarized the schedule in response to a question from Chairman Kross.

c. Governance Working Group - Dale Shaw

Dale Shaw provided an overview of the memo from Brad Hartig, RWC Chairman and John Kross, TRWC Chairman as provided in the materials. Mr. Shaw also responded to a question from Chairman Kross regarding the "coordinating council" make-up, where Mr. Shaw shared the concept that provides for representation from each participating system to include a governing board and user representative.

6) Firstnet Update - Mike Worrell & Dave Faulkner

Mike Worrell presented a summary of the materials in a PowerPoint presentation and responded to a question from Chairman Kross requesting the process for "opt-in/opt-out." Mr. Worrell said the governor will be making the decision after due diligence which will include a State RFP to compare to the Firstnet plan.

7) Discussion and Possible Action on Network Administrator Updates:

a. Budget & Finance Overview - Sherry McGlade

Sherry McGlade presented the financial results for Fiscal Year 2016 and current year financials as provided in the materials.

b. Network Updates & Performance Overview - Randy Thompson

Randy Thompson provided a summary of the network updates and performance overview as provided in the materials, responded to a question from Chairman Kross regarding no advance alert related to the five-hour impairment [on August 14, 2016], and noted emergency generators are exercised each week at each radio site.

Mr. Thompson also asked if the Board would consider an action to have the Executive Director sign a letter which details the TRWC's objections to an application made by a mobile satellite company [Higher Ground LLC] to the Federal Communications Commission (FCC) for waiver of two rules which could result in interference to point-to-point microwave radio links. This letter would then be filed with the FCC.

John Kross explained Dale Shaw already has the authority to file an objection with the FCC on behalf of the Board, but it was felt it would be good to bring this issue to the Board's attention at this scheduled meeting.

Mark Openshaw put forth a motion for directing the Executive Director to file an appropriate objection with respect to this application and Jay Ducote seconded. All were in favor; the motion passed.

8) 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.

John Kross reported that at last week's Maricopa Association of Government (MAG) committee meeting that a new committee was approved to review a proposal from Century Link, that was initiated through a Request for Proposal process at the State level, with the intent to manage and operate State-wide, the State's public safety answering points (PSAPs) which could be a significant departure to the current management and operations structure for the PSAPs. The state has taken the initiative on this to try to standardize and reduce costs for operation of some of these particular centers. As the extent of the proposal was unclear, this sub-committee will be requesting the formal and extensive proposal from Century Link. Mr. Kross acknowledged that Board Members' staffs may already be aware of this but to keep an eye on the progress. To the extent there is information to share, Mr. Kross will provide that to members of the Board.

9) Next TRWC Board Meeting(s):

December 15, 2016, 9:00 a.m. - PMGA

10) Adjournment

**AGREEMENT TO
PROVIDE FOR INTEROPERABILITY BETWEEN THE
TOPAZ REGIONAL WIRELESS COOPERATIVE NETWORK AND
THE GILA RIVER INDIAN COMMUNITY**

The Parties to this agreement (“Agreement”) are the City of Mesa, a municipal corporation duly organized and existing under the laws of the State of Arizona (“Mesa”) and the Gila River Indian Community, a federally recognized Indian tribe (the “Community”). Mesa and the Community shall be referred to individually as a “Party” and collectively as “Parties”.

RECITALS.

WHEREAS, Mesa is the Administrative Manager of the Topaz Regional Wireless Cooperative Network (“TRWC”) and is entering into this Agreement in its capacity as Administrative Manager of the TRWC and with the authorization of the TRWC Board of Directors.

WHEREAS, the Community is a federally recognized Indian tribe that provides emergency and non-emergency medical transportation services, fire protection and other safety-related services.

WHEREAS, when used in this Agreement, the “TRWC Network” shall mean the public safety/municipal communications system that includes, but is not limited to, the 700/800 MHz system originally procured and built by the City of Mesa and commonly referred to as “TOPAZ” or the Trunked Open Arizona Network.

WHEREAS, when used in this Agreement, “TRWC Member” shall include the City of Apache Junction, the Apache Junction Fire District, the City of Mesa, the Town of Gilbert, the Town of Queen Creek and any other entity that subsequently becomes a Member of the TRWC.

WHEREAS, subject to the terms and conditions of this Agreement, the Parties desire to enter into this Agreement to allow the Community use of the TRWC Network for intermittent interoperable situations or circumstances.

WHEREAS, this Agreement is entered into under the authority and pursuant to Section 4.1.5 of the TRWC Governance Agreement and subject to the terms and conditions of Section 4.1.5 of the TRWC Governance Agreement, as attached to this Agreement as Exhibit A.

AGREEMENT.

NOW, THEREFORE, in consideration of the foregoing Recitals, the mutual covenants herein contained, and good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Parties hereby agree as follows:

1. Term and Duration of Agreement; Termination

1.1. The initial term of this Agreement is one (1) year, commencing when the Agreement has been executed by all Parties (the “Effective Date”) unless otherwise terminated in

accordance with this Agreement; thereafter, this Agreement will automatically renew for terms of one (1) year unless otherwise terminated in accordance with this Agreement.

1.2. The Parties shall have the right to terminate this Agreement at any time, with or without cause, during the term of this Agreement or any extended term by first providing not less than sixty (60) days' prior written notice to the other Party.

2. Interoperability.

2.1. Community Use of TRWC Network. Subject to reasonable conditions imposed by the TRWC Board of Directors, Community employees or contractors that will be using the TRWC Network ("Community Interoperability Participants") may use the TRWC Network to support TRWC Members and the Community with intermittent interoperable situations. The TRWC will develop policies, procedures and guidelines that govern how the Community's Interoperability Participants obtain services, whether routine or emergency, establish Talkgroups, set priorities, determine roaming/site access, and operate on the TRWC Network. When using the TRWC, the Community's Interoperability Participants shall abide by all policies, procedures and guidelines established by the TRWC as a condition for using the TRWC Network.

2.2. No Community Interoperability Participant Voting Rights. The Community's Interoperability Participants shall have no TRWC voting rights or representation on the TRWC Board of Directors or any TRWC committees.

2.3. No Community Interoperability Participant Fees and Costs. No fees and costs will be assessed to the Community's Interoperability Participants for using the TRWC Network.

2.4. Restrictions on Community Interoperability Participant Use of Networks. Notwithstanding anything to the contrary in this Section 2.4, Mesa may restrict the Community's Interoperability Participants from using the TRWC Network if the use by the Community's Interoperability Participants is adversely affecting the TRWC Network. In addition, notwithstanding anything to the contrary herein, the Community's Interoperability Participants' use of the TRWC Network is conditioned upon the TRWC Network at all times having sufficient capacity to serve TRWC Members.

2.5. Interoperability Defined. As used in this Agreement the word "Interoperability" shall mean: "an essential communication link within Public Safety and Public Service wireless communications systems which permits units from two or more different agencies to interact with one another and to exchange information according to a prescribed method in order to achieve predictable results."

3. Records; Confidentiality. The Community shall treat any information about the TRWC's Network ("Network Information") as proprietary and confidential. Network Information includes, but is not limited to, technical data, engineering details, construction documents, equipment lists, programming configurations, and operational procedures. If the Community receives a request for information concerning the TRWC's Network, the Community shall promptly forward the request to Mesa for consideration and response.

4. **Conflict of Interest.** The Parties understand and acknowledge that this Agreement may be subject to cancellation under A.R.S. § 38-511 (Arizona's public employee conflict of interest law) in the event there is a conflict of interest of the type specified in A.R.S. § 38-511 by persons significantly involved in initiating, negotiating, securing, drafting or creating this Agreement.

5. **Compliance with Applicable Laws.** Each Party shall comply with all applicable laws, statutes, ordinances, executive orders, rules, regulations, standards, and codes of federal and state governments whether or not specifically referred to in this Agreement.

6. **Cooperation.** The Parties agree to make, sign and deliver all documents and to perform all acts that are necessary to fully carry out the terms of this Agreement.

7. **MESA AND TRWC DISCLAIMER OF WARRANTIES.** THE COMMUNITY ACKNOWLEDGES AND AGREES THAT NEITHER MESA NOR ANY OTHER TRWC MEMBER WARRANT THE RELIABILITY OR PERFORMANCE OF THE TRWC NETWORK. MESA DISCLAIMS ALL WARRANTIES, WHETHER WRITTEN, ORAL, IMPLIED OR STATUTORY, APPLICABLE OR RELATING TO THE EQUIPMENT, SUPPLIES, MAINTENANCE OF THE EQUIPMENT, OR OTHER ITEMS PROVIDED UNDER THE AGREEMENT BY MESA OR ANY OTHER TRWC MEMBERS, INCLUDING BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE AND THE COMMUNITY ACKNOWLEDGES THAT NO SUCH WARRANTIES HAVE BEEN MADE BY MESA OR ANY OTHER TRWC MEMBER. THE COMMUNITY ALSO HEREBY WAIVES ANY RIGHTS AND REMEDIES TO MAKE A CLAIM AGAINST MESA, THE TRWC OR ANY TRWC MEMBER INCLUDING, WITHOUT LIMITATION, ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, FOR ANY REASON WHATSOEVER, BASED ON (1) THE COMMUNITY'S USE OF THE TRWC NETWORK, OR (2) MESA OR ANY OTHER TRWC MEMBER'S OPERATION AND MAINTENANCE OF THE TRWC NETWORK. THE COMMUNITY AGREES THAT THE TRWC NETWORK AND THE COMMUNITY'S USE OF THE NETWORK IS PROVIDED ON AN "AS-IS" "WHERE IS" BASIS WITH ALL FAULTS.

8. **Indemnification.** The Community agrees to defend (with counsel reasonably acceptable to Mesa), indemnify and hold harmless Mesa and any other TRWC Member from all suits, legal or administrative proceeding liability, costs, attorney's fees, damages and penalties which may be incurred by or asserted against Mesa or any other TRWC Member arising from any accident, injury or damage resulting from the Community's use of the TRWC Network. The Community shall advance and pay all expenses, including actual attorney's fees, incurred by Mesa or any other TRWC Member in defending against any such claims, demands, liabilities and causes of action. The Community agrees to notify Mesa promptly upon receiving any notice of any such asserted claim, liability, demand or cause of action.

9. **Amendment.** This Agreement may be amended only by a written document executed by a duly authorized representative of each of the Parties.

10. **Third Parties.** All TRWC Members are intended third party beneficiaries of this Agreement. Except as otherwise provided by the first sentence of this Section 10, this

Agreement is entered into for the sole and exclusive benefit of the Parties, and no other person shall claim any implied right, benefit or interest in this Agreement. The Parties do not intend to create rights in or remedies to any third party as a beneficiary of this Agreement or of any duty, obligation, or undertaking established under this Agreement.

11. Notice. Any notice, consent or other communication (“Notice”) required or permitted under this Agreement shall be in writing and either delivered in person, sent by facsimile transmission, deposited in the United States mail, return receipt requested, or deposited with any commercial air courier or express service addressed as follows:

If intended for Mesa:

TRWC Executive Director
City of Mesa
P.O. Box 968
Mesa, AZ 85211

If intended for the Community:

Gila River Fire Department, Attn: Chief Knapp
5002 N. Maricopa Road
Chandler, Arizona 85226

With a copy that shall not constitute service to:

Gila River Indian Community
Office of General Counsel
P.O. Box 97
Sacaton, Arizona 85147

Notice shall be deemed received at the time it is personally served, on the day it is sent by facsimile transmission, on the second day after its deposit with any commercial air courier or express service or, if mailed, five (5) days after the notice is deposited in the United States mail as above provided. Any time period stated in a notice shall be computed from the time the notice is deemed received. Either party may change its mailing address, telephone or FAX number, or the person to receive the notice, by notifying the other party as provided in this Section.

Notices sent by facsimile transmission shall also be deposited in the United States mail to the recipient at the above address on the same day the facsimile transmission is sent. This requirement for duplicate notice is not intended to change the effective date of the notice sent by facsimile transmission.

12. Dispute Resolution. If a complaint, dispute or controversy arises under this Agreement, the Parties agree to negotiate, in good faith, a mutually agreeable solution. In the event the Parties cannot agree on a solution, the Parties agree to use arbitration as provided in A.R.S. § 12-1518. Nothing in this Agreement will prohibit a Party from seeking injunctive relief after first pursuing arbitration under this Paragraph.

13. Waiver. The waiver by any Party of any breach of any term, covenant or condition of this Agreement shall not be deemed a waiver of such term, covenant or condition or any subsequent breach of the same or any other term, covenant or condition of this Agreement.

14. Uncontrollable Events. No Party shall be considered to be in default in the performance of any obligations under this Agreement (other than obligations of a Party to pay costs and expenses) if failure of performance is due to an uncontrollable event. The term “uncontrollable event” means any cause beyond the control of the Party affected, including but not limited to flood, earthquake, storm, fire, epidemic, war, riot, civil disturbance or disobedience, labor dispute, and action or non-action by or failure to obtain the necessary authorizations or approvals from any governmental agency or authority or the electorate, labor or material shortage, sabotage and restraint by court order or public authority, that by exercise of due diligence and foresight the Party reasonably could not have been expected to avoid and that by exercise of due diligence it will be unable to overcome. A Party that is rendered unable to fulfill any obligation by reason of an uncontrollable event shall exercise due diligence to remove such inability with all reasonable dispatch.

15. Assignment and Binding Effect. The Community may not assign its rights or obligations under this Agreement without the prior written consent of Mesa which consent may be granted or denied at Mesa’s sole and absolute discretion. Except as otherwise provided in the first sentence of this Section 14, this Agreement shall be binding upon and shall inure to the benefit of the Parties and their respective successors and assigns.

16. Entire Agreement. This Agreement contains the entire agreement and understanding among the Parties regarding the subject matter herein and supersedes and replaces all related prior negotiations, agreements and proposed agreements, written or oral. Each Party acknowledges that no other Party, nor any agent or attorney of any Party, has made any promise, representation, or warranty whatsoever, expressed or implied, not contained in this Agreement and acknowledges that this Agreement has not been executed in reliance on any promise, representation or warranty not contained in this Agreement. This Agreement shall not be amended, modified or supplemented at any time unless in writing.

17. Governing Law. This Agreement shall be governed by and construed in accordance with the laws of the State of Arizona applicable to contracts executed and intended to be performed entirely within the State of Arizona by residents of the State of Arizona and Mesa consents to the jurisdiction of such courts. Subject to the last sentence of this Section 17, any action at law, suit in equity or judicial proceeding for the enforcement of this Agreement or any provision therefore shall be instituted only in the state or federal district courts of Maricopa County, Arizona. The Community agrees to waive its sovereign immunity solely and exclusively for the strictly limited purpose of resolving a claim or dispute that may arise with respect to the interpretation or enforcement of this Agreement. In addition, this Agreement shall not become effective until and unless the Community 1) waives its sovereign immunity solely and exclusively for the strictly limited purpose of resolving a claim or dispute that may arise with respect to the interpretation or enforcement of this Agreement and 2) consents to the jurisdiction of the federal or state courts authorized in this Section 17 and subject to the last sentence of this Section 17 solely and exclusively for the strictly limited purpose of resolving a claim or dispute

that may arise with respect to the interpretation or enforcement of this Agreement. The Community waives its sovereign immunity for the limited purpose of suit (including any judgment) brought by a Party in the United States District Court of Arizona for disputes between the Parties arising from this Agreement. If the United States District Court for the District of Arizona determines that it does not have jurisdiction to such dispute, the Community hereby waives its sovereign immunity for the limited purpose of suit (including enforcement of any judgment) brought by a Party in the Superior Court of Arizona, Maricopa County, for disputes between the Parties arising from this Agreement.

18. Severability. Except for each Party's right to terminate this Agreement pursuant to Section 1.2, if any provision of this Agreement is declared void or unenforceable by a court of competent jurisdiction, the provision shall be severed from this Agreement, which shall otherwise remain in full force and effect if the remaining provisions permit the Parties to obtain the practical benefits of this Agreement. If any law or court of competent jurisdiction prohibits or excuses any Party from undertaking any contractual commitment to perform any act under this Agreement, this Agreement shall remain in full force and effect, but the provisions requiring such action shall be deemed to permit the Party to take such action at its discretion, if such a construction is permitted by law.

19. Attorneys Fees. The prevailing Party in any litigation or arbitration arising out of this Agreement shall be entitled to the recovery of its reasonable attorneys' fees, court costs and other litigation related costs and fees from the other Party.

20. Headings. Section headings are inserted in this Agreement solely for convenience and the section headings shall not by themselves alter, modify, limit, expand or otherwise affect the meaning of any provision of this Agreement.

21. Counterparts. This Agreement may be signed in counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

22. Recitals Incorporated. The Parties acknowledge that the Recitals to this Agreement are true, accurate and correct, and are hereby incorporated into and made a part of the operative provisions of this Agreement as if fully set forth therein without difference or distinction.

23. Personnel. This Agreement is not intended to and will not constitute, create, give rise to, or otherwise recognize a joint venture, partnership or formal business association or organization of any kind between the Parties. No employee, agent, or servant of a Party shall be deemed to be an employee, agent or servant of the other Party. Except as otherwise provided by Sections 7 and 8 of this Agreement, each Party will be solely and entirely responsible for its acts and the acts of its employees, agents, servants, subcontractors, and volunteers during the performance of this Agreement. Each Party will have total responsibility for all salaries, wages, bonuses, retirement withholdings, worker's compensation, occupational disease compensation, unemployment compensation, other employment compensation, other employee benefits, and all employer's taxes and premiums concerning the persons who are supplied by that Party in the performance of this Agreement, and each Party agrees to hold the other Party harmless from any liability thereof.

