East Bay Regional Communications System Authority

Participating agencies include Alameda and Contra Costa Counties and the following cities and special districts: Alameda, Albany, Antioch, Berkeley, Brentwood, Clayton, Concord, Danville, Dublin, El Cerrito, Emeryville, Fremont, Hayward, Hercules, Lafayette, Livermore, Martinez, Moraga, Newark, Oakley, Pinole, Pittsburg, Pleasant Hill, Pleasanton, Richmond, San Leandro, San Pablo, San Ramon, Union City, Walnut Creek, East Bay Regional Park District, Kensington Police Community Services District, Livermore Amador Valley Transit Authority, Moraga-Orinda Fire District, Rodeo-Hercules Fire District, San Ramon Valley Fire District, California Department of Transportation, Ohlone Community College District, Contra Costa Community College District, Dublin-San Ramon Services District and University of California, Berkeley

OPERATIONS COMMITTEE MEETING

NOTICE OF REGULAR MEETING **DATE: November 6, 2020**

TIME: 10:00 a.m.

PLACE: Alameda County Office of Homeland Security and Emergency Services,
Room 1013
4985 Broder Blvd., Dublin, CA 94568

Meeting Procedure During Coronavirus (COVID-19) Outbreak:

In keeping with the guidelines provided by the State of California and Alameda County Department of Public Health regarding gatherings during the coronavirus (COVID-19) outbreak, and recommendations to follow social distancing procedures, the East Bay Regional Communications System Authority (EBRCSA) will adopt the following practices during upcoming Operations Committee meeting:

- The EBRCSA Operations Committee will hold the meetings remotely via WebEx Video Communications.
- The Public will have access to the meeting via a telephonic option.
  The Public will have access to the meeting by calling: 16699009128 Meeting ID: 912 1152 0954 Passcode: 027932
- The Public will have access to all materials via the EBRCSA Web Site, http://www.ebrcsa.org/default.page. The material will be under the header Calendar, then Operations Committee, and then September 4th date.
- The Public will be asked if there is any comment or question concerning the meeting during the Public Comment Period and as each item is discussed.
- The Speaker may provide their name for the record, if they so choose

AGENDA

1. Call to Order/Roll Call

2. Public Comments (Meeting Open to the Public):
   At this time, the public is permitted to address the Committee on items within the Committee's subject matter jurisdiction that do not appear on the agenda. Please limit comments to a maximum of three (3) minutes. If you wish to comment on an item that is on the agenda, please wait until the item is read for consideration.

3. Approval of Minutes of the September 4, 2020 Regular Operations Committee Meeting

4. Provide Direction on Budget Adjustments FY 19/20 and FY 20/21

5. Provide Direction regarding Transition of EBRCSA to Ethernet/MPLS (Multiprotocol Label Switching)

6. Provide Direction regarding Appointment of Two Members of Operations Committee to a Sub Committee to assist in Recommendation of Compensation for Executive Director

7. 2021 EBRCSA Draft Calendar Committee and Board Meetings

8. Discussion of Nominations for the Board of Directors Chair and Vice Chair to be Voted on and Take Effect at the Close of the Meeting on December 4, 2020

9. Receive Information on Public Safety Power Shutdowns and Impact to EBRCSA

10. Receive an Update on the City of Antioch

11. Receive an Update on the City Vallejo

12. Receive an Update on TDMA – Time Division Multiple Access

13. Receive information regarding California Department of Justice Bulletin regarding Encryption

14. Agenda Items for Next Meeting

15. Adjournment

This AGENDA is posted in accordance with Government Code Section 54954.2(a)
If requested, pursuant to Government Code Section 54953.2, this agenda shall be made available in appropriate alternative formats to persons with a disability, as required by Section 202 of the Americans with Disabilities Act of 1990 (42 U.S.C. Section 12132), and the federal rules and regulations adopted in implementation thereof. To make a request for disability-related modification or accommodation, please contact the EBRCSA at (925) 803-7802 at least 72 hours in advance of the meeting.
I hereby certify that the attached agenda was posted 72 hours before the noted meeting.

Tom McCarthy, Executive Director
November 2, 2020

AGENDA ITEM NO. 3.