24. E-Verify Laws. To the extent applicable under A.R.S. § 41-4401 and 23-214, the Community represents and warrants compliance with all federal immigration laws and regulations that relate to their employees and their compliance with applicable E-verify requirements of A.R.S. 23-214(A). Breach of the above-mentioned warranty shall be deemed a material breach of the Agreement and may result in the termination of the Agreement by Mesa.

25. Authority to Execute. The individuals executing this Agreement on behalf of the Parties hereto represent that they have authority to execute this Agreement on behalf of such Parties, and represent that upon execution, this Agreement shall be binding and no further action is or shall be necessary to make the Agreement enforceable in its entirety.

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed by their duly authorized officers.

CITY OF MESA

By: _____

Date: _____

Title: _____

FOR THE GILA RIVER INDIAN COMMUNITY

Stephen R. Lewis, Governor

Date: _____

APPROVED AS TO FORM

Linus Everling, General Counsel

Date: _____

FOR THE FIRE DEPARTMENT

Thomas Knapp, Chief, Fire Department

Date: _____



Date: December 15, 2016
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: Fiscal Year 2017/2018 Budget

Recommendation

The TRWC Executive Director and Executive Committee recommend the approval of the Proposed TRWC Budget (attached) in the amount of \$3,150,807 for Fiscal Year 2017/2018.

Background & Discussion

The attached Proposed Budget for Fiscal Year 2017/2018 has been under review and endorsed by the TRWC Executive Committee. When compared to the current 2016/2017 Fiscal Year Budget, the proposed Operating & Maintenance expenses will increase by \$284,336 (primarily due to additional contracted services for system security and other services) and Capital will increase by \$117,518 (primarily due to a change in timing of the Wireless Backhaul Lifecycle Upgrade project) - with a net overall Budget increase of \$401,854.

Details regarding the proposed additional contracted services and the TRWC Capital Plan are included in the attached supplemental material to the Proposed Budget.

Fiscal Impact

The Proposed Budget represents the total planned contribution by all member agencies for the ongoing operation, maintenance, and improvement of the TRWC radio network. Each member agency will be invoiced as actual expenditures occur on a monthly basis using the cost allocation methodology outlined in the Proposed Budget.



PROPOSED FISCAL YEAR 2017 / 2018 BUDGET

DETAIL OF OPERATIONS, MAINTENANCE AND CAPITAL

As Endorsed by the TRWC Executive Committee

**TRWC Operating & Maintenance Budget And Capital Improvement Costs
RECONCILIATION BETWEEN FY 16/17 APPROVED AND 17/18 PROPOSED BUDGET**

	<u>FY 16/17 APPROVED</u>	<u>FY 17/18 PROPOSED</u>	<u>Increase (Decrease)</u>	
1. LABOR	\$ 492,000	\$ 486,600	\$ (5,400)	-1.1%
2. NON LABOR	1,138,125	1,427,861	289,736	25.5%
4. TOTAL OPERATING & MAINTENANCE BUDGET	<u>\$ 1,630,125</u>	<u>\$ 1,914,461</u>	<u>\$ 284,336</u>	<u>17.4%</u>
5. MONTHLY AIRTIME HOURS	1,019	965		
6. RECONCILIATION OF BUDGET CHANGES:				
a. Salaries - 5% estimated increase offset by Motorola Services			\$ (5,400)	
b. New Vinco Contract - tower service and repair			15,000	
c. New Proxim Contract - equipment no longer under warranty			7,280	
d. New Motorola Contract-Security Monitoring and Onsite Support			330,000	
e. Reduction in Motorola contract for current services			(57,000)	
f. Materials & Supplies/NonCap Assets			(27,600)	
g. Professional Services -Grants			(8,100)	
h. VHF Service Contract with Motorola (allocated among Fire partners)			29,700	
i. Other changes			456	
			<u>\$ 284,336</u>	
TOTAL VARIANCE:			<u>\$ 284,336</u>	
7. O&M Cost Per Airtime Hour	\$133	\$165	\$32	
8. Capital Network Reliability Improvements	<u>\$ 1,118,828</u>	<u>\$ 1,236,346</u>	<u>\$ 117,518</u>	<u>11%</u>
Cost Per Airtime Hour	\$91	\$107	\$15	
PROPOSED BUDGET (O&M + Capital)		<u>\$ 3,150,807</u>	<u>\$ 401,854</u>	

**TRWC Operating & Maintenance Budget
Summary of Labor and Non-labor**

		FY 16/17 APPROVED	FY 17/18 PROPOSED	FORECAST					
				FY 18/19	FY 19/20	FY 20/21	FY 21/22	FY 22/23	FY 23/24
ESCALATION FACTOR				3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
Labor	Salaries and Wages	\$ 492,000	\$ 486,600	\$ 501,198	\$ 516,234	\$ 531,721	\$ 547,673	\$ 564,103	\$ 581,026
	Total Labor	<u>\$ 492,000</u>	<u>\$ 486,600</u>	<u>\$ 501,198</u>	<u>\$ 516,234</u>	<u>\$ 531,721</u>	<u>\$ 547,673</u>	<u>\$ 564,103</u>	<u>\$ 581,026</u>
ESCALATION FACTOR				2.30%	2.30%	2.30%	2.30%	2.30%	2.30%
GENERAL & ADMINISTRATIVE - OTHER SERVICES									
	Temp Services	\$ 90,000	\$ 6,000	\$ 6,138	\$ 6,279	\$ 6,424	\$ 6,571	\$ 6,722	\$ 6,877
	Prof Services - Consulting	-	87,210	89,216	91,268	93,367	95,514	97,711	99,959
	Prof Services - Legal	37,000	37,000	37,851	38,722	39,612	40,523	41,455	42,409
	Prof Services - Other	23,100	15,000	15,345	15,698	16,059	16,428	16,806	17,193
	Ins. Premiums - Agencies	10,600	10,600	10,844	11,093	11,348	11,609	11,876	12,150
	Utilities	72,500	72,500	72,500	74,168	75,873	77,618	79,404	81,230
	Telephone	5,700	5,700	5,831	5,965	6,102	6,243	6,386	6,533
	Repairs & Maint	10,400	10,400	10,639	10,884	11,134	11,390	11,652	11,920
	Equipment Usage (Vehicles)	20,000	22,000	22,506	23,024	23,553	24,095	24,649	25,216
	Shaw Butte & Florence Gardens	24,600	22,800	23,324	23,861	24,410	24,971	25,545	26,133
	All Other Services	2,000	2,000	2,046	2,093	2,141	2,190	2,241	2,292
	TOTAL OTHER SERVICES	<u>\$ 295,900</u>	<u>\$ 291,210</u>	<u>\$ 296,240</u>	<u>\$ 303,054</u>	<u>\$ 310,024</u>	<u>\$ 317,155</u>	<u>\$ 324,449</u>	<u>\$ 331,912</u>
GENERAL & ADMINISTRATIVE - COMMODITIES									
	Non Cap Assets	\$ 60,000	\$ 50,000	\$ 51,150	\$ 52,326	\$ 53,530	\$ 54,761	\$ 56,021	\$ 57,309
	Contract - Preventative Motorola	645,000	594,200	597,400	601,600	605,800	610,000	615,200	629,350
	Contract - Security Monitoring Motorola	-	330,000	334,000	350,000	361,000	372,000	383,000	391,809
	Software Maint-Mainsaver,Juniper	21,000	22,000	22,506	23,024	23,553	24,095	24,649	25,216
	Materials & Repair Parts	37,600	20,000	38,465	39,349	40,255	41,180	42,128	43,096
	All Other Commodities	1,000	1,000	1,023	1,047	1,071	1,095	1,120	1,146
	TOTAL COMMODITIES	<u>\$ 764,600</u>	<u>\$ 1,017,200</u>	<u>\$ 1,044,544</u>	<u>\$ 1,067,346</u>	<u>\$ 1,085,208</u>	<u>\$ 1,103,132</u>	<u>\$ 1,122,118</u>	<u>\$ 1,147,926</u>
OTHER BUDGET ITEMS									
	PROPOSED CONTINGENCY - 5%	\$ 77,625	\$ 89,751	\$ 92,099	\$ 94,332	\$ 96,348	\$ 98,398	\$ 100,533	\$ 103,043
	VHF OPERATIONS (special assessment)	-	29,700	120,138	123,813	127,567	131,404	135,326	139,386
	TOTAL OTHER BUDGET ITEMS	<u>\$ 77,625</u>	<u>\$ 119,451</u>	<u>\$ 212,237</u>	<u>\$ 218,145</u>	<u>\$ 223,915</u>	<u>\$ 229,802</u>	<u>\$ 235,859</u>	<u>\$ 242,429</u>
	Total Operating & Maintenance	<u>\$ 1,630,125</u>	<u>\$ 1,914,461</u>	<u>\$ 2,054,219</u>	<u>\$ 2,104,779</u>	<u>\$ 2,150,868</u>	<u>\$ 2,197,761</u>	<u>\$ 2,246,529</u>	<u>\$ 2,303,293</u>

**TRWC Operating & Maintenance Budget
Summary of Labor and Non-labor**

	FY 16/17	FY 17/18	FORECAST					
	APPROVED	PROPOSED	FY 18/19	FY 19/20	FY 20/21	FY 21/22	FY 22/23	FY 23/24
Total Operating & Maintenance	\$ 1,630,125	\$ 1,914,461	\$2,054,219	\$2,104,779	\$2,150,868	\$2,197,761	\$2,246,529	\$2,303,293
AIRTIME HOURS 6 MTH AVG AS OF 9/30/15 and 9/30/16	1,019	965	1,000	1,000	1,000	1,000	1,000	1,000
O&M - AIRTIME PERCENTAGE (1)								
Mesa		71.94%	71.94%	71.94%	71.94%	71.94%	71.94%	71.94%
Gilbert		16.64%	16.64%	16.64%	16.64%	16.64%	16.64%	16.64%
Superstition Fire & Medical		0.63%	0.63%	0.63%	0.63%	0.63%	0.63%	0.63%
Apache Junction		8.16%	8.16%	8.16%	8.16%	8.16%	8.16%	8.16%
Ft McDowell		1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%
Queen Creek		0.33%	0.33%	0.33%	0.33%	0.33%	0.33%	0.33%
Southwest Ambulance		0.65%	0.65%	0.65%	0.65%	0.65%	0.65%	0.65%
American Medical Response		0.13%	0.13%	0.13%	0.13%	0.13%	0.13%	0.13%
Rio Verde		0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
TOTAL		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
VHF SPECIAL ASSESSMENT (2)								
Mesa Fire & Medical		66.85%	66.85%	66.85%	66.85%	66.85%	66.85%	66.85%
Gilbert Fire		18.81%	18.81%	18.81%	18.81%	18.81%	18.81%	18.81%
Superstition Fire & Medical		8.11%	8.11%	8.11%	8.11%	8.11%	8.11%	8.11%
Queen Creek Fire		5.73%	5.73%	5.73%	5.73%	5.73%	5.73%	5.73%
Rio Verde Fire		0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
TOTAL		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
ANNUAL ESTIMATED REVENUE: OPERATING & MAINTENANCE								
Mesa	\$ 1,375,752	\$1,471,689	\$1,507,876	\$1,540,841	\$1,574,381	\$1,609,265	\$1,649,894	
Gilbert	319,211	344,429	352,922	360,673	368,559	376,759	386,293	
Superstition Fire & Medical	14,283	21,928	22,521	23,092	23,675	24,276	24,937	
Apache Junction	153,796	157,821	161,647	165,101	168,615	172,274	176,575	
Ft McDowell	28,271	29,011	29,714	30,350	30,995	31,668	32,459	
Queen Creek	7,922	13,266	13,632	13,986	14,348	14,721	15,128	
Southwest Ambulance	12,251	12,572	12,876	13,151	13,431	13,723	14,065	
American Medical Response	2,450	2,514	2,575	2,630	2,686	2,745	2,813	
Rio Verde	525	988	1,015	1,042	1,070	1,099	1,130	
TOTAL	\$ 1,914,461	\$2,054,218	\$2,104,778	\$2,150,866	\$2,197,760	\$2,246,530	\$2,303,294	
MONTHLY FEE PER AIRTIME UNIT: OPERATING & MAINTENANCE	\$ 165	\$ 171	\$ 175	\$ 179	\$ 183	\$ 187	\$ 192	

(1) Normal partner assessments are allocated based on recent rolling 6 month airtime averages and are subject to change based on actual monthly data.

(2) Agency cost distribution for the Hazard Zone Communication VHF Special Assessment is based on 12 months average Airtime as of March 31, 2015.

TRWC Capital Improvement Planning

Capital Improvement Costs	APPROVED		PROPOSED		FORECASTED						TOTAL 9					
	FY 16/17		FY 2017/18		FY 18/19	FY 19/20	FY 20/21	FY 21/22	FY 22/23	FY 23/24	FY 24/25	YEARS				
Network Reliability Improvements:																
A. Fire VHF (CP0305)	\$	685,000	\$	496,168	\$	-	\$	-	\$	-	\$	-	\$ 1,181,168			
B. TOPAZ Voice Radio Network Upgrade (CP0090)		433,828		433,828		433,828		433,828					1,735,312			
C. Wireless Backhaul (Microwave) Network Upgrade (CP0093)				306,350									306,350			
D. Radio Sites Emergency Power Upgrade (CP0094)						90,000		90,000		90,000		90,000	45,000	585,000		
E. Florence Gardens ISR Site Lifecycle upgrade						300,000							300,000			
F. Antenna & Transmission Lines Lifecycle Upgrade						200,000		200,000					400,000			
G. Internet Protocol Network Routers & Switches Lifecycle								207,500		207,500			415,000			
H. System-of-Systems Networking						500,000							500,000			
I. Internet Protocol Network Routers & Switches Expansion						420,000							420,000			
J. Southeast Queen Creek Expansion Site								400,000		400,000			800,000			
K. Southeast Apache Junction Expansion Site										425,000		425,000	850,000			
L. Northeast Mesa Expansion Site												450,000	450,000			
													-	900,000		
Total Improvements		<u>\$ 1,118,828</u>		<u>\$ 1,236,346</u>		<u>\$ 1,943,828</u>		<u>\$ 1,331,328</u>		<u>\$ 1,122,500</u>		<u>\$ 965,000</u>	<u>\$ 540,000</u>	<u>\$ 90,000</u>	<u>\$ 45,000</u>	<u>\$ 8,392,830</u>
Normal Assessment to Partners (1)																
Mesa	72.96%	\$ 316,525	72.51%	\$ 536,670	\$ 1,409,383	\$ 965,287	\$ 813,875	\$ 699,678	\$ 391,530	\$ 65,255	\$ 32,627	\$ 5,230,831				
Gilbert	17.02%	73,828	16.77%	124,134	325,996	223,275	188,252	161,838	90,562	15,094	7,547	1,210,526				
Superstition Fire & Medical	0.42%	1,837	0.63%	4,700	12,342	8,453	7,127	6,127	3,429	571	286	44,873				
Apache Junction	7.22%	31,316	8.22%	60,873	159,863	109,490	92,316	79,363	44,410	7,402	3,701	588,735				
Ft McDowell	2.06%	8,922	1.51%	11,190	29,387	20,127	16,970	14,589	8,164	1,361	680	111,389				
Queen Creek	0.30%	1,312	0.33%	2,462	6,465	4,428	3,733	3,210	1,796	299	150	23,855				
Rio Verde	0.02%	87	0.02%	149	392	268	226	195	109	18	9	1,454				
SubTotal	<u>100.00%</u>	<u>\$ 433,828</u>	<u>100.00%</u>	<u>\$ 740,178</u>	<u>\$ 1,943,828</u>	<u>\$ 1,331,328</u>	<u>\$ 1,122,500</u>	<u>\$ 965,000</u>	<u>\$ 540,000</u>	<u>\$ 90,000</u>	<u>\$ 45,000</u>	<u>\$ 7,211,662</u>				
Special Assessment to Partners (VHF)(2)																
Mesa Fire & Medical	66.85%	\$ 457,923	66.85%	\$ 331,688	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 789,611				
Gilbert Fire	18.81%	128,849	18.81%	93,329	-	-	-	-	-	-	-	222,178				
Superstition Fire & Medical	8.11%	55,554	8.11%	40,239	-	-	-	-	-	-	-	95,793				
Queen Creek Fire	5.73%	39,251	5.73%	28,430	-	-	-	-	-	-	-	67,681				
Rio Verde Fire	0.50%	3,425	0.50%	2,481	-	-	-	-	-	-	-	5,906				
SubTotal	<u>100.00%</u>	<u>\$ 685,000</u>	<u>100.00%</u>	<u>\$ 496,168</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ 1,181,168</u>				
Total Assessment to Partners																
Mesa	69.22%	\$ 774,448	70.24%	\$ 868,358	\$ 1,409,383	\$ 965,287	\$ 813,875	\$ 699,678	\$ 391,530	\$ 65,255	\$ 32,627	\$ 6,020,441				
Gilbert	18.12%	202,677	17.59%	217,463	325,996	223,275	188,252	161,838	90,562	15,094	7,547	1,432,704				
Superstition Fire & Medical	5.13%	57,390	3.63%	44,939	12,342	8,453	7,127	6,127	3,429	571	286	140,666				
Apache Junction	2.80%	31,316	4.92%	60,873	159,863	109,490	92,316	79,363	44,410	7,402	3,701	588,735				
Ft McDowell	0.80%	8,922	0.91%	11,190	29,387	20,127	16,970	14,589	8,164	1,361	680	111,389				
Queen Creek	3.63%	40,563	2.50%	30,892	6,465	4,428	3,733	3,210	1,796	299	150	91,536				
Rio Verde	0.31%	3,512	0.21%	2,630	392	268	226	195	109	18	9	7,360				
Total	<u>100.00%</u>	<u>\$ 1,118,828</u>	<u>100.00%</u>	<u>\$ 1,236,346</u>	<u>\$ 1,943,828</u>	<u>\$ 1,331,328</u>	<u>\$ 1,122,500</u>	<u>\$ 965,000</u>	<u>\$ 540,000</u>	<u>\$ 90,000</u>	<u>\$ 45,000</u>	<u>\$ 8,392,830</u>				

(1) Normal partner assessments are allocated based on recent rolling 6 month airtime averages and are subject to change based on actual monthly data.

(2) Agency cost distribution for the Hazard Zone Communication VHF Special Assessment is based on 12 months average Airtime as of March 31, 2015.

TRWC Cash Flow: Assessments per Partner
 PROJECTED CASH FLOW FOR FISCAL YEAR 2017 / 2018

O&M CASH FLOWS

MONTH	MESA	GILBERT	SFM	CAJ	FT MCDOWELL	QUEEN CREEK	SWA	AMR	RIO VERDE
July	\$ 724,110	\$ 167,572	\$ 6,528	\$ 81,946	\$ 15,064	\$ 3,456	\$ 6,528	\$ 1,306	\$ 213
August	59,240	13,785	705	6,532	1,201	406	520	104	28
September	59,240	13,785	705	6,532	1,201	406	520	104	28
October	59,240	13,785	705	6,532	1,201	406	520	104	28
November	59,240	13,785	705	6,532	1,201	406	520	104	28
December	59,240	13,785	705	6,532	1,201	406	520	104	28
January	59,240	13,785	705	6,532	1,201	406	520	104	28
February	59,240	13,785	705	6,532	1,201	406	520	104	28
March	59,240	13,785	705	6,532	1,201	406	520	104	28
April	59,240	13,785	705	6,532	1,201	406	520	104	28
May	59,240	13,785	705	6,532	1,201	406	520	104	28
June	59,240	13,785	705	6,532	1,201	406	520	104	28
Total	\$ 1,375,752	\$ 319,211	\$ 14,283	\$ 153,796	\$ 28,271	\$ 7,922	\$ 12,251	\$ 2,450	\$ 525
Total O&M Project Cash Flow									\$ 1,914,461

CAPITAL CASH FLOWS

MONTH	MESA	GILBERT	SFM	CAJ	FT MCDOWELL	QUEEN CREEK	RIO VERDE
July	\$ 536,670	\$ 124,134	\$ 4,700	\$ 60,873	\$ 11,190	\$ 2,462	\$ 149
August	-	-	-	-	-	-	-
September	-	-	-	-	-	-	-
October (VHF)	331,688	93,329	40,239	-	-	28,430	2,481
November	-	-	-	-	-	-	-
December	-	-	-	-	-	-	-
January	-	-	-	-	-	-	-
February	-	-	-	-	-	-	-
March	-	-	-	-	-	-	-
April	-	-	-	-	-	-	-
May	-	-	-	-	-	-	-
June	-	-	-	-	-	-	-
Total	\$ 868,358	\$ 217,463	\$ 44,939	\$ 60,873	\$ 11,190	\$ 30,892	\$ 2,630
Total Capital Projected Cash Flow							\$ 1,236,346

Total Cash Flows

MONTH	MESA	GILBERT	SFM	CAJ	FT MCDOWELL	QUEEN CREEK	SWA	AMR	RIO VERDE
July	\$ 1,260,780	\$ 291,706	\$ 11,227	\$ 142,820	\$ 26,254	\$ 5,918	\$ 6,528	\$ 1,306	\$ 362
August	59,240	13,785	705	6,532	1,201	406	520	104	28
September	59,240	13,785	705	6,532	1,201	406	520	104	28
October	390,929	107,115	40,944	6,532	1,201	28,836	520	104	2,509
November	59,240	13,785	705	6,532	1,201	406	520	104	28
December	59,240	13,785	705	6,532	1,201	406	520	104	28
January	59,240	13,785	705	6,532	1,201	406	520	104	28
February	59,240	13,785	705	6,532	1,201	406	520	104	28
March	59,240	13,785	705	6,532	1,201	406	520	104	28
April	59,240	13,785	705	6,532	1,201	406	520	104	28
May	59,240	13,785	705	6,532	1,201	406	520	104	28
June	59,240	13,785	705	6,532	1,201	406	520	104	28
Total	\$ 2,244,110	\$ 536,674	\$ 59,222	\$ 214,669	\$ 39,461	\$ 38,814	\$ 12,251	\$ 2,450	\$ 3,155
Total O&M Project Cash Flow									\$ 3,150,807

Date: December 1, 2016
To: Dale Shaw
From: Randy Thompson
Subject: Motorola Lifecycle Services for FY17/18 and Beyond

For FY17/18 and beyond, I have requested an increase in the TRWC budget for additional services from Motorola Solutions (Motorola). Motorola refers to these services as “lifecycle services.” The purpose of this memo is to describe the changes to the services we receive from Motorola and explain why this increase in budget is beneficial to the TOPAZ Regional Wireless Cooperative (TRWC) members.

Current Motorola Services

- The City of Mesa, as the Administrative Manager for the TRWC, has a contract with Motorola called the System Upgrade Assurance or SUA II contract. This contract costs about \$600,000 per year. This contract provides the following services for the TRWC:
 - *System Upgrade Service.* Software updates for the TRWC infrastructure, and hardware updates for the two “core” (Master and Simulcast Prime) sites. The TRWC’s SUA II provides software updates every two years, which keeps the TRWC infrastructure within Motorola’s supported software window, and keeps our infrastructure current enough to support most of the latest system features. The TRWC’s SUA II also provides updates to the hardware in the core sites as technology evolves and new software features require new hardware capabilities. This avoids surprises and allows the TRWC to budget a known amount each year to keep the infrastructure current. Also included in the SUA II services is updated software for the equipment at the radio sites, and updated software for the dispatch consoles sites.
 - *Technical Support Service.* Technical Support for the TRWC infrastructure. This service enables the Communications Technicians who maintain the TRWC infrastructure to call Motorola for assistance when problems or questions arise. Motorola will engage experienced personnel and escalate to their engineering personnel for assistance in troubleshooting and service restoration, and providing answers to questions that are not able to be answered by the local Motorola personnel.
 - *Security Update Service.* The TRWC Motorola infrastructure includes Commercial Off-the-Shelf (COTS) software from various manufacturers, which makes the network vulnerable to security breaches or malicious software that exploits flaws in this software. This service provides updated virus definitions and other security tools and software enhancements and patches to mitigate these security vulnerabilities. Motorola tests this software before releasing it for installation in the network to ensure there are no unexpected conflicts or other problems as a result of loading these updates.
- The City of Apache Junction and the Town of Gilbert each have separate contracts with Motorola for on-site service for troubleshooting, restoral, and repair of their Motorola MCC 7500 dispatch consoles. These contracts cost each of these members approximately \$10,000

Motorola Lifecycle Services

per year. The Ft. McDowell Yavapai Nation would be entering into a similar contract in the first calendar quarter of 2017, as Ft. McDowell Yavapai Nation's MCC 7500 dispatch consoles will be out of warranty at that time. For the City of Mesa, this service is provided by the City's Communications Department, and is not part of the personnel costs and other costs charged to the members of the TRWC.

- The City of Mesa has a separate contract for technical support for the Motorola MCC 7500 dispatch consoles utilized by the Mesa Fire & Medical Department, Mesa Police Department, Mesa Utilities Control Center (primary and backup), and the Mesa Emergency Operations Center. This contract costs about \$2,200 per year, and is not part of the costs charged to the members of the TRWC.

Motorola Lifecycle Services

In addition to the services described the additional funds proposed in the TRWC FY2017/2018 budget will provide the following "lifecycle services":

- *Security Monitoring.* As mentioned above under *Security Update Service*, the TRWC infrastructure uses COTS software and hardware in many areas. This in itself makes the TRWC infrastructure vulnerable to viruses and other malicious software. Unfortunately, the role of Public Safety radio networks in supporting law enforcement and fire & medical services makes them targets for those who would seek to damage or disable a network for a variety of mischievous or criminal reasons. While infrastructure such as 911 telephone systems have recently been the subject of malicious attack, Public Safety radio networks have also been targeted, hacked, and attacked. To combat not only the inadvertent sources of security breaches (such as plugging an infected portable storage device into a computer) but the overtly mischievous or criminal acts to damage or disable the network, Motorola will constantly monitor the TRWC infrastructure for attempted intrusions or other activity that could indicate a security breach that could lead to a virus or other malicious software being introduced, or an attempt to damage or disable the network. Motorola's Security Network Operations Center will attempt to remotely respond to any attack, and dispatch personnel to take action if necessary. As the architects, designers, and manufacturer of much of the TRWC network infrastructure, Motorola is uniquely qualified to provide this service and provide services to monitor the security of the TRWC system.
- *Network Monitoring Service.* In addition to monitoring the TRWC infrastructure for security breaches, the *Network Monitoring Service* monitors the infrastructure for hardware, software, and network faults. This provides a backup to the services provided by the City of Mesa to detect problems with the TRWC infrastructure before they cause service-affecting impairments or outages.
- *Remote Security Update Service.* The *Security Update Service* described above require the City of Mesa Communications Department personnel to install the updates after they are received. Typically, these updates get installed once each calendar quarter, and it is a labor-intensive manual process to install these updates. The *Remote Security Update Service* provides an additional server on the TRWC network to manage and install these updates remotely in conjunction with the *Security Monitoring Service* and the *Network Monitoring Service* described above.
- *Dispatch Service.* When the *Security Monitoring Service* and/or *Network Monitoring Service* detect faults or failures, Motorola will notify the appropriate personnel (Motorola and/or City of Mesa) and ensure they are responding if necessary to the problem. The *Dispatch Service* will

Motorola Lifecycle Services

also escalate trouble calls with the appropriate personnel if the assigned personnel do not respond in a timely manner or the severity of the issue requires escalation for notification purposes.

- *On-site Service.* Motorola will provide personnel 7 days per week, 24 hours per day, to respond within 4 hours to trouble calls from the *Dispatch Service* or from the City of Mesa. Because Motorola will be responding with their trained technicians, this should reduce the responses by the City of Mesa's Communications Technicians to trouble calls involving the network transport or other City of Mesa responsibilities. Motorola provided this service during the warranty for the TRWC Lifecycle Upgrade, and it was effective in responding to problems and resolving them in a timely manner. The cost of this service is partially offset in the TRWC budget by a reduction in personnel services and the "Other Maintenance and Repair" line item.

On-site service will also cover the dispatch consoles at the following locations:

- City of Apache Junction Police Department (separate contract no longer required)
- Town of Gilbert Police Department (separate contract no longer required)
- Fort McDowell Yavapai Nation Police & Fire Dispatch (separate contract not required)
- City of Mesa (separate Technical Services contract no longer required):
 - Mesa Police Dispatch
 - Mesa Fire & Medical Regional Dispatch Center
 - Emergency Operations Center
 - Utilities Control Center
 - Backup Utilities Control Center
- *Network Preventive Maintenance Service.* One of the methods that has proven effective in minimizing or eliminating impairments or outages to networks such as the TRWC's is annual preventive maintenance of infrastructure equipment. Motorola will provide this annual service as part of the services being offered. The City of Mesa will complement this service by providing annual preventive maintenance on ancillary equipment such as antennas & transmission lines, direct current power plants & batteries, emergency generators, network connections by point-to-point microwave radio &/or fiber optic cable (including network routers & switches), and site environmental systems.

Fire Hazard Zone Communications System Services

Although the Fire Hazard Zone Communications System (hereinafter referred to as "VHF") has not gone into service yet, it is anticipated it will be in service by July 1, 2017. For this reason, costs for Motorola services for the VHF network are included for the following:

- *Adding the VHF Equipment to the System Upgrade Assurance II program.* As with the TRWC's APCO Project 25 (P25) 7/800 MHz network, adding the VHF system to the SUA II will ensure the network has the latest software and core hardware updates to keep the network operating efficiently.
- *Lifecycle Services for the VHF System.* Similar to the TRWC's APCO Project 25 (P25) 7/800 MHz network, Motorola will provide the following services for the VHF network:
 - *Technical Support*
 - *Dispatch*
 - *On-site Response*
 - *Network Preventative Maintenance*

Motorola Lifecycle Services

- *Infrastructure Repair / Advance Replacement.* This service will provide advance replacement of failed Field Replaceable Units (FRUs) from Motorola's depot in advance of returning the failed equipment to Motorola for repair. Motorola will also cover the cost of repair or replacement of FRUs under this agreement. Because the City of Mesa Communications Department does not have experience with the failure rates of the equipment for the VHF system and given the mission criticality of a Fire Hazard Zone Communications System, it seems prudent to include this service even though it is not provided for the TRWC's APCO Project 25 (P25) 7/800 MHz network.

Summary

The additional services proposed for the increase in the TRWC budget will provide the following benefits to the members of the TRWC:

- Improved network security through continuous monitoring and remote management of security updates. This is the single greatest change in the services we received from Motorola, as we do not have continuous security monitoring service in place.
- Improved network reliability by providing monitoring functions for malfunctions or other network problems, and dispatching trained and experienced Motorola personnel to respond to the trouble, and through annual preventative maintenance services on the Motorola equipment. This will replace some of the services currently provided by the City of Mesa, and the City of Mesa will continue to provide additional services not offered by Motorola for maintenance and operations of the entire network.
- Comprehensive coverage of the entire TRWC network (except for SUA II hardware services for radio sites and dispatch consoles). This will provide us with a single point of contact for these services, and will avoid members having to execute individual contracts for dispatch console services.



Capital Plan for FY17/18 to FY24/25

This plan describes and provides details of the projects forecast for the TOPAZ Regional Wireless Cooperative for the fiscal years of 2017/2018 through 2024/2025. Projects beyond fiscal year 2024/2025 are included for planning and visibility.

Projects Funded for the Current Fiscal Year

TOPAZ Voice Radio Network Upgrade **Project No. CN0022** **\$7,169,138**

Timeframe: Project Complete – ongoing lease payments only

This project provided a lifecycle upgrade to the TOPAZ 800 MHz voice radio network infrastructure and added the backup capability for the Master Site (Dynamic Site Resiliency, DSR) and the geo-redundant Prime Site for the simulcast cell. This project is complete, but appears on the TRWC Capital Plan because it was funded through a lease-purchase arrangement. The remaining lease payments (\$433,828 each) are due in July, 2017, July, 2018, and July, 2019.

Fire Hazard Zone Communications System (VHF) **Project No. CP0305** **\$1,181,168**

Timeframe: Forecast completion of acceptance testing July 1, 2017

This project will provide radio infrastructure to communicate with firefighters when working in areas deemed hazard or hot zones. The communications in the hazard or hot zones will be on the Very High Frequency (VHF) radio band (150-174 MHz). Firefighters and on-scene command personnel will communicate direct from radio-to-radio without any infrastructure. The infrastructure implemented by this project will enable the tele-communicators and command personnel in the fire alarm room (dispatch) to monitor the fire ground communications and communicate with on-scene personnel. This infrastructure will also receive and allow response to transmissions initiated when the “emergency” button on the handheld or vehicle-mounted radio is activated. This system will provide operational consistency with the fire departments dispatched by the Phoenix Fire Department. This project was funded through a lease-purchase agreement, with the final lease payment of \$496,164 due October, 2017. The forecast completion of the Fire Hazard Zone Communications System vendor acceptance testing is July 1, 2017.

Projects Partially Funded for the Current Fiscal Year

Wireless Backhaul (Microwave) Network Upgrade **Project No. CP0093** **\$306,350**

Timeframe: Design, Specification, & Bid complete mid-May, 2017; Equipment Delivery after July 1, 2017

The wireless backhaul or point-to-point microwave radio network connects the radio sites used by the TRWC into a network. The radio signals received from the radio sites are transported to a central location for processing and then transported back to each radio site for transmission to field units. The current equipment in this network is obsolete and on best-effort support by the manufacturer, and utilizes technology that is obsolete and inefficient in transporting the data to and from the radio sites. The new wireless backhaul equipment will transport the signals with technology that matches the other network components, improving efficiency.

This project was previously forecast to the TRWC membership for the FY18/19 to FY20/21 time period with a total project cost of \$3.763M for the entire project (not just the TRWC share). The prices for improved technology have fallen substantially since those estimates were developed, so the entire



Capital Plan for FY17/18 to FY24/25

project is now estimated at \$612.7K, of which the TRWC funds one-half. Although originally not funded for FY16/17, the City of Mesa has made funds for this project available in FY16/17. Since the other members of the TRWC did not prepare for this expenditure in FY16/17, this situation will be mitigated by receiving the equipment in July, 2017, so TRWC members can pay with FY17/18 funds.

Unfunded Lifecycle Upgrade Projects

Communications Building UPS Battery Lifecycle Replacement **Project No. CP0698** **\$32,000**

Timeframe: July 1, 2018 to June 30, 2019 and July 1, 2022 to June 30, 2023

The City of Mesa Communications Building includes an Uninterruptible Power Supply (UPS) that keeps critical equipment operational during a power failure while the building emergency generators are starting. This UPS relies on batteries to store the energy required to keep the critical electronic systems functioning without interruption. These batteries require replacement every four years, at a cost of about \$30,000, of which the TRWC pays one-half.

Radio Sites Emergency Power **Project No. CP0094** **\$585,000**

Timeframe: two sites annually, FY18/19 to FY24/25, depending on the availability of funds

Each TOPAZ radio site is equipped with an emergency generator to supply electrical power in the event of a commercial alternating current (AC) power failure. With the exception of a few sites, the generators are at least 15 years old, and several are much older. Because these generators sit outdoors in our desert environment, they need to be replaced periodically to ensure they start and run when there is loss of power. The plan is to replace the emergency generators at two radio sites each fiscal year, beginning in FY18/19, and finishing in FY24/25.