AGENDA STATEMENT
OPERATIONS COMMITTEE MEETING
MEETING DATE: November 6, 2020

TO: Operations Committee
East Bay Regional Communications System Authority (EBRCSA)

FROM: Tom McCarthy, Executive Director
East Bay Regional Communications System Authority

SUBJECT: Approval of Minutes of the September 4, 2020 Regular Operations Committee Meeting

RECOMMENDATIONS:

Approve the minutes of the September 4. 2020 Regular Operations Committee Meeting.

SUMMARY/DISCUSSION:

The Operations Committee will consider approval of the minutes of the September 4, 2020 Regular Operations Committee Meeting.

RECOMMENDED ACTION:

It is recommended that the Committee approve the minutes of the September 4, 2020 Operations Committee Meeting.

East Bay Regional Communications System Authority

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OPERATIONS COMMITTEE MEETING

REGULAR MEETING **DATE: September 4, 2020**
TIME: 10:00 a.m.
PLACE: Alameda County Office of Homeland Security and Emergency Services, Room 1013
4985 Broder Blvd., Dublin, CA 94568

M I N U T E S

1. **Call to Order/Roll Call:** A Regular meeting of the Operations Committee was held on September 4, 2020, remotely via Zoom Video Communications. The meeting was called to order at 10:00 a.m.

   Committee Members Present:
   G. Ahern, Sheriff, Alameda County Sheriff's Office
   C. Nice, Assistant Sheriff, Alameda County Sheriff's Office
   T. Chalk, Captain, Contra Costa County Sheriff's Office
   N. Luby, Deputy Chief, Oakland Fire Department
   P. Meyer, Chief, San Ramon Valley Fire Protection District
   P. Mulligan, Chief of Inspectors, Contra Costa District Attorney
   J. Tudor, Police Chief, City of San Leandro

   Staff:
   T. McCarthy, Executive Director
   C. Soto, Administrative Assistant
   C. Boyer, Auditor

   Public:
   G. Poole, Motorola Representative
   Ali Hirsch, Aviat Representative

2. **Public Comments**: None.

3. Approval of Minutes of the June 12, 2020 Regular Operations Committee Meeting

On motion of Bm. Nice, seconded by Bm. Mulligan and by unanimous vote, the Operations Committee approved the minutes of the June 12, 2020 Regular Operations Committee meeting.

4. Provide Direction on Budget Adjustment FY 19/20 and FY 20/21

Authority Auditor Craig Boyer stated this item was for budget adjustments for FY19/20 and FY 20/21 budgets. The adjustments for FY19/20 were: a $3,000 increase in the HVAC maintenance budget due to unplanned repairs; $16,000 increase in microwave maintenance budget due to an additional invoice received for annual inspection and preventative maintenance; and $12,000 increase in utilities budget to account for utilities provided at various Alameda County radio sites. The $50,000 increase for FY 20/21 was for utilities provided at various Alameda County radio sites. These increases to the budgets were due to the timing of receipt of invoices.

On motion of Bm. Nice, seconded by Bm. Mulligan and by unanimous vote, the Operating Committee approved, for consideration by the full Board, approval of the budget adjustments presented for FY 19/20 and FY 20/21.

5. Provide Direction on Write-Off Policy

Authority Auditor Boyer stated this item would establish a policy that gives the Executive Direction the discretion, at the direction of the Board, to write off any receivables that are identified as not being collectable.

On motion of Bm. Nice, seconded by Mulligan unanimous vote, the Operating Committee recommended to the Board of Directors, the establishment of a policy of Receivable Write-Off.

6. Provide Direction concerning Transition of EBRCSA to Ethernet/MPLS (Multiprotocol Label Switching)

Director McCarthy presented the Staff Report and advised that this item involved transitioning to Ethernet/MPLS (Multiprotocol Label Switching). This was becoming the industry standard for land mobile radio. This was allowing them to have the Ethernet connection instead of the T-1 lines, and the MPLS which allowed data packets or voice, package it together, sends it to a determined site, with a label on it, accelerating it. It would upgrade the System from 10 Gigs to 11 Gigs, for increased speed. The System works, but in order to continue to work, the biannual upgrades to the System through the Service Upgrade Agreement with Motorola, all the new technology that would be part of the next release, required the System to be Ethernet/MPLS capable. It would take at least two years of work to get up to the Ethernet/MPLS for the next platform. The last upgrade was done in February 2020. For the next upgrade in 2022, the Authority would have to make the next upgrade. If they were not Ethernet/MPLS ready, it would not be completed or be delayed.