Florence Gardens TOPAZ ISR Site **Project No. CN0039** **\$300,000**

Timeframe: 1st calendar quarter of 2019, depending on the availability of funds

The Florence Gardens Intelligent Site Repeater (ISR) provides TOPAZ wide-area service to the area around Florence for the City of Mesa Gas Utility Magma Gas Service Area, and the Apache Junction Police Department for communications when transporting prisoners to the Pinal County Jail. The Florence Gardens ISR was put in service in October, 2016, with equipment that was removed from the Thompson Peak site that is over 15 years old. This equipment is obsolete, and will require upgrading to maintain compatibility with the TOPAZ network infrastructure software. This project is planned for FY18/19 to ensure compatibility with the TOPAZ network infrastructure software upgrade planned for the middle of calendar year 2019.

TOPAZ Antenna & Transmission Lines **Project No. CP0699** **\$400,000**

Timeframe: July 1, 2018 to June 30, 2020, depending on the availability of funds

The antennas and associated transmission lines that carry radio signals between the TOPAZ radio infrastructure and the antennas at each site are over 15 years old and need to be replaced due to their age. This will ensure the TOPAZ network will continue to provide reliable radio coverage for the users of the TRWC. This project is planned for FY18/19 and FY19/20 to spread the cost over two fiscal years.

Internet Protocol Network Routers & Switches **Project No. CN0050** **\$415,000**

Timeframe: July 1, 2019 to June 30, 2021, depending on the availability of funds

Internet Protocol (IP) network routers and switches direct the communications between the radio sites and the TOPAZ infrastructure. They also redirect those communications if there is a failure in the



Capital Plan for FY17/18 to FY24/25

network that connects the TOPAZ radio sites and infrastructure together. This equipment is seven years old at this time, and is on best-effort support status with the manufacturer. To ensure continued reliable operation of this network, this equipment requires upgrading. The TRWC pays one-half of the \$830,000 total cost of this upgrade.

Radio & Core Sites Battery Backup Next Lifecycle Upgrade **Project No. NEW** **\$240,000**

Timeframe: July 1, 2024 to June 30, 2028, depending on the availability of funds

The batteries that back up the TOPAZ voice radio network and other equipment at the radio sites, the core site at City of Mesa Communications Building, and the TOPAZ backup core site at Mesa Fire Station 219 are just completing their upgrade cycle, but it is prudent to plan for the next upgrade. These batteries have a service life of ten years. Normally, these batteries only power the equipment at a site for less than a minute while the emergency generator starts and picks up the load to power the site equipment. However, we size these batteries to power the site for a minimum of 4 hours in the event the emergency generator does not start, so there is time to take a portable generator to the site to provide emergency power.

Radio & Core Sites DC Power Plant Lifecycle Upgrade **Project No. NEW** **\$320,000**

Timeframe: July 1, 2026 to June 30, 2027, depending on the availability of funds

The equipment at the radio sites is powered by a Direct Current (DC) power plant that allows backup of the site equipment with battery banks as described above. This arrangement also isolates the equipment from disturbances on the incoming Alternating Current (AC) power lines, which keeps the equipment operating during reductions or disruptions (outages) in the AC power supply. This equipment has a typical service life of 15 years. The equipment was last replaced in August, 2011.

Fire Hazard Zone (VHF) Lifecycle Upgrade **Project No. NEW** **\$2,500,000**

Timeframe: July 1, 2031 to June 20, 2032, depending on the availability of funds

The Fire Hazard Zone (VHF) Communications System provides radio infrastructure to communicate with firefighters when working in areas deemed hazard or hot zones. The communications in the hazard or hot zones will be on the Very High Frequency (VHF) radio band (150-174 MHz). Firefighters and on-scene command personnel will communicate direct from radio-to-radio without any infrastructure. The infrastructure implemented by this project will enable the tele-communicators and command personnel in the fire alarm room (dispatch) to monitor the fire ground communications and communicate with on-scene personnel. This infrastructure will also receive and allow response to transmissions initiated when the "emergency" button on the handheld or vehicle-mounted radio is activated. This system provides operational consistency with the fire departments dispatched by the Phoenix Fire Department. While this equipment is not planned to be in service until the middle of calendar year 2017, it is prudent to plan for the upgrade of the equipment in the future. The typical service life for this equipment is fifteen years.

TOPAZ Voice Radio Network Next Lifecycle Upgrade **Project No. NEW** **\$7,500,000**

Timeframe: July 1, 2030 to June 30, 2031, depending on the availability of funds

The TOPAZ voice radio network infrastructure was upgraded in August-September, 2015, with new equipment at the nine simulcast cell radio sites, and the addition of the backup Master Site (DSR) and geo-redundant Prime Site. The typical service life for this equipment is 15 years, so it is prudent to plan for the next lifecycle upgrade.



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Unfunded Capital Improvement Projects

System-of-Systems Networking **Project No. CP0438** **\$500,000**

Timeframe: July 1, 2018 to June 30, 2019, depending on the availability of funds

System-of-systems networking is a method for radio networks such as the TRWC to connect with other similar radio networks to allow handheld and vehicle-mounted radios to “roam” from system to system and utilize the resources in the other system to communicate with users in both the home and visited systems. Possible applications of this type of networking would be for the TRWC to network with the (Phoenix) Regional Wireless Cooperative or Maricopa or Pinal Counties, for example. This would allow TRWC users to roam into those systems and talk back to units in the TRWC service area and the other system’s service area, and units from the other system to roam into the TRWC service area to utilize resources on the TRWC network to talk back to their system as well as users in radio coverage of the TRWC network. Not all system talkgroups (channels) would have this capability. The current technology for system-of-systems networking (Motorola Solutions Inter Sub-Site Interface (ISSI) 8000) allows users to move from one system to the other automatically, without user action.

Interface for Non-Motorola Dispatch Consoles **Project No. NEW** **\$250,000**

Timeframe: July 1, 2019 to June 30, 2020, depending on the availability of funds

The TRWC network currently supports only Motorola Solutions Inc (“Motorola”) dispatch consoles. This limits the selection of dispatch consoles available for use by the TRWC dispatch centers (Apache Junction Police, Gilbert Police, Mesa Emergency Operations Center, Mesa Fire & Medical Regional, Mesa Police, and Mesa Utilities Control Center & backup site). In order to provide flexibility for the TRWC member dispatch centers in the selection of non-Motorola dispatch consoles, a Console Sub-System Interface (CSSI) is required. Note: the \$250,000 cost includes a limited number of licenses for connection of non-Motorola dispatch consoles to the TRWC P25 800 MHz radio network. Non-Motorola dispatch consoles beyond this number of licenses will incur a per dispatch console license fee.

Internet Protocol Routers & Switches Expansion **Project No. CP0755** **\$420,000**

Timeframe: July 1, 2018 to June 30, 2019, depending on the availability of funds

Internet Protocol (IP) network routers and switches direct the communications between the TOPAZ radio sites and the TOPAZ infrastructure. They also redirect those communications if there is a failure in the network that connects the TOPAZ radio sites and infrastructure together. When the TOPAZ Lifecycle Upgrade was implemented, there were some sites that did not have routers to direct/redirect the radio traffic. In those cases, other network components were reconfigured to provide some of the direction/ redirection of the radio traffic, but this is not the best way to implement these capabilities, and it has resulted in some unexpected network behavior and unscheduled impairments to the TOPAZ network. To mitigate these unscheduled impairments to the TOPAZ network, the proper equipment will be installed at all TOPAZ sites to provide full network direction/ redirection capabilities for the TOPAZ radio sites.

Southeast Queen Creek TOPAZ Expansion Site* **Project No. CP0091** **\$800,000**

Timeframe: July 1, 2019 to June 30, 2021, depending on the availability of funds

As population growth in the far southeast valley continues, demand for Public Safety services will grow as well. This will require an additional TOPAZ radio site in the southeast area of Queen Creek to ensure reliable in-building TOPAZ radio coverage (both 800 MHz and VHF). This will require the development of



Capital Plan for FY17/18 to FY24/25

a radio site, including a radio tower, equipment shelter, emergency generator, radio and network equipment, and services, but excluding land. Note: we will look at colocation at an existing radio site or on an existing radio tower, or sharing existing facilities or systems if possible to avoid duplication (“overbuilding”) and constructing facilities if they are not necessary.

Southeast Apache Junction TOPAZ Expansion Site* **Project No. CP0754** **\$850,000**

Timeframe: July 1, 2020 to June 30, 2022, depending on the availability of funds

As population growth in the far east valley continues, demand for Public Safety services will grow as well. This will require an additional TOPAZ radio site in the southeast area of Apache Junction (southeast of Fire Station 264) to ensure reliable in-building TOPAZ radio coverage (both 800 MHz and VHF). This will require the development of a radio site, including a radio tower, equipment shelter, emergency generator, radio and network equipment, and services, but excluding land. Note: we will look at colocation at an existing radio site or on an existing radio tower, or sharing existing facilities or systems if possible to avoid duplication (“overbuilding”) and constructing facilities if they are not necessary.

Northeast Mesa TOPAZ Expansion Site* **Project No. CP0779** **\$900,000**

Timeframe: July 1, 2020 to June 30, 2022, depending on the availability of funds

As population growth in the east valley continues, demand for Public Safety services will grow as well. This will require an additional TOPAZ radio site in the far northeast area of Mesa to ensure reliable in-building TOPAZ radio coverage (both 800 MHz and VHF). This will require the development of a radio site, including a radio tower, equipment shelter, emergency generator, radio and network equipment, and services, but excluding land. Note: we will look at colocation at an existing radio site or on an existing radio tower, or sharing existing facilities or systems if possible to avoid duplication (“overbuilding”) and constructing facilities if they are not necessary.

*Note the three projects listed above were previously shown on the TRWC Capital Plan as “TOPAZ Voice Radio Network Coverage Improvements” with a total forecast cost of \$3,081,318. The total forecast cost for the three projects listed above is \$2,550,000, a reduction of \$531,318 from the previous forecast.

Automated Billing & Upgrade Network Management Tools **Project No. NEW** **\$500,000**

Timeframe: July 1, 2020 to June 30, 2022, depending on the availability of funds

This project will purchase and implement automated airtime billing & accounting hardware and software and upgrade the network management tools for the TOPAZ network. At the present time, the airtime billing data is obtained by a labor-intensive process that does not provide airtime data for each individual radio utilizing TOPAZ airtime. Automating this process will reduce costs to the TRWC members, and allow for more granular airtime data if desired. This upgrade will also include the network management tools that are utilized in monitoring and analyzing day-to-day operations of the network and in troubleshooting network impairments and outages.

TOPAZ Regional Wireless Cooperative Roadmap

		16/17	17/18	18/19	19/20	20/21	21/22	22/23	23/24		
System Software		<div style="border: 1px solid black; border-radius: 10px; padding: 2px; width: fit-content; margin: 5px auto;">V 7.17 Available Q2</div> <div style="border: 1px solid black; border-radius: 10px; padding: 2px; width: fit-content; margin: 5px auto;">Upgrade to V 7.16 6/5/2017</div>	<div style="border: 1px solid black; border-radius: 10px; padding: 2px; width: fit-content; margin: 5px auto;">V 7.18 Available Q2</div>	<div style="border: 1px solid black; border-radius: 10px; padding: 2px; width: fit-content; margin: 5px auto;">V 7.19 Available Q2</div> <div style="border: 1px solid black; border-radius: 10px; padding: 2px; width: fit-content; margin: 5px auto;">Upgrade to V 7.18 Q4</div>	<div style="border: 1px solid black; border-radius: 10px; padding: 2px; width: fit-content; margin: 5px auto;">V 7.20 Available Q2</div> <div style="border: 1px solid black; border-radius: 10px; padding: 2px; width: fit-content; margin: 5px auto;">Upgrade to V 7.20 Q4</div>	<div style="border: 1px solid black; border-radius: 10px; padding: 2px; width: fit-content; margin: 5px auto;">V 7.21 Available Q2</div> <div style="border: 1px solid black; border-radius: 10px; padding: 2px; width: fit-content; margin: 5px auto;">Upgrade to V 7.20 Q4</div>	<div style="border: 1px solid black; border-radius: 10px; padding: 2px; width: fit-content; margin: 5px auto;">V 7.22 Available Q2</div>	<div style="border: 1px solid black; border-radius: 10px; padding: 2px; width: fit-content; margin: 5px auto;">V 7.23 Available Q2</div> <div style="border: 1px solid black; border-radius: 10px; padding: 2px; width: fit-content; margin: 5px auto;">Upgrade to V 7.22 Q4</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 5px auto;">Motorola SUA II Expires 6/30/2023</div>	<div style="border: 1px solid black; border-radius: 10px; padding: 2px; width: fit-content; margin: 5px auto;">V 7.24 Available Q2</div>	<p>Legend</p> <div style="border: 1px solid black; border-radius: 10px; padding: 2px; width: fit-content; margin-bottom: 5px;">Lifecycle Maintenance</div> <div style="border: 1px solid black; border-radius: 10px; padding: 2px; width: fit-content; margin-bottom: 5px;">Other Initiatives</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 5px;">Bond Items</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 5px;">BAR or other Items</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 5px;">Ancillary Projects & Initiatives</div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 5px;">Version Availability</div>	
7/800 MHz Infrastructure		<div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">TOPAZ Voice Radio Network Lifecycle Upgrade Payment Only: \$434K 100% TRWC</div>	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">TOPAZ Voice Radio Network Lifecycle Upgrade Payment Only: \$434K 100% TRWC</div>	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">TOPAZ Voice Radio Network Lifecycle Upgrade Payment Only: \$434K 100% TRWC</div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">Florence Gardens ISR Site Lifecycle Upgrade, \$300K 100% TRWC</div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">TOPAZ Antenna & Transmission Line Lifecycle, \$200K 100% TRWC</div>	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">TOPAZ Voice Radio Network Lifecycle Upgrade Payment Only: \$434K 100% TRWC</div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">TOPAZ Antenna & Transmission Line Lifecycle, \$200K 100% TRWC</div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">Southeast Queen Creek TOPAZ Expansion Site \$400K, 100% TRWC</div>	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">Southeast Apache Junction TOPAZ Expansion Site \$425K, 100% TRWC</div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">Southeast Queen Creek TOPAZ Expansion Site \$400K, 100% TRWC</div>	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">Southeast Apache Junction TOPAZ Expansion Site \$425K, 100% TRWC</div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">Northeast Mesa TOPAZ Expansion Site \$450K, 100% TRWC</div>	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">Northeast Mesa TOPAZ Expansion Site \$450K, 100% TRWC</div>			
Network Backbone (Microwave)		<div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">Point-to-point Microwave Radio Upgrade Design & RFB</div>	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">Point-to-point Microwave Radio Upgrade Procurement & Installation \$613K, 50% CoM, 50% TRWC</div>	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">Internet Protocol Network Routers & Switches Expansion \$420K, 100% TRWC</div>	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">Internet Protocol Network Routers & Switches Lifecycle Upgrade \$415K, 50% CoM, 50% TRWC</div>	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">Internet Protocol Network Routers & Switches Lifecycle Upgrade \$415K, 50% CoM, 50% TRWC</div>			<p>--- Dependency ---</p> <p>— Sequence —</p> <p>..... Deferred</p>		
Other TRWC Related				<div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">Communications Building UPS Battery Lifecycle Upgrade \$30,000, 50% CoM, 50% TRWC</div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">Radio Sites Emergency Power (Generator) Lifecycle Upgrade \$90,000, 100% TRWC</div>	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">Radio Sites Emergency Power (Generator) Lifecycle Upgrade \$90,000, 100% TRWC</div>	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">Radio Sites Emergency Power (Generator) Lifecycle Upgrade \$90,000, 100% TRWC</div>	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">Radio Sites Emergency Power (Generator) Lifecycle Upgrade \$90,000, 100% TRWC</div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">Communications Building UPS Battery Lifecycle Upgrade \$34,000, 50% CoM, 50% TRWC</div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">Radio Sites Emergency Power (Generator) Lifecycle Upgrade \$90,000, 100% TRWC</div>	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">Radio Sites Emergency Power (Generator) Lifecycle Upgrade \$90,000, 100% TRWC</div>			
Fire Hazard Zone		<div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">Fire Hazard Zone Communication System \$685K, 100% TRWC Special Assessment</div>	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">Fire Hazard Zone Communication System \$496K, 100% TRWC Special Assessment</div>								
Consoles											
Subscribers											
Other Initiatives				<div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">System-of-Systems Networking (ISSI 8000) \$500K 100% TRWC</div>	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">Interface for Non-Motorola Dispatch Consoles (CSSI) \$250K 100% TRWC</div>	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">Automated Billing & Upgraded Network Management Tools \$250K, 100% TRWC</div>	<div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 5px auto;">Automated Billing & Upgraded Network Management Tools \$250K, 100% TRWC</div>				
Totals		<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;">Totals: TRWC: \$1.119M</div>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;">Totals: TRWC: \$1.236M COM: \$306K</div>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;">Totals: TRWC: \$1.959M COM: \$15K</div>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;">Totals: TRWC: \$1.581M COM: \$208K</div>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;">Totals: TRWC: \$1.373M COM: \$208K</div>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;">Totals: TRWC: \$1.215M</div>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;">Totals: TRWC: \$557K</div>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 5px auto;">Totals: TRWC: \$90K</div>		

Color Legend

- Regulatory Compliance
- Voice/Data Convergence
- Reliability
- Capacity/Coverage
- Other