Options for this upgrade include utilizing Motorola Inc. and Aviat, which both currently support the System and can manage the whole project or a part of the project. The first option is to utilize Motorola Inc. as a prime contractor and Aviat as a subcontractor. This first option was presented

by Motorola with two financing options. The option from Aviat, was to use Aviat, and the Authority would be the oversite of the project utilizing Aviat, Motorola, and CSI for the upgrade.

Bm. Ahern asked which option was the best operationally?

On motion of Bm. Luby, seconded by Bm. Nice and by unanimous vote, the Operations Committee recommended the Authority select Motorola for the implementation of Ethernet/MLPS.

7. Receive an Update on the City of Antioch

Director McCarthy stated the City of Antioch needed to retrench 875 ft of roadway for electricity for its site.

8. Receive an Update on the City Vallejo

Director McCarthy stated the cutover was still scheduled for September 14, 2020.

9. Receive an Update on TDMA – Time Division Multiple Access

Director McCarthy stated the transition cutover date was October 30, 2020. All equipment has been installed.

10. Receive an Update on 10 Year Plan

Director McCarthy stated there was a contract with CSI for 10-Year Plan. They were working on getting rid of surplus equipment.

11. Agenda Items for Next Meeting:

- New contract for Executive Director.

Bm. Luby recognized the work of EBRCSA staff. He had been working with fires and the only way they could get in touch with crews was with the System. The System was also used successfully at the recent protests. Board Chair Ahern stated the System had also been used on Mines Road during the recent fires and it had worked well.

12. Adjournment:

With no further business coming before the Operations Committee, the meeting was adjourned at 10:41 a.m.

Caroline P. Soto
Authority Secretary

East Bay Regional Communications System Authority

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AGENDA ITEM NO. 4.

AGENDA STATEMENT
OPERATIONS COMMITTEE
MEETING DATE: November 6, 2020

TO: Operations Committee
East Bay Regional Communications System Authority (EBRCSA)

FROM: Thomas G. McCarthy, Executive Director
East Bay Regional Communications System Authority

SUBJECT: Budget Adjustments FY 19/20 and FY 20/21

RECOMMENDATIONS:

Receive a report from the Executive Director regarding the FY 19/20 and FY 20/21 Budget Adjustments. It is recommended that the Committee recommend to the Board of Directors the budget for FY 19/20 and FY 20/21 based on the information discussed in this item.

SUMMARY/DISCUSSION:

Craig Boyer, Alameda County Auditor's Office, has prepared the FY 19/20 and FY 20/21 Budget Adjustments so that the Operations Committee will have information regarding the changes to the previous and current Fiscal Year Budgets.

RECOMMENDED ACTION:

It is recommended that the Committee discuss and reach a consensus for the Adjustments to the Fiscal Year Budget for FY 19/20 and FY 20/21 for presentation to the Board of Directors.

East Bay Regional Communications System Authority

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AGENDA ITEM 4A

STAFF REPORT OPERATIONS

COMMITTEEMEETING

NOVEMBER 6, 2020

SUMMARY:

Adjust the fiscal year 2019-20 budget for the following:

1. Increase HVAC maintenance budget due to unplanned repairs for leaking units and bearings that needed replacing.
2. Increase microwave maintenance budget due to an additional invoice received for annual inspection and preventative maintenance.
3. Increase utilities budget to account for utilities provided at various Alameda County radio sites.

Below is a summary of the proposed budget adjustments for FY2019-20:

REVENUES	
Operating Payments	$ 31,000
Total	31,000
EXPENSES	
HVAC Maintenance	3,000
Microwave Maintenance	16,000
Utilities	12,000
Total	$ 31,000

RECOMMENDED ACTION:

Staff recommends that the Committee approve the budget adjustment for fiscal year 2019-20.