TRWC Capital Plan for FY2017/2018 to FY2024/2025

Project Name	Project Number	Approved Budget FY16/17 3/3/2016	FY17/18		FY18/19		FY19/20		FY20/21		FY21/22		FY22/23		FY23/24		FY24/25		Total		
			3/3/16 Forecast	Revised Forecast	3/3/16 Forecast																
<u>Funded for Current Fiscal Year</u>																					
Fire Hazard Zone Communications System (VHF)	CP0305	\$685,000	\$496,168	\$496,168																\$1,181,168	\$1,181,168
TOPAZ Voice Radio Network Lifecycle Upgrade	CN0022	\$433,828	\$433,828	\$433,828	\$433,828	\$433,828	\$433,828	\$433,828	\$433,828											\$1,735,312	\$1,735,312
<u>Partially Funded for Current Fiscal Year</u>																					
Wireless Backhaul (Microwave) Network Lifecycle Upgrade	CP0093		\$0	\$306,350	\$1,209,798	\$0	\$1,253,003	\$0	\$1,299,793	\$0										\$3,762,594	\$306,350
<u>Unfunded Lifecycle Upgrades</u>																					
Communications Building UPS Battery Lifecycle Upgrade	CP0698						\$15,000							\$17,000						\$0	\$32,000
Radio Sites Emergency Power Lifecycle Upgrade	CP0094						\$90,000	\$198,298	\$90,000	\$198,298	\$90,000	\$198,298	\$90,000	\$90,000		\$90,000		\$45,000	\$594,894	\$585,000	
Florence Gardens TOPAZ ISR Site Lifecycle Upgrade	CN0039				\$0	\$300,000														\$0	\$300,000
TOPAZ Antenna & Transmission Lines Lifecycle Upgrade	CP0699				\$0	\$200,000		\$200,000												\$0	\$400,000
Internet Protocol Network Routers & Switches Lifecycle Upgrade	CN0050						\$0	\$207,500	\$0	\$207,500										\$0	\$415,000
Radio & Core Sites Battery Backup Lifecycle Upgrade (beyond FY24/25)	NEW																	\$38,000	\$0	\$0	\$38,000
Radio & Core Sites DC Power Plant Lifecycle Upgrade (beyond FY24/25)	NEW																			\$0	\$0
Fire Hazard Zone Communications System (VHF) Lifecycle Upgrade (beyond FY24/25)	NEW																			\$0	\$0
TOPAZ Voice Radio Network Next Lifecycle Upgrade	NEW																			\$0	\$0
<u>Unfunded Capital Improvements</u>																					
Regional Communications Authority System-of-Systems Networking (ISSI 8000)	CP0438				\$750,000	\$500,000														\$750,000	\$500,000
Interface for Non-Motorola Dispatch Consoles (CSSI)	NEW							\$250,000												\$0	\$250,000
Internet Protocol Network Routers & Switches Expansion	CP0755					\$420,000														\$0	\$420,000
TOPAZ Voice Radio Network Coverage Improvements																					
Southeast Queen Creek TOPAZ Expansion Site	CP0091						\$724,946	\$400,000	\$750,687	\$400,000	\$674,360	\$0	\$931,325	\$0						\$3,081,318	\$800,000
Southeast Apache Junction TOPAZ Expansion Site	CP0754									\$425,000		\$425,000								\$0	\$850,000
Northeast Mesa TOPAZ Expansion Site	CP0779											\$450,000	\$450,000							\$0	\$900,000
Automated Billing & Upgraded Network Managemnt Tools	NEW									\$250,000		\$250,000								\$0	\$500,000
																				\$0	\$0
TOTAL		\$1,118,828	\$929,996	\$1,236,346	\$2,393,626	\$1,958,828	\$2,610,075	\$1,581,328	\$2,248,778	\$1,372,500	\$872,658	\$1,215,000	\$931,325	\$557,000	\$0	\$90,000	\$0	\$83,000	\$11,105,286	\$9,212,830	
Normal Assessment	% Split																				
City of Mesa	72.96%	\$316,525	\$316,525	\$540,041	\$1,746,413	\$1,429,180	\$1,904,336	\$1,153,752	\$1,640,730	\$1,001,389	\$636,700	\$886,476	\$679,504	\$406,393	\$65,665	\$60,558	\$7,240,734	\$5,859,979			
Town of Gilbert	17.02%	\$73,828	\$73,828	\$125,962	\$407,344	\$333,351	\$444,179	\$269,108	\$382,694	\$233,570	\$148,508	\$206,767	\$158,492	\$94,790	\$15,316	\$14,125	\$1,688,873	\$1,366,818			
Superstition Fire & Medical District	0.42%	\$1,837	\$1,837	\$3,134	\$10,135	\$8,294	\$11,052	\$6,696	\$9,522	\$5,812	\$3,695	\$5,145	\$3,944	\$2,359	\$381	\$351	\$42,022	\$34,008			
City of Apache Junction	7.22%	\$31,316	\$31,316	\$53,429	\$172,783	\$141,397	\$188,407	\$114,147	\$162,327	\$99,073	\$62,992	\$87,704	\$67,227	\$40,207	\$6,497	\$5,991	\$716,367	\$579,761			
Ft. McDowell Yavapai Indian Community	2.06%	\$8,922	\$8,922	\$15,223	\$49,229	\$40,286	\$53,680	\$32,522	\$46,249	\$28,228	\$17,948	\$24,988	\$19,154	\$11,456	\$1,851	\$1,707	\$204,104	\$165,183			
Town of Queen Creek	0.30%	\$1,312	\$1,312	\$2,239	\$7,240	\$5,924	\$7,894	\$4,783	\$6,801	\$4,151	\$2,639	\$3,675	\$2,817	\$1,685	\$272	\$251	\$30,015	\$24,292			
Rio Verde Fire District	0.02%	\$87	\$87	\$149	\$483	\$395	\$526	\$319	\$453	\$277	\$176	\$245	\$188	\$112	\$18	\$17	\$2,001	\$1,620			
Total Normal Assessment		\$433,828	\$433,828	\$740,177	\$2,393,626	\$1,958,828	\$2,610,075	\$1,581,328	\$2,248,778	\$1,372,500	\$872,658	\$1,215,000	\$931,325	\$557,000	\$0	\$90,000	\$0	\$83,000	\$9,924,118	\$8,031,661	
Special Assessment for Fire Hazard Zone Communications	% Split																				
City of Mesa	66.85%	\$457,923	\$331,688	\$331,688	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$789,611	\$789,611
Town of Gilbert	18.81%	\$128,849	\$93,329	\$93,329	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$222,178	\$222,178
Superstition Fire & Medical District	8.11%	\$55,554	\$40,239	\$40,239	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$95,793	\$95,793
Town of Queen Creek	5.73%	\$39,251	\$28,430	\$28,430	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$67,681	\$67,681
Rio Verde Fire District	0.50%	\$3,425	\$2,481	\$2,481	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$5,906	\$5,906
Total Fire Hazard Zone Communications Assessment		\$685,000	\$496,168	\$496,168	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,181,168	\$1,181,168
Total Assessment																					
City of Mesa		\$774,448	\$648,213	\$871,729	\$1,746,413	\$1,429,180	\$1,904,336	\$1,153,752	\$1,640,730	\$1,001,389	\$636,700	\$886,476	\$679,504	\$406,393	\$65,665	\$60,558	\$8,030,345	\$6,649,590			
Town of Gilbert		\$202,677	\$167,157	\$219,292	\$407,344	\$333,351	\$444,179	\$269,108	\$382,694	\$233,570	\$148,508	\$206,767	\$158,492	\$94,790	\$15,316	\$14,125	\$1,911,051	\$1,588,995			
Superstition Fire & Medical District		\$57,390	\$42,076	\$43,373	\$10,135	\$8,294	\$11,052	\$6,696	\$9,522	\$5,812	\$3,695	\$5,145	\$3,944	\$2,359	\$381	\$351	\$137,814	\$129,801			
City of Apache Junction		\$31,316	\$31,316	\$53,429	\$172,783	\$141,397	\$188,407	\$114,147	\$162,327	\$99,073	\$62,992	\$87,704	\$67,227	\$40,207	\$6,497	\$5,991	\$716,367	\$579,761			
Ft. McDowell Yavapai Indian Community		\$8,922	\$8,922	\$15,223	\$49,229	\$40,286	\$53,680	\$32,522	\$46,249	\$28,228	\$17,948	\$24,988	\$19,154	\$11,456	\$1,851	\$1,707	\$204,104	\$165,183			
Town of Queen Creek		\$40,563	\$29,743	\$30,669	\$7,240	\$5,924	\$7,894	\$4,783	\$6,801	\$4,151	\$2,639	\$3,675	\$2,817	\$1,685	\$272	\$251	\$97,696	\$91,973			
Rio Verde Fire District		\$3,512	\$2,568	\$2,630	\$483	\$395	\$526	\$319	\$453	\$277	\$176	\$245	\$188	\$112	\$18	\$17	\$7,907	\$7,525			
Total Assessment		\$1,118,828	\$929,996	\$1,236,345	\$2,393,626	\$1,958,828	\$2,610,075	\$1,581,328	\$2,248,778	\$1,372,500	\$872,658	\$1,215,000	\$931,325	\$557,000	\$0	\$90,000	\$0	\$83,000	\$11,105,286	\$9,212,829	



FY2017/18
Proposed Budget

As Endorsed by the TRWC Executive Committee

FY2017/18 Endorsed Budget

	FY 16/17 APPROVED	FY 17/18 PROPOSED	Increase (Decrease)	
1. LABOR	\$ 492,000	\$ 486,600	\$ (5,400)	-1.1%
2. NON LABOR	1,138,125	1,427,861	289,736	25.5%
4. TOTAL OPERATING & MAINTENANCE BUDGET	<u>\$ 1,630,125</u>	<u>\$ 1,914,461</u>	<u>\$ 284,336</u>	<u>17.4%</u>
5. MONTHLY AIRTIME HOURS	1,019	965		
6. RECONCILIATION OF BUDGET CHANGES:				
a. Salaries - 5% estimated increase offset by Motorola Services			\$ (5,400)	
b. New Vinco Contract - tower service and repair			15,000	
c. New Proxim Contract - equipment no longer under warranty			7,280	
d. New Motorola Contract-Security Monitoring and Onsite Support			330,000	
e. Reduction in Motorola contract for current services			(57,000)	
f. Materials & Supplies/NonCap Assets			(27,600)	
g. Professional Services -Grants			(8,100)	
h. VHF Service Contract with Motorola (allocated among Fire partners)			29,700	
i. Other changes			456	
TOTAL VARIANCE:			<u>\$ 284,336</u>	

FY2017/18 Endorsed Budget		FY 16/17 APPROVED	FY 17/18 ENDORSED	Variance Increase
Labor	Salaries and Wages	\$ 492,000	\$ 486,600	
	Total Labor	<u>\$ 492,000</u>	<u>\$ 486,600</u>	
ESCALATION FACTOR				
GENERAL & ADMINISTRATIVE - OTHER SERVICES				
	Temp Services	\$ 90,000	\$ 6,000	
	Prof Services - Consulting	-	87,210	
	Prof Services - Legal	37,000	37,000	
	Prof Services - Other	23,100	15,000	
	Ins. Premiums - Agencies	10,600	10,600	
	Utilities	72,500	72,500	
	Telephone	5,700	5,700	
	Repairs & Maint	10,400	10,400	
	Equipment Usage (Vehicles)	20,000	22,000	
	Shaw Butte & Florence Gardens	24,600	22,800	
	All Other Services	2,000	2,000	
	TOTAL OTHER SERVICES	<u>\$ 295,900</u>	<u>\$ 291,210</u>	
GENERAL & ADMINISTRATIVE - COMMODITIES				
	Non Cap Assets	\$ 60,000	\$ 50,000	
	Contract - Preventative Motorola	645,000	594,200	
	Contract - Security Monitoring Motorola	-	330,000	
	Software Maint-Mainsaver,Juniper	21,000	22,000	
	Materials & Repair Parts	37,600	20,000	
	All Other Commodities	1,000	1,000	
	TOTAL COMMODITIES	<u>\$ 764,600</u>	<u>\$ 1,017,200</u>	
OTHER BUDGET ITEMS				
	PROPOSED CONTINGENCY - 5%	\$ 77,625	\$ 89,751	
	VHF OPERATIONS (special assessment)	-	29,700	
	TOTAL OTHER BUDGET ITEMS	<u>\$ 77,625</u>	<u>\$ 119,451</u>	
	Total Operating & Maintenance	<u>\$ 1,630,125</u>	<u>\$ 1,914,461</u>	\$ 284,336

FY2017/18 Endorsed Budget			
O&M - AIRTIME PERCENTAGE (1)		VHF SPECIAL ASSESSMENT (2)	
Mesa	71.94%	Mesa Fire & Medical	66.85%
Gilbert	16.64%	Gilbert Fire	18.81%
Superstition Fire & Medical	0.63%	Superstition Fire & Medical	8.11%
Apache Junction	8.16%	Queen Creek Fire	5.73%
Ft McDowell	1.50%	Rio Verde Fire	0.50%
Queen Creek	0.33%	TOTAL	<u>100.00%</u>
Southwest Ambulance	0.65%		
American Medical Response	0.13%		
Rio Verde	0.02%		
TOTAL	<u>100.00%</u>		
<p>(1) Normal partner assessments are allocated based on recent rolling 6 month airtime averages and are subject to change based on actual monthly data. (9/30/16)</p> <p>(2) Agency cost distribution for the Hazard Zone Communication VHF Special Assessment is based on 12 months average Airtime as of March 31, 2015.</p>			

FY2017/18 Endorsed Budget

ANNUAL ESTIMATED REVENUE: OPERATING & MAINTENANCE

Mesa	\$	1,375,752	71.86%
Gilbert		319,211	16.67%
Superstition Fire & Medical		14,283	0.75%
Apache Junction		153,796	8.03%
Ft McDowell		28,271	1.48%
Queen Creek		7,922	0.41%
Southwest Ambulance		12,251	0.64%
American Medical Response		2,450	0.13%
Rio Verde		525	0.03%
TOTAL	\$	1,914,461	100.00%

FY2017/18 Endorsed Budget

	FY 16/17		FY 2017/18	FY 18/19	FY 19/20	FY 20/21
A. Fire VHF (CP0305)	\$ 685,000		\$ 496,168	\$ -	\$ -	\$ -
B. TOPAZ Voice Radio Network Upgrade (CP0090)	433,828		433,828	433,828	433,828	
C. Wireless Backhaul (Microwave) Network Upgrade (CP0093)			306,350			
D. Radio Sites Emergency Power Upgrade (CP0094)				90,000	90,000	90,000
E. Florence Gardens ISR Site Lifecycle upgrade				300,000		
F. Antenna & Transmission Lines Lifecycle Upgrade				200,000	200,000	
G. Internet Protocol Network Routers & Switches Lifecycle					207,500	207,500
H. System-of-Systems Networking				500,000		
I. Internet Protocol Network Routers & Switches Expansion				420,000		
J. Southeast Queen Creek Expansion Site					400,000	400,000
K. Southeast Apache Junction Expansion Site						425,000
L. Northeast Mesa Expansion Site						-
TOTAL to Partners	\$ 1,118,828		\$ 1,236,346	\$ 1,943,828	\$ 1,331,328	\$ 1,122,500
NORMAL ASSESSMENT TO PARTNERS(1)						
Mesa	\$ 316,525	72.51%	\$ 536,670	\$ 1,409,383	\$ 965,287	\$ 813,875
Gilbert	73,828	16.77%	124,134	325,996	223,275	188,252
Superstition Fire & Medical	1,837	0.63%	4,700	12,342	8,453	7,127
Apache Junction	31,316	8.22%	60,873	159,863	109,490	92,316
Ft McDowell	8,922	1.51%	11,190	29,387	20,127	16,970
Queen Creek	1,312	0.33%	2,462	6,465	4,428	3,733
Rio Verde	87	0.02%	149	392	268	226
TOTAL	\$ 433,828	100.00%	\$ 740,178	\$ 1,943,828	\$ 1,331,328	\$ 1,122,500
SPECIAL ASSESSMENT TO PARTNERS (VHF)(2)						
Mesa Fire & Medical	\$ 457,923	66.85%	\$ 331,688	\$ -	\$ -	\$ -
Gilbert Fire	128,849	18.81%	93,329	-	-	-
Superstition Fire & Medical	55,554	8.11%	40,239	-	-	-
Queen Creek Fire	39,251	5.73%	28,430	-	-	-
Rio Verde Fire	3,425	0.50%	2,481	-	-	-
TOTAL	\$ 685,000	100.00%	\$ 496,168	\$ -	\$ -	\$ -

(1) Normal partner assessments are allocated based on recent rolling 6 month airtime averages and are subject to change based on actual monthly data.
 (2) Agency cost distribution for the Hazard Zone Communication VHF Special Assessment is based on 12 months average Airtime as of March 31, 2015.

FY2017/18 Endorsed Budget

	FY 16/17		FY 2017/18		FY 18/19	FY 19/20	FY 20/21
CAPITAL IMPROVEMENT COSTS							
TOTAL ASSESSMENT TO PARTNERS							
Mesa	\$ 774,448	70.24%	\$ 868,358	\$ 1,409,383	\$ 965,287	\$ 813,875	
Gilbert	202,677	17.59%	217,463	325,996	223,275	188,252	
Superstition Fire & Medical	57,390	3.63%	44,939	12,342	8,453	7,127	
Apache Junction	31,316	4.92%	60,873	159,863	109,490	92,316	
Ft McDowell	8,922	0.91%	11,190	29,387	20,127	16,970	
Queen Creek	40,563	2.50%	30,892	6,465	4,428	3,733	
Rio Verde	3,512	0.21%	2,630	392	268	226	
TOTAL	\$ 1,118,828	100.00%	\$ 1,236,346	\$ 1,943,828	\$ 1,331,328	\$ 1,122,500	

- (1) Normal partner assessments are allocated based on recent rolling 6 month airtime averages and are subject to change based on actual monthly data.
- (2) Agency cost distribution for the Hazard Zone Communication VHF Special Assessment is based on 12 months average Airtime as of March 31, 2015.