East Bay Regional Communications System Authority

ALAMEDA COUNTY

CONTRA COSTA COUNTY

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AMENDED BUDGET
FISCAL YEAR 2019-20

Revenues		
Operating payments	$	6,400,000
Service payments		1,190,000
Grants		167,000
Interest		80,000
Total revenues		**7,837,000**
Expenses		
Administration		414,000
Audit fees		20,000
Insurance		30,000
Lease		70,000
Legal		20,000
Licenses and permits		30,000
Membership fees		10,000
Maintenance		3,603,000
Security		11,000
Utilities		172,000
Website hosting		4,000
Total operating expenses		**4,384,000**
Capital		2,067,000
Debt service		650,000
Total expenses		**7,101,000**
Net Income	**$**	**736,000**

EAST BAY REGIONAL COMMUNICATIONS SYSTEM
EXPENDITURE DETAIL
FISCAL YEAR 2019-2020

OPERATING EXPENSES	FY19-20 Approved	FY19-20 Amendment #3	FY19-20 Amended
Administration			
Executive director	$ 225,000	$ -	$ 225,000
Administrative assistant	40,000	-	40,000
Planning	134,000	-	134,000
Travel	5,000	-	5,000
Miscellaneous	10,000	-	10,000
Audit fees	20,000	-	20,000
Insurance	30,000	-	30,000
Lease	70,000	-	70,000
Legal	20,000	-	20,000
Licenses and permits	30,000	-	30,000
Membership fees	10,000	-	10,000
Maintenance			
Service agreement	1,065,000	-	1,065,000
Software maintenance (SUA II)	962,000	-	962,000
Network administration	260,000	-	260,000
HVAC maintenance	20,000	3,000	23,000
Generator maintenance	57,000	-	57,000
ALCO general maintenance	600,000	-	600,000
COCO general maintenance	230,000	-	230,000
CSI telecommunications	200,000	-	200,000
Microwave maintenance	180,000	16,000	196,000
Miscellaneous	10,000	-	10,000
Security	11,000	-	11,000
Utilities	160,000	12,000	172,000
Website hosting	4,000	-	4,000
Total expenses	**4,353,000**	**31,000**	**4,384,000**
CAPITAL EXPENDITURES			
TDMA Upgrade	1,665,000	-	1,665,000
DC Power Upgrade	250,000	-	250,000
Dispatch Consoles	152,000	-	152,000
Total expenditures	**2,067,000**	**-**	**2,067,000**
DEBT SERVICE			
Principal	454,000	-	454,000
Interest	196,000	-	196,000
Total expenses	**$ 650,000**	**$ -**	**$ 650,000**

1. Motorola service agreement increased due to a new 4 year contract
2. Network administration contract increased
3. TDMA Upgrade Expense is the annual payment for the Change Order approved by the Board of Directors
4. DC Power Updgrade Expense is an annual amount to replace the batteries in various locations

EAST BAY REGIONAL COMMUNICATIONS SYSTEM
PROJECTED CASH RESERVE BALANCES
FISCAL YEAR 2019-2020

Operating Reserve	FY18-19 Final Budget	FY18-19 Actual	FY19-20 Budget
Beginning Balance	$ 1,763,500	$ 1,799,648	$ 1,733,162
Operating Payments	5,900,000	5,006,740	6,400,000
Initial Payments	-	40,400	-
Interest	50,000	125,078	80,000
Operating Expenses	(4,038,000)	(3,466,323)	(4,384,000)
Transfer to Capital Reserve	(1,656,500)	(1,772,381)	(1,637,162)
Ending Balance	**2,019,000**	**1,733,162**	**2,192,000**
Debt Service Reserve			
Beginning Balance	1,000,000	1,000,000	1,000,000
Service Payments	1,300,000	1,411,988	1,190,000
Debt Service	(650,000)	(650,000)	(650,000)
Transfer to Capital Reserve	(650,000)	(761,988)	(540,000)
Ending Balance	**1,000,000**	**1,000,000**	**1,000,000**
Capital Reserve			
Beginning Balance	7,909,925	7,179,496	7,943,576
Grants	-	-	167,000
Transfer In	2,306,500	2,534,369	2,177,162
Capital	(1,915,000)	(1,770,289)	(2,067,000)
Ending Balance	**8,301,425**	**7,943,576**	**8,220,738**
Total Reserve Balance	**$ 11,320,425**	**$ 10,676,738**	**$ 11,412,738**

1. Operating Reserve Balance is equal to 50% of the next fiscal years Operating Budget
2. Debt Reserve Balance is set to equal $1,000,000 every fiscal year
3. Capital Reserve Balance is the projected remaining cash after the Operating and Debt Reserve requirments have been met

EAST BAY REGIONAL COMMUNICATIONS SYSTEM AUTHORITY

10 YEAR CASH FLOW PROJECTION

	FY 2018-19 Actual	FY 2019-20 Budget	FY 2020-21 Forecast	FY 2021-22 Forecast	FY 2022-23 Forecast	FY 2023-24 Forecast	FY 2024-25 Forecast	FY 2025-26 Forecast	FY 2026-27 Forecast	FY 2027-28 Forecast	FY 2028-29 Forecast
Operating Reserve											
Balance - beginning	$ 1,799,648	$ 1,733,162	$ 2,192,000	$ 2,215,500	$ 2,186,215	$ 2,238,522	$ 2,305,678	$ 2,374,848	$ 2,446,094	$ 2,519,477	$ 2,595,061
Receipts from members	5,172,218	6,480,000	6,638,000	6,655,400	6,655,400	6,655,400	6,655,400	6,655,400	6,655,400	6,655,400	6,655,400
Payments to suppliers	(3,466,323)	(4,384,000)	(4,431,000)	(4,372,430)	(4,477,044)	(4,611,356)	(4,749,696)	(4,892,187)	(5,038,954)	(5,190,122)	(5,345,826)
Transfer to Capital Reserve	(1,772,381)	(1,637,162)	(2,183,500)	(2,312,255)	(2,126,049)	(1,976,888)	(1,836,534)	(1,691,968)	(1,543,063)	(1,389,694)	(1,231,722)
Balance - ending	**1,733,162**	**2,192,000**	**2,215,500**	**2,186,215**	**2,238,522**	**2,305,678**	**2,374,848**	**2,446,094**	**2,519,477**	**2,595,061**	**2,672,913**
Debt Service Reserve											
Balance - beginning	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	-	-
Service payment	1,411,988	1,190,000	1,232,000	1,222,248	1,222,248	1,222,248	1,222,248	1,222,248	1,222,248	-	-
Principal	(454,000)	(473,000)	(492,000)	(512,000)	(532,000)	(553,000)	(576,000)	(600,000)	(623,000)	-	-
Bond interest	(196,000)	(177,000)	(158,000)	(138,000)	(118,000)	(97,000)	(74,000)	(50,000)	(27,000)	-	-
Transfer to Capital Reserve	(761,988)	(540,000)	(582,000)	(572,248)	(572,248)	(572,248)	(572,248)	(572,248)	(1,572,248)	-	-
Balance - ending	**1,000,000**	**1,000,000**	**1,000,000**	**1,000,000**	**1,000,000**	**1,000,000**	**1,000,000**	**1,000,000**	**-**	**-**	**-**
Capital Reserve											
Balance - beginning	7,179,496	7,943,576	8,220,738	8,919,238	9,888,741	10,672,038	11,306,174	13,464,956	15,479,172	18,344,482	19,484,176
Grants	-	167,000	-	-	-	-	-	-	-	-	-
Transfer In	2,534,369	2,177,162	2,765,500	2,884,503	2,698,297	2,549,136	2,408,782	2,264,216	3,115,311	1,389,694	1,231,722
Capital	(1,770,289)	(2,067,000)	(2,067,000)	(1,915,000)	(1,915,000)	(1,915,000)	(250,000)	(250,000)	(250,000)	(250,000)	(250,000)
Balance - ending	**7,943,576**	**8,220,738**	**8,919,238**	**9,888,741**	**10,672,038**	**11,306,174**	**13,464,956**	**15,479,172**	**18,344,482**	**19,484,176**	**20,465,898**