FY2017/18 Endorsed Budget

O&M CASH FLOWS										
MONTH	MESA	GILBERT	SFM	CAJ	FT MCDOWELL	QUEEN CREEK	SWA	AMR	RIO VERDE	201
July	\$ 724,318	\$ 167,538	\$ 6,343	\$ 82,158	\$ 15,103	\$ 3,323	\$ 6,544	\$ 1,309	\$ 201	\$ 201
August	59,449	13,751	521	6,743	1,240	273	537	107	17	17
September	59,449	13,751	521	6,743	1,240	273	537	107	17	17
October	59,449	13,751	521	6,743	1,240	273	537	107	17	17
November	59,449	13,751	521	6,743	1,240	273	537	107	17	17
December	59,449	13,751	521	6,743	1,240	273	537	107	17	17
January	59,449	13,751	521	6,743	1,240	273	537	107	17	17
February	59,449	13,751	521	6,743	1,240	273	537	107	17	17
March	59,449	13,751	521	6,743	1,240	273	537	107	17	17
April	59,449	13,751	521	6,743	1,240	273	537	107	17	17
May	59,449	13,751	521	6,743	1,240	273	537	107	17	17
June	59,449	13,751	521	6,743	1,240	273	537	107	17	17
Total	\$ 1,378,256	\$ 318,796	\$ 12,070	\$ 156,333	\$ 28,738	\$ 6,322	\$ 12,453	\$ 2,491	\$ 383	\$ 1,915,842
Total O&M Project Cash Flow										\$ 1,915,842

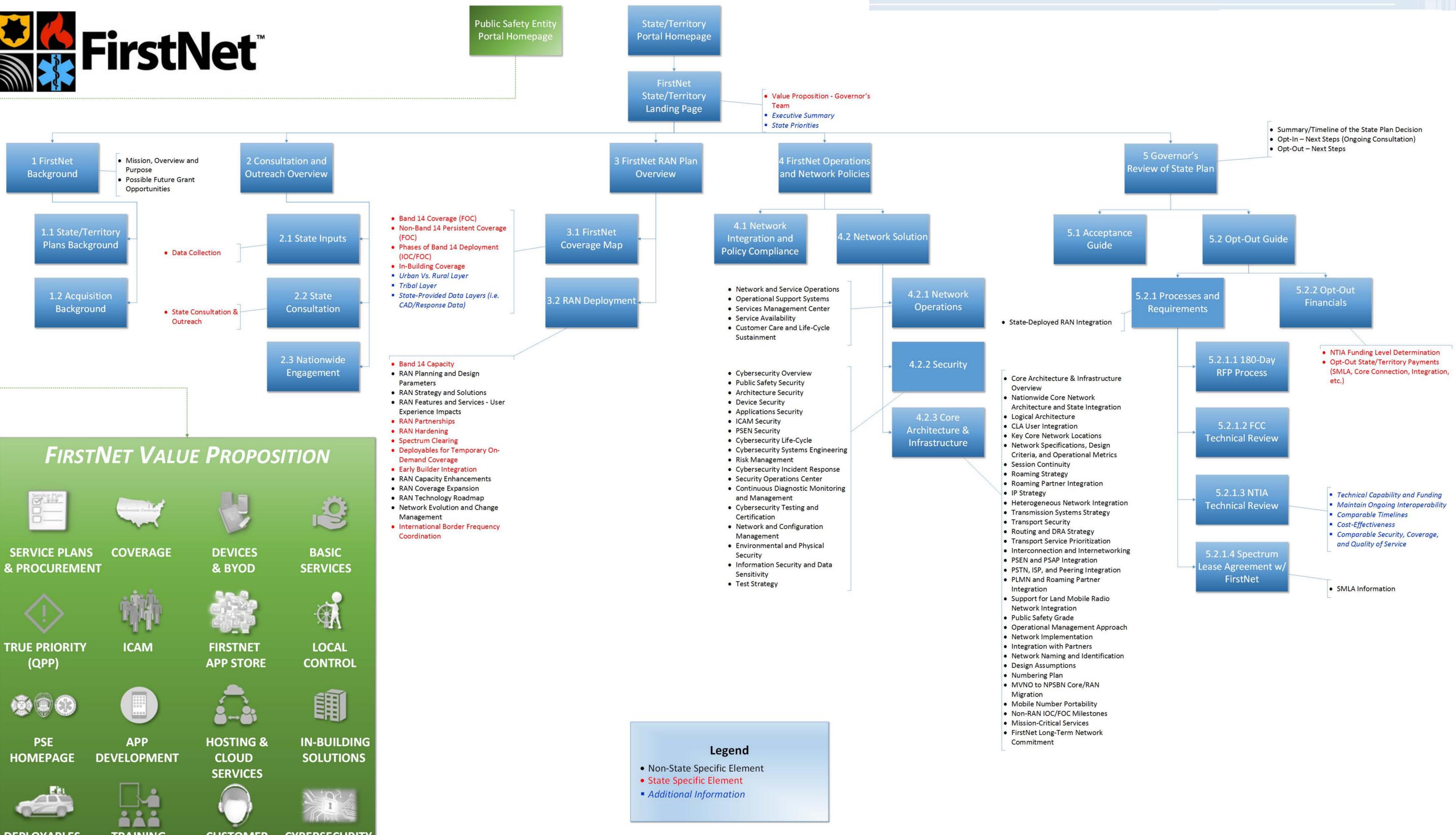
CAPITAL CASH FLOWS										
MONTH	MESA	GILBERT	SFM	CAJ	FT MCDOWELL	QUEEN CREEK	RIO VERDE	149	2,481	-
July	\$ 536,670	\$ 124,134	\$ 4,700	\$ 60,873	\$ 11,190	\$ 2,462	\$ 149	-	-	-
August	-	-	-	-	-	-	-	-	-	-
September	-	-	-	-	-	-	-	-	-	-
October (VHF)	331,688	93,329	40,239	-	-	28,430	2,481	-	-	-
November	-	-	-	-	-	-	-	-	-	-
December	-	-	-	-	-	-	-	-	-	-
January	-	-	-	-	-	-	-	-	-	-
February	-	-	-	-	-	-	-	-	-	-
March	-	-	-	-	-	-	-	-	-	-
April	-	-	-	-	-	-	-	-	-	-
May	-	-	-	-	-	-	-	-	-	-
June	-	-	-	-	-	-	-	-	-	-
Total	\$ 868,358	\$ 217,463	\$ 44,939	\$ 60,873	\$ 11,190	\$ 30,892	\$ 2,630	\$ -	\$ -	\$ -
Total Capital Projected Cash Flow										\$ 1,236,346



	<u>FY 17/18</u>
Total Operating & Maintenance Budget	\$ 1,914,461
Capital Network Reliability Improvements	<u>1,236,346</u>
ENDORSED BUDGET (O&M + Capital)	<u>\$ 3,150,807</u>

Current & Proposed Motorola Services

<u>7/800 MHz Services</u>	<u>Current Services</u>	<u>Proposed Services</u>
System Software Upgrades Every 2 Years	Motorola	Motorola
Core Hardware Upgrades for Master & Prime Sites and (Main & Backup)	Motorola	Motorola
Technical Support Service	Motorola	Motorola
Security Update Service	Motorola	Motorola
City of Mesa Console On-site Support	Mesa	Motorola
City of Mesa Console Technical Support	Motorola ¹	Motorola
City of Apache Junction Consoles On-site & Technical Support	Motorola ¹	Motorola
Town of Gilbert Console On-site & Technical Support	Motorola ¹	Motorola
Fort McDowell Yavapai Nation Console On-site & Technical Support	Motorola ²	Motorola
Mesa Fire & Medical Regional Dispatch Center On-site & Technical Support	n/a	Motorola
Security & Network Monitoring Service	Mesa	Motorola
Remote Security Upgrade Service	Mesa ³	Motorola
Dispatch Service	Mesa	Motorola
On-site Service (7x24, 4-hour response)	Mesa ⁴	Motorola
Network Preventative Maintenance	Mesa ⁴	Motorola
<u>Fire Hazard Zone (VHF) Services</u>		
System Software Upgrades Every 2 Years	n/a	Motorola
Core Hardware Upgrades	n/a	Motorola
Technical Support Service	n/a	Motorola
Dispatch Service	n/a	Motorola
On-site Service (7x24, 4-hour response)	n/a	Motorola
Network Preventative Maintenance	n/a	Motorola
Infrastructure Repair / Advance Replacement Services	n/a	Motorola
¹ Under Separate Agreement		
² Under Warranty		
³ Applied Manually on a Quarterly Basis		
⁴ Except Apache Junction, Gilbert, and Fort McDowell Yavapai Nation Consoles		



FIRSTNET VALUE PROPOSITION

SERVICE PLANS & PROCUREMENT	COVERAGE	DEVICES & BYOD	BASIC SERVICES
TRUE PRIORITY (QPP)	ICAM	FIRSTNET APP STORE	LOCAL CONTROL
PSE HOMEPAGE	APP DEVELOPMENT	HOSTING & CLOUD SERVICES	IN-BUILDING SOLUTIONS
DEPLOYABLES	TRAINING	CUSTOMER CARE	CYBERSECURITY

Legend

- Non-State Specific Element
- State Specific Element
- Additional Information

FOR PLANNING PURPOSES ONLY – FINAL PORTAL WILL CHANGE



FY2016/17
 Finance Update
 Through November 30, 2016

FY2016/17 Finance Update

Description	Fiscal Year Budget	As of November 30, 2016		\$ Var From YTD Budget Increase/(Decrease)	% Var
		YTD Budget*	YTD Actuals		
Personnel Services	492,000	189,231	158,016	(31,215)	-16%
Sub-total Personnel Services	\$492,000	\$189,231	\$158,016	(\$31,215)	-16%

Brand new equipment results in fewer issues. Motorola handled warranty work and maintenance through Oct 1

*YTD Budget represents 5 months of operational costs plus any contractual expenses already incurred (i.e. one time payments such as Insurance Premiums, Land Rental and Motorola Contract).

FY2016/17 Finance Update

Description	As of November 30, 2016					Comments
	Fiscal Year Budget	YTD Budget*	YTD Actuals	\$ Var From YTD Budget Increase/(Decrease)	% Var	
Insurance Premiums	10,600	-	-	-	0%	
Professional Services - Legal	37,000	15,417	10,943	(4,474)	-29%	Decreased utilization of legal services for ARCRA over the last couple months Includes 3 months of Dshaw, now coded to Prof Svcs. \$5K prior year;
Temp Services	90,000	37,500	35,244	(2,256)	-6%	MDiffenbaugh
Land Rental	24,600	15,000	14,724	(276)	-2%	
Professional Services - Other	13,100	5,458	20,264	14,806	271%	Includes reclass of Temp Services \$14K
Professional Services - Consulting	10,000	4,167	-	(4,167)	-100%	Budget for grant services not utilized
Utilities	72,500	30,208	21,598	(8,610)	-29%	Continue to realize savings of 20% compared to FY2015
Telephone	5,700	2,375	1,221	(1,154)	-49%	
Repairs & Maintenance Outside	10,400	4,333	988	(3,345)	-77%	
Equipment Usage (Vehicles)	20,000	8,333	5,709	(2,624)	-31%	
All Other Services	2,000	833	168	(665)	-80%	
Sub-total Services	\$295,900	123,625	\$110,859	(\$12,766)	-10%	

*YTD Budget represents 5 months of operational costs plus any contractual expenses already incurred (i.e. one time payments such as Insurance Premiums, Land Rental and Motorola Contract).

FY2016/17 Finance Update

Description	As of November 30, 2016					Comments
	Fiscal Year Budget	YTD Budget*	YTD Actuals	\$ Var From YTD Budget Increase/(Decrease)	% Var	
Contract - Preventative Motorola	645,000	645,000	653,104	8,104	1%	Annual increase on contract
Materials & Parts	37,600	15,667	3,032	(12,635)	-81%	Utilized as needed
Non Cap Assets	60,000	25,000	39,796	14,796	59%	3 of 4 Battery installations, \$13K ea
Software Maintenance- Juniper	21,000	21,000	20,214	(786)	-4%	
All Other Commodities	1,000	417	-	(417)	-100%	
Sub-total Commodities	\$764,600	\$707,083	\$716,146	\$9,063	1%	

*YTD Budget represents 5 months of operational costs plus any contractual expenses already incurred (i.e. one time payments such as Insurance Premiums, Land Rental and Motorola Contract).

FY2016/17 Finance Update

Description	Fiscal Year Budget	As of November 30, 2016		\$ Var From YTD Budget Increase/(Decrease)	% Var
		YTD Budget*	YTD Actuals		
Subtotal O&M	1,552,500	1,019,939	985,021	(34,918)	-3%
Contingency - 5% of total O&M	77,625	-	-	-	0%
Total	\$1,630,125	\$1,019,939	\$985,021	(\$34,918)	-3%

*YTD Budget represents 5 months of operational costs plus any contractual expenses already incurred (i.e. one time payments such as Insurance Premiums, Land Rental and Motorola Contract).

FY2016/17 Finance Update

	Fiscal Year Budget	As of November 30, 2016				Estimated 6 month Avg	
		YTD Budget	YTD Billed	Variance Increase (Decrease)	% Var	Airtime	Airtime
Operations							
COM	1,179,721	738,130	722,457	(15,673)	-2%	72.37%	72.96%
TOG	275,165	172,166	158,191	(13,975)	-8%	16.88%	16.30%
SFM	6,847	4,284	6,629	2,345	55%	0.42%	0.65%
CAJ	116,717	73,028	76,209	3,181	4%	7.16%	7.80%
TQC	4,890	3,060	3,247	187	6%	0.30%	0.34%
RVFD	326	204	196	(8)	-4%	0.02%	0.02%
SWA	10,596	6,630	6,449	(181)	-3%	0.65%	0.65%
AMR	2,608	1,632	1,299	(333)	-20%	0.16%	0.13%
FTM	33,255	20,807	10,344	(10,463)	-50%	2.04%	1.15%
Total	1,630,125	1,019,939	985,021	(34,918)	-3%	100%	100%

FY2016/17 Finance Update

As of November 30, 2016							
	Fiscal Year Budget	YTD Budget	YTD Billed	Variance Increase (Decrease)	% Var	Estimated Airtime	6 month Avg Airtime
Capital Projects							
COM	316,526	316,526	323,032	6,506	2%	73.0%	73.5%
TOG	73,828	73,828	69,215	(4,613)	-6%	17.0%	16.43%
SFM	1,837	1,837	3,017	1,180	64%	0.4%	0.66%
CAJ	31,316	31,316	33,055	1,739	6%	7.2%	7.86%
TQC	1,312	1,312	1,443	131	10%	0.3%	0.34%
RVFD	87	87	87	-	0%	0.0%	0.02%
FTM	8,922	8,922	3,979	(4,943)	-55%	2.1%	1.16%
Total	433,828	433,828	433,828	-	0%	100%	100%

FY2016/17 Finance Update

As of November 30, 2016							
	Fiscal Year Budget	YTD Budget	YTD Billed	Variance Increase (Decrease)	% Var	Estimated Airtime	6 month Avg Airtime
VHF Special Assessment							
VHF Capital							
COM	457,923	448,452	425,804	(22,647)	-5%	66.9%	66.85%
TOG	128,849	126,184	119,812	(6,372)	-5%	18.8%	18.81%
SFM	55,554	54,405	51,657	(2,747)	-5%	8.1%	8.11%
TQC	39,251	38,439	36,498	(1,941)	-5%	5.7%	5.73%
RVFD	3,425	3,354	3,185	(169)	-5%	0.5%	0.50%
Total	685,000	670,833	636,956	(33,877)	-5%	100.0%	100.0%

FY2016/17 Finance Update

As of November 30, 2016							
Fiscal Year Budget	YTD Budget	YTD Billed	Variance		Estimated 6 month Avg		
			Increase (Decrease)	% Var	Airtime	Airtime	
Total Topaz							
COM	1,954,170	1,503,108	1,471,293	(31,814)	-2%	72.37%	72.96%
TOG	477,842	372,177	347,218	(24,960)	-7%	16.88%	16.30%
SFM	64,237	60,525	61,303	778	1%	0.42%	0.65%
CAJ	148,033	104,344	109,264	4,920	5%	7.16%	7.80%
TQC	45,453	42,811	41,188	(1,623)	-4%	0.30%	0.34%
RVFD	3,838	3,645	3,468	(177)	-5%	0.02%	0.02%
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AMR	2,608	1,632	1,299	(333)	-20%	0.16%	0.13%
FTM	42,177	29,729	14,323	(15,406)	-52%	2.04%	1.15%
Total	2,748,953	2,124,600	2,055,805	(68,795)	-3%	100%	100%





FISCAL YEAR TO DATE ACTUALS
As of November 30, 2016

OPERATIONS, MAINTENANCE,
SPECIAL ASSESSMENT AND CAPITAL

PRESENTED
December 15, 2016

TOPAZ

Operating and Maintenance Variance Analysis

Fiscal Year 2016 / 2017

As of November 30, 2016

Description	Fiscal Year Budget	YTD Budget*	YTD Actuals	\$ Var From YTD Budget Increase/(Decrease)	% Var	Comments
Personnel Services	492,000	189,231	158,016	(31,215)	-16%	Brand new equipment; less issues. Motorola handled warranty work and maintenance through Oct 1.
Sub-total Personnel Services	\$492,000	\$189,231	\$158,016	(\$31,215)	-16%	
Insurance Premiums	10,600	-	-	-	0%	Decreased utilization of legal services for ARCRA over the last couple months
Professional Services - Legal	37,000	15,417	10,943	(4,474)	-29%	
Temp Services	90,000	37,500	35,244	(2,256)	-6%	Includes 3 months of Dshaw, now coded to Prof Svrcs. \$5K prior year; MDiffenbaugh
Land Rental	24,600	15,000	14,724	(276)	-2%	Includes reclass of Temp Services \$14K
Professional Services - Other	13,100	5,458	20,264	14,806	271%	
Professional Services - Consulting	10,000	4,167	-	(4,167)	-100%	Budget for grant services not utilized
Utilities	72,500	30,208	21,598	(8,610)	-29%	Continue to realize savings of 20% compared to FY2015
Telephone	5,700	2,375	1,221	(1,154)	-49%	Continued to realize savings of 20% compared to FY2015
Repairs & Maintenance Outside	10,400	4,333	988	(3,345)	-77%	
Equipment Usage (Vehicles)	20,000	8,333	5,709	(2,624)	-31%	Continued to realize savings of 20% compared to FY2015
All Other Services	2,000	833	168	(665)	-80%	
Sub-total Services	\$295,900	123,625	\$110,859	(\$12,766)	-10%	
Contract - Preventative Motorola	645,000	645,000	653,104	8,104	1%	Annual increase on contract
Materials & Parts	37,600	15,667	3,032	(12,635)	-81%	Utilized as needed
Non Cap Assets	60,000	25,000	39,796	14,796	59%	3 of 4 Battery installations, \$13K ea
Software Maintenance- Juniper	21,000	21,000	20,214	(786)	-4%	Continued to realize savings of 20% compared to FY2015
All Other Commodities	1,000	417	-	(417)	-100%	
Sub-total Commodities	\$764,600	\$707,083	\$716,146	\$9,063	1%	
Subtotal O&M	1,552,500	1,019,939	985,021	(34,918)	-3%	
Contingency - 5% of total O&M	77,625	-	-	-	0%	
Total	\$1,630,125	\$1,019,939	\$985,021	(\$34,918)	-3%	

*YTD Budget represents 5 months of operational costs plus any contractual expenses already incurred (i.e. one time payments such as Insurance Premiums, Land Rental and Motorola Contract).

TOPAZ Regional Wireless Cooperative

Partner Allocations

Fiscal Year 2016/17

As of November 30, 2016

	Fiscal Year Budget	YTD Budget	YTD Billed	Variance		Estimated Airtime	6 month Avg Airtime
				Increase (Decrease)	% Var		
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Date: December 15, 2016
To: TOPAZ Regional Wireless Cooperative (TRWC) Board of Directors
Through: Dale Shaw, TRWC Executive Director
From: Randy Thompson
Subject: Administrator Update

Capital Projects

- 1) **Fire Hazard Zone Communication Infrastructure.** This infrastructure will enable the Mesa Fire & Medical Regional Dispatch Alarm Room to communicate with the mobile and portable radios in Fire Hazard or Hot Zones, which will be operating on Very High Frequency (VHF, 150-174 MHz) radio frequencies in analog simplex mode. The funding for this project is shown in the TRWC budget. The project milestones with status and dates are shown in the Appendix.

Non-capital Projects

- 1) **Site Battery Lifecycle Upgrade.** The batteries that back up the TOPAZ voice radio network and other equipment at the remote radio sites and the City of Mesa Communications Building were over 14 years old and had reached the end of their service life. This project is now complete. The installation dates and expected next replacement date are shown in the Appendix.
- 2) **Florence Gardens TOPAZ site.** Utilizing some of the equipment removed from Thompson Peak when that site was upgraded to create a 4-channel TOPAZ 800 MHz trunked site at the Florence Gardens site near Florence, AZ. This will enable the City of Mesa Gas Utility to communicate with resources in Mesa when they are providing service in the Magma Gas Service Area without manually switching their radios. This site will benefit TOPAZ members when traveling to the Pinal County Jail. This site went into service in mid-October.

Unfortunately, this upgrade has exposed a weakness in the point-to-point microwave radio network which causes the site to have brief periods of disconnection from the TOPAZ core due to the configuration of the network. We are working with the City of Mesa Information Technology Department on solutions to the problem.

- 3) **7.16 Upgrade.** The TOPAZ infrastructure software will be upgraded June 5-15, 2017. This upgrade is covered under the Motorola System Upgrade Assurance II contract, so there is no additional cost to the TRWC. Brief periods of "site trunking" will be encountered during the upgrade, and notices will be sent out by the upgrade project manager closer to the actual events.

Operations Summary

Unscheduled Impairments – Please see the unscheduled impairments chart on page 3. Since the last Administrator update on September 29, 2016, there were 2 unscheduled impairments to the network, as follows:

TRWC Administrator Update, December 15, 2016

- 1) October 4, 2016: The TRW and FS264 sites were out of service for nearly a minute each due to network router problems. We are working with the City of Mesa Information Technology Department to find a solution to these problems.
- 2) October 31, 2016: The TOPAZ simulcast cell was in “site trunking” for 28 seconds due to human error. An engineer was tracing a cable which was either not installed properly or is defective and caused the disruption in service. It has been reinforced that even “non-invasive” work needs to be scheduled during a maintenance window to avoid unscheduled impairments to the TOPAZ network.

Airtime and Radio Counts – the following charts are included:

- 1) Six month rolling average airtime usage by member for fiscal year 2017 through November, 2016.
- 2) Average number of radios enabled by member for fiscal year 2017 through November, 2016.
- 3) Six month rolling average airtime usage by service type for fiscal year 2017 through November, 2016.
- 4) Average number of radios enabled by service type for fiscal year 2017 through November, 2016.

Peak Channel Usage – the following charts are included:

- 1) Peak channel usage for each site for September, 2016, through November, 2016 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:

Month	Simulcast Cell	Florence Gardens	Shaw Butte	Thompson Peak
September, 2016	0	n/a	6	0
October, 2016	0	2	8	0
November, 2016	0	1	9	0

- a. Although all channels were in use on several occasions as shown above, no system busies have been reported.
- b. Since the Shaw Butte site consistently has all channels in use, we are going to install the spare equipment for the Shaw Butte site to provide a 6th operational channel. We have had few to no equipment failures with the equipment at the Shaw Butte site, and will simply revert the site to the current compliment of 5 channels in the event of an equipment failure.

Upcoming Events:

- 1) Testing of Dynamic Site Resiliency (backup radio master site) and geo-redundant prime site (simulcast) capability is planned for January, 2017.
- 2) The next City of Mesa Communications Building (quarterly) simulated power outage testing is planned for 5:00 AM on January 11, 2017.

Other News:

- 1) **Potential Point-to-Point Microwave Radio Interference.** Higher Ground LLC, a mobile satellite earth station startup business, has applied to the Federal Communications Commission (FCC) for a nationwide license to operate mobile satellite earth station transmitters in the 6 GHz radio frequency band. This is the same radio frequency band utilized by the TRWC and other Public

TRWC Administrator Update, December 15, 2016

Safety communications networks for point-to-point microwave radio service, which connects the TOPAZ radio sites to each other and together as a network. The Higher Ground system utilizes an attachment to a cellular telephone that would enable consumer-based text messaging, e-mail, and “Internet of Things” communications via geostationary satellites.

Higher Ground’s application to the FCC requests waiver of two very important rules, as follows:

- a) Authorization of mobile operations in a Fixed Service radio frequency band; and
- b) Bypassing the required frequency coordination process

The concern is that bypassing these rules could result in interference to point-to-point microwave radio links which carry mission critical Public Safety communications.

The objections to Higher Ground’s application were filed with the FCC as discussed at the September 29th TRWC Board of Directors meeting. The matter is still pending before the FCC’s International Bureau.

- 2) **UTC Leap Second.** On December 31, 2016, at 23:59:59 UTC (4:59:59 PM Mountain Standard Time), a leap second will be added to Coordinated Universal Time (UTC) to keep atomic clocks in sync with the earth’s ever-slowng rotation. We are checking with Motorola to ensure that this leap second will not cause any unexpected behavior of the TOPAZ network.

TRWC Administrator Update, December 15, 2016

Appendix

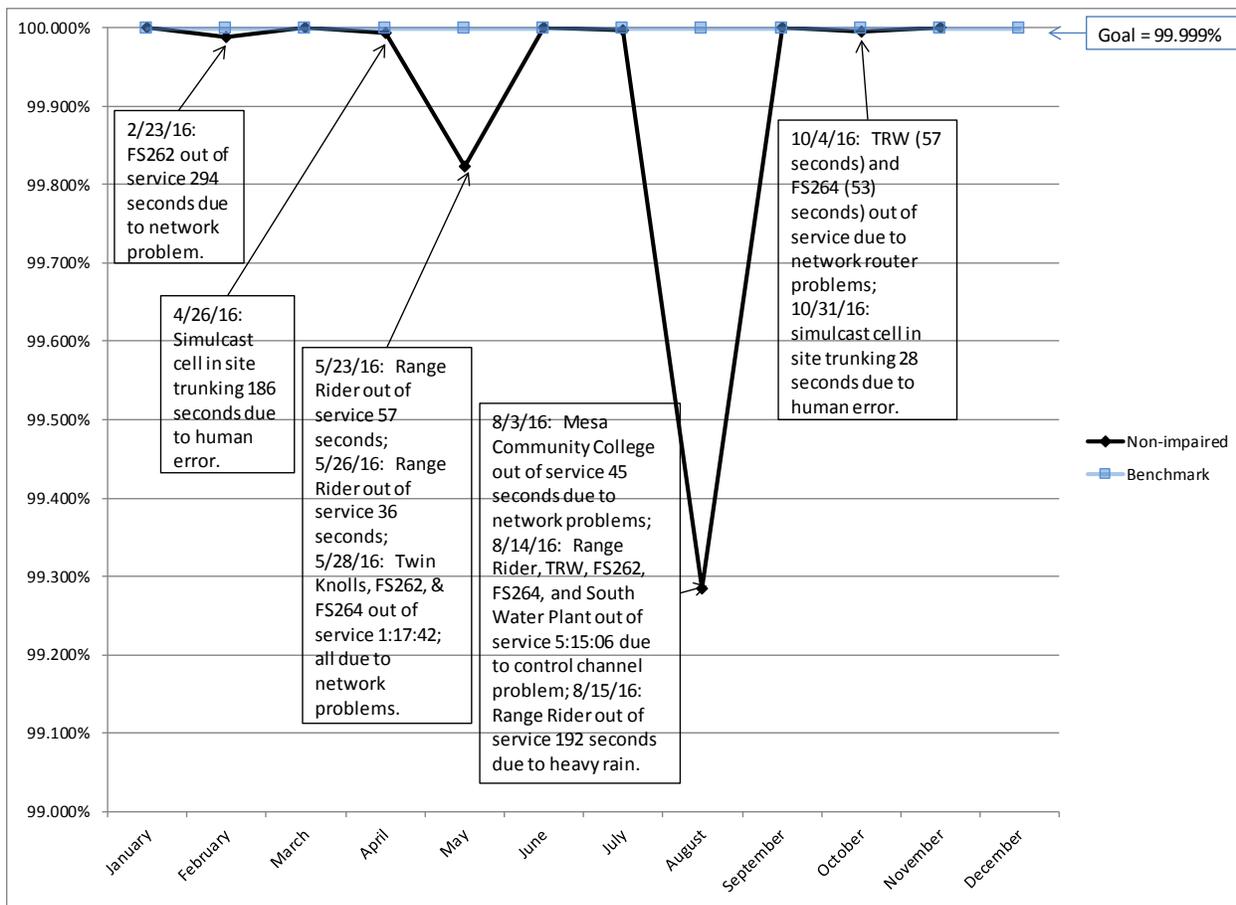
Fire Hazard Zone Communications Infrastructure Schedule

Milestone	Status	Date
Contract awarded to Motorola Solutions	Complete	September 28, 2015
First payment of \$600,000	Complete	November 12, 2015
Second payment of \$600,000	Complete	September 8, 2016
Frequency acquisition	Complete	October 19, 2016
Equipment ordering	Complete	October, 2016
Equipment staging at Motorola Solutions in Illinois	Complete	December 6-7, 2016
Site preparation	Upcoming - Planned	January-February, 2017
Shipment of equipment from Motorola Solutions in Illinois	Upcoming - Planned	Week of December 12, 2016
Installation of equipment at sites	Upcoming - Planned	January-February, 2017
Optimization & testing of equipment	Upcoming - Planned	March-April, 2017
Acceptance testing	Upcoming - Planned	April-May, 2017
System Acceptance	Upcoming - Planned	June, 2017

Site Battery Lifecycle Upgrade Dates

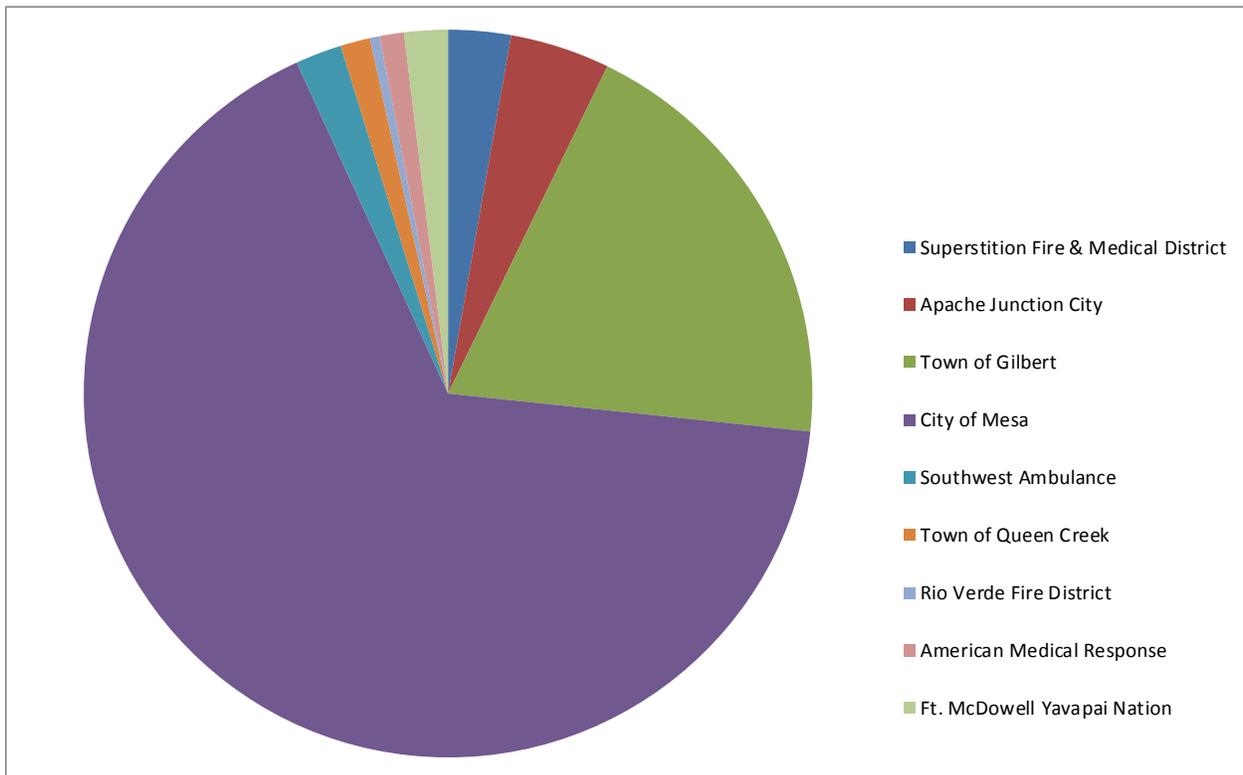
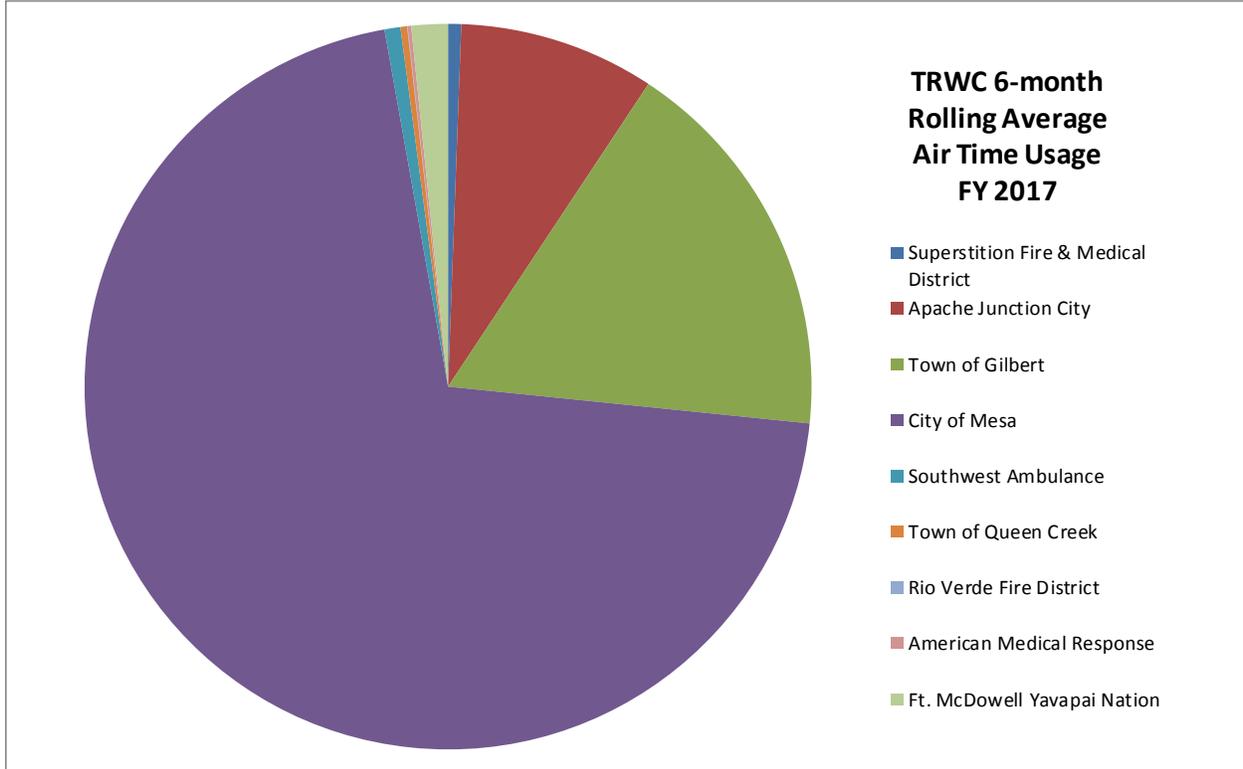
Site	Battery Upgrade Complete	Next Battery Upgrade
Superstition Fire & Medical Station 262	October 9, 2014	October, 2024
Superstition Fire & Medical Station 264	December 16, 2014	December, 2024
Twin Knolls South	February 24, 2015	February, 2025
FS205	July 28, 2015	July, 2025
EMSC	October 13, 2015	October, 2025
Twin Knolls North (funded by Maricopa County site colocation)	December 8, 2015	December, 2025
TRW (funded by Maricopa County site colocation)	January 5, 2016	January, 2026
Falcon Field	April 5, 2016	April, 2026
Communications Building	April 12, 2016	April 2026
Range Rider (FY17 budget)	August 3, 2016	August, 2026
CRS (FY17 budget)	September 22, 2016	September, 2026
South Water Plant (FY17 budget)	October 26, 2016	October, 2026

TRWC Administrator Update, December 15, 2016

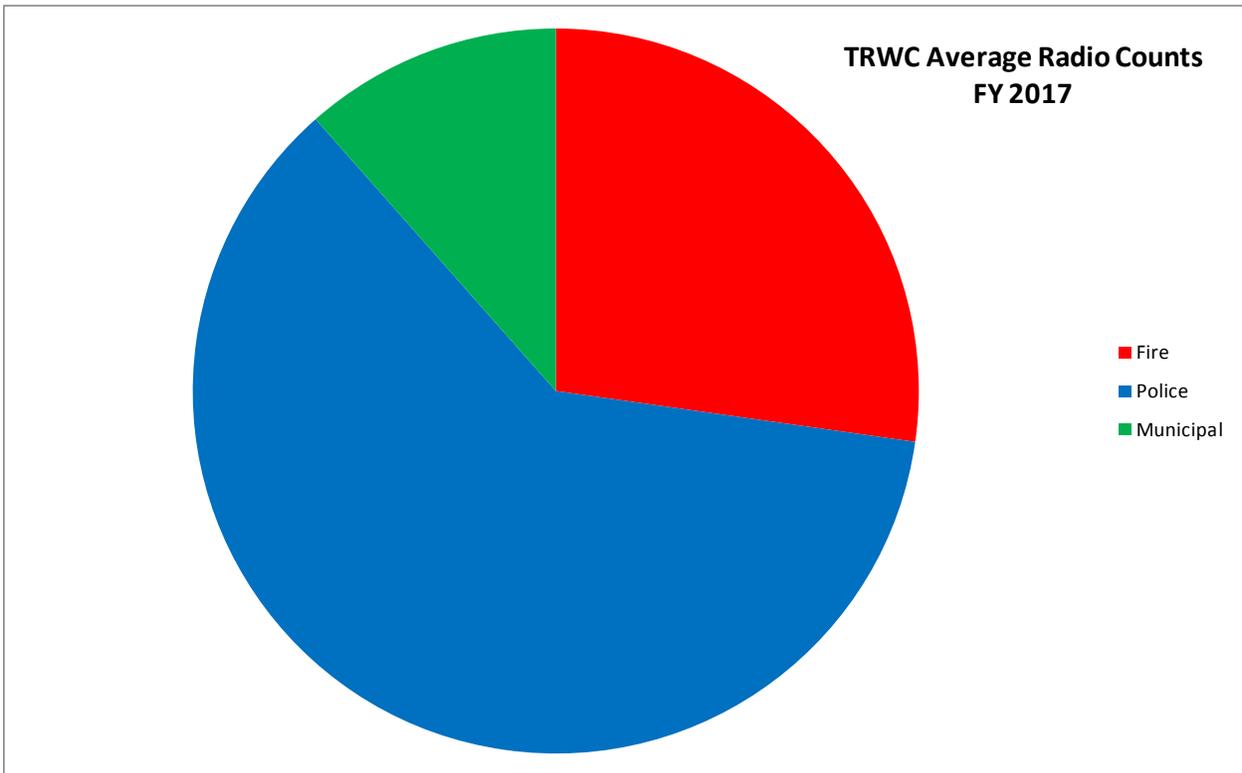
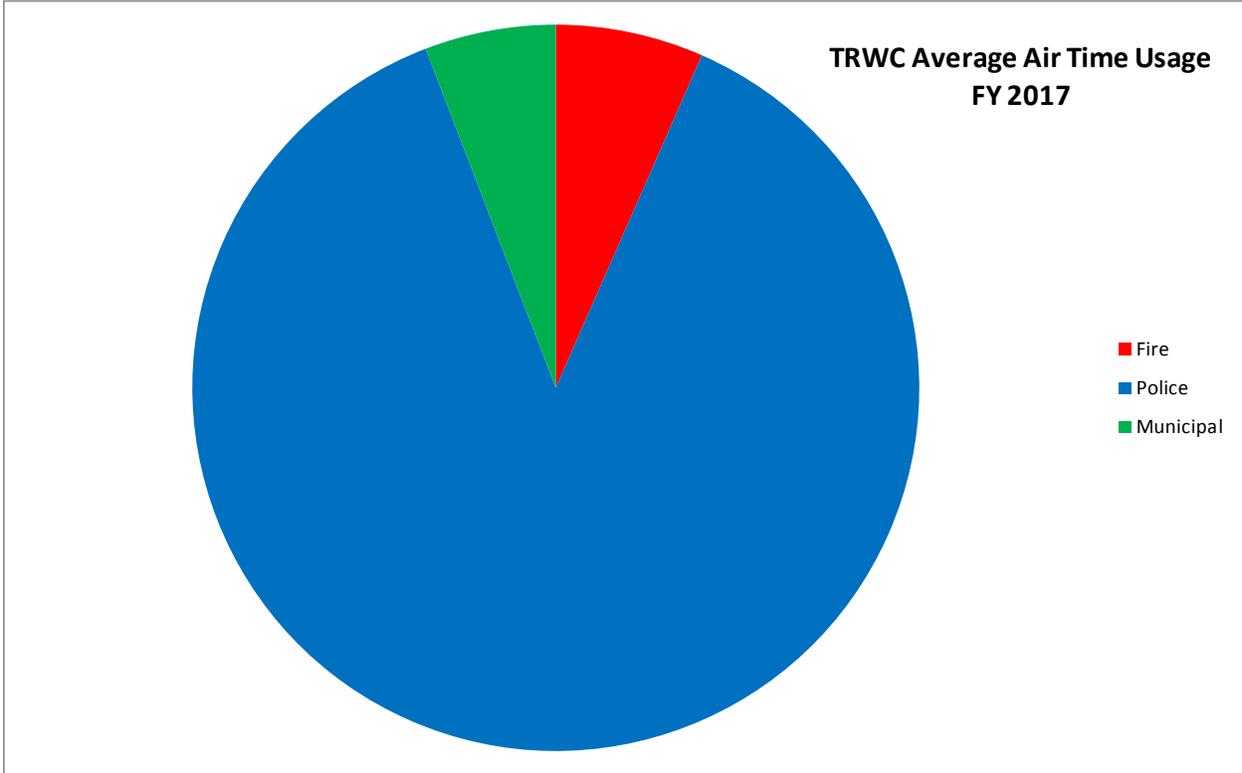


Unscheduled System Impairment, January, 2016 through November, 2016

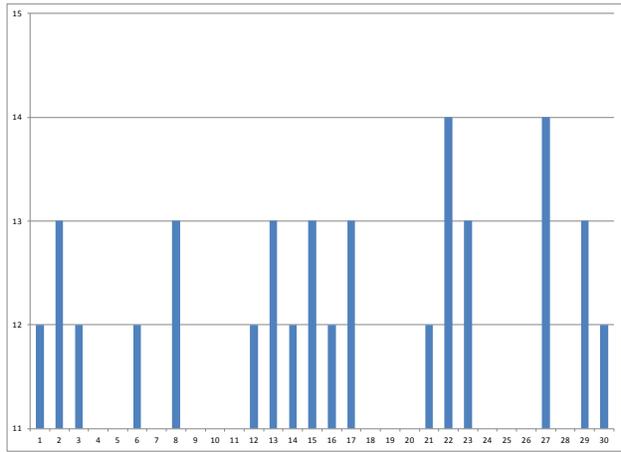
TRWC Administrator Update, December 15, 2016



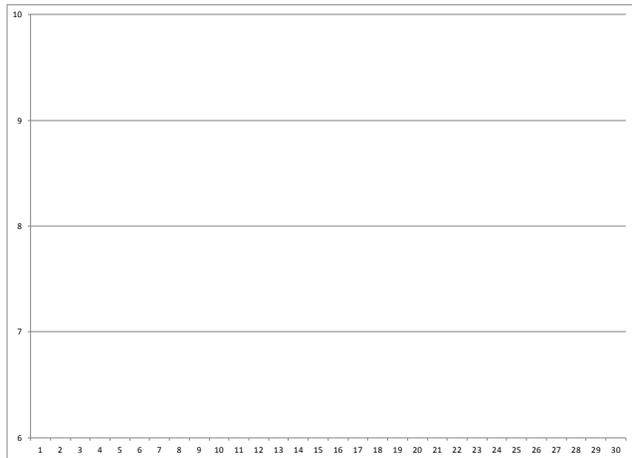
TRWC Administrator Update, December 15, 2016



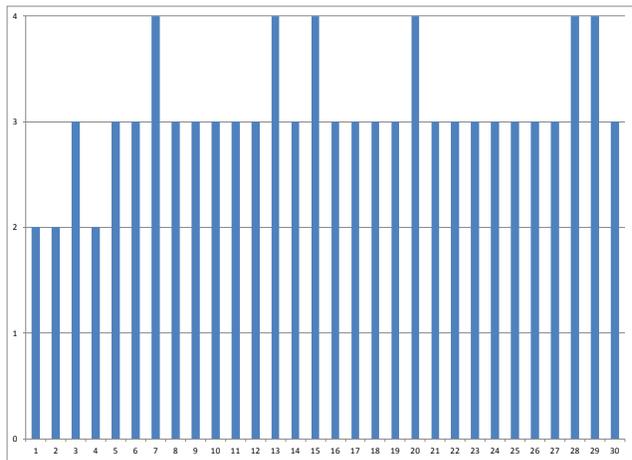
TOPAZ Peak Channel Usage, September, 2016



Simulcast Cell

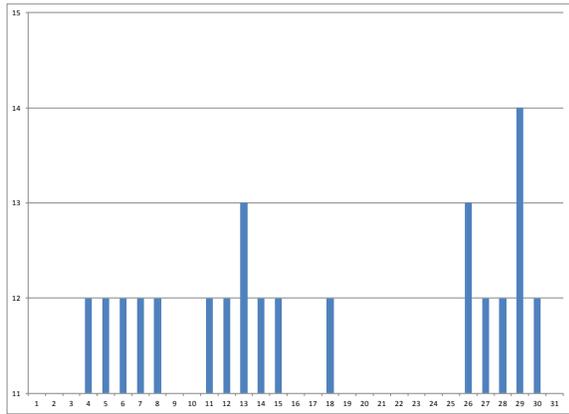


Thompson Peak

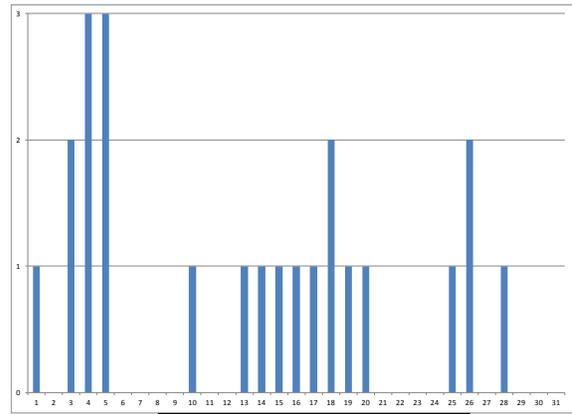


Shaw Butte

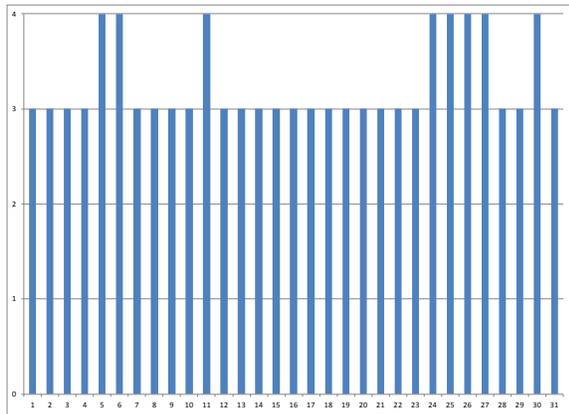
TOPAZ Peak Channel Usage, October, 2016



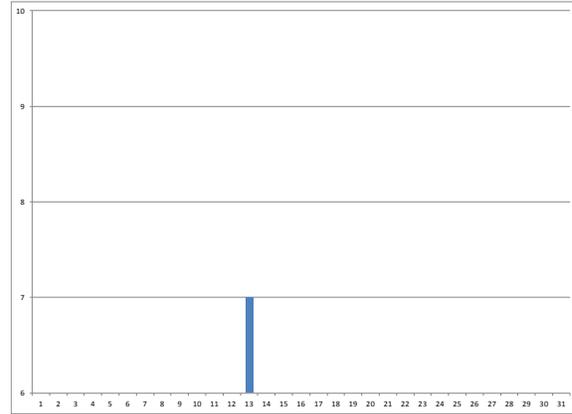
Simulcast Cell



Florence Gardens

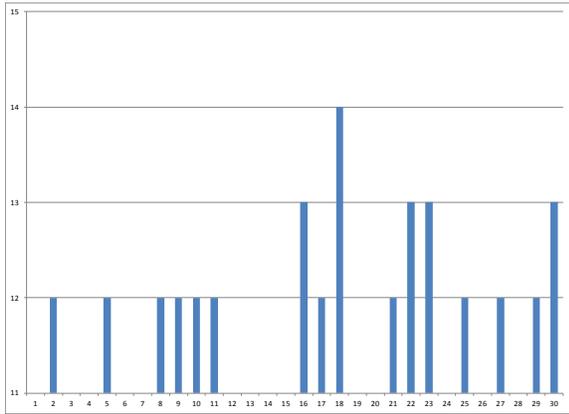


Shaw Butte

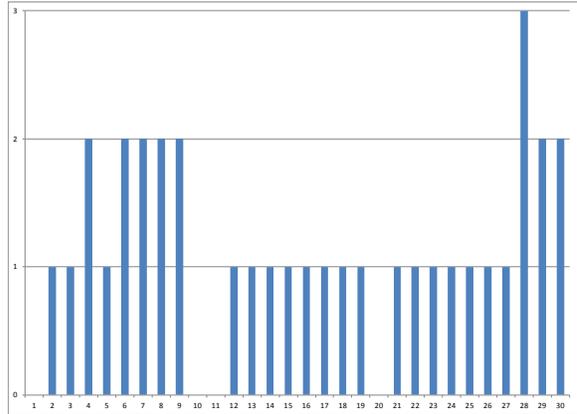


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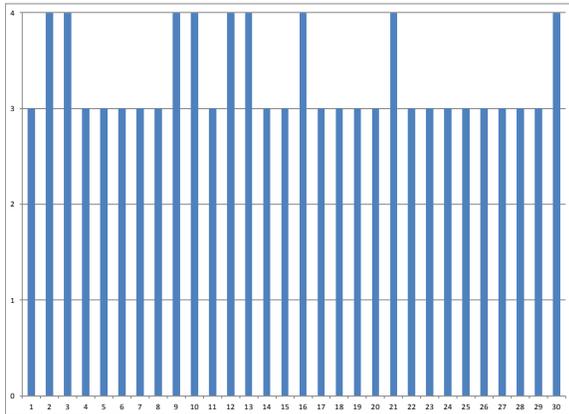
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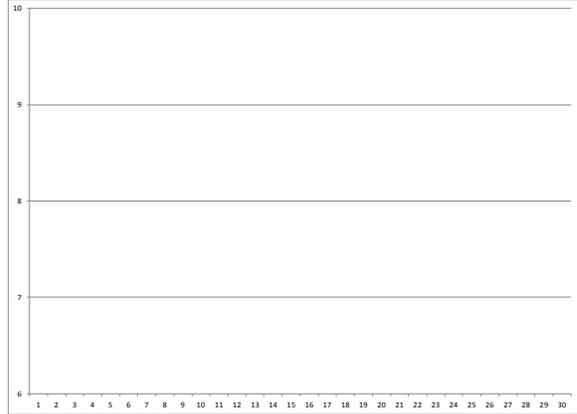
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