TOTAL RESERVE BALANCE	**$ 10,676,738**	**$ 11,412,738**	**$ 12,134,738**	**$ 13,074,956**	**$ 13,910,560**	**$ 14,611,852**	**$ 16,839,804**	**$ 18,925,265**	**$ 20,863,959**	**$ 22,079,237**	**$ 23,138,811**
SUPPLEMENTARY SCHEDULE FOR PAYMENTS TO SUPPLIERS											
Administration	$ (234,499)	$ (414,000)	$ (414,000)	$ (288,400)	$ (297,052)	$ (305,964)	$ (315,143)	$ (324,597)	$ (334,335)	$ (344,365)	$ (354,696)
Audit fees	(2,260)	(20,000)	(20,000)	(20,600)	(21,218)	(21,855)	(22,511)	(23,186)	(23,882)	(24,598)	(25,336)
Insurance	(23,559)	(30,000)	(40,000)	(41,200)	(42,436)	(43,709)	(45,020)	(46,371)	(47,762)	(49,195)	(50,671)
Lease	(30,675)	(70,000)	(70,000)	(72,100)	(74,263)	(76,491)	(78,786)	(81,150)	(83,585)	(86,093)	(88,676)
Legal	(4,509)	(20,000)	(20,000)	(20,600)	(21,218)	(21,855)	(22,511)	(23,186)	(23,882)	(24,598)	(25,336)
Licenses and permits	(4,855)	(30,000)	(30,000)	(30,900)	(31,827)	(32,782)	(33,765)	(34,778)	(35,821)	(36,896)	(38,003)
Membership fees	(8,377)	(10,000)	(10,000)	(10,300)	(10,609)	(10,927)	(11,255)	(11,593)	(11,941)	(12,299)	(12,668)
Maintenance											
Customer svc. agmt.	(1,015,914)	(1,065,000)	(1,080,000)	(1,088,000)	(1,099,000)	(1,131,970)	(1,165,929)	(1,200,907)	(1,236,934)	(1,274,042)	(1,312,263)
SUA II	(938,445)	(962,000)	(974,000)	(980,000)	(1,009,400)	(1,039,682)	(1,070,872)	(1,102,998)	(1,136,088)	(1,170,171)	(1,205,276)
System management	(248,257)	(260,000)	(262,000)	(264,000)	(267,000)	(275,010)	(283,260)	(291,758)	(300,511)	(309,526)	(318,812)
HVAC	(20,194)	(23,000)	(20,000)	(20,600)	(21,218)	(21,855)	(22,511)	(23,186)	(23,882)	(24,598)	(25,336)
Generators	(36,315)	(57,000)	(40,000)	(41,200)	(42,436)	(43,709)	(45,020)	(46,371)	(47,762)	(49,195)	(50,671)
ALCO maintenance	(490,000)	(600,000)	(600,000)	(618,000)	(636,540)	(655,636)	(675,305)	(695,564)	(716,431)	(737,924)	(760,062)
COCO maintenance	(128,892)	(230,000)	(230,000)	(236,900)	(244,007)	(251,327)	(258,867)	(266,633)	(274,632)	(282,871)	(291,357)
CSI telecommunications	(60,200)	(200,000)	(200,000)	(206,000)	(212,180)	(218,545)	(225,101)	(231,854)	(238,810)	(245,974)	(253,353)
Microwave maintenance	(78,672)	(196,000)	(180,000)	(185,400)	(190,962)	(196,691)	(202,592)	(208,670)	(214,930)	(221,378)	(228,019)
Miscellaneous	(1,316)	(10,000)	(15,000)	(15,450)	(15,914)	(16,391)	(16,883)	(17,389)	(17,911)	(18,448)	(19,001)
Security	(10,198)	(11,000)	(12,000)	(12,360)	(12,731)	(13,113)	(13,506)	(13,911)	(14,328)	(14,758)	(15,201)
Utilities	(125,786)	(172,000)	(210,000)	(216,300)	(222,789)	(229,473)	(236,357)	(243,448)	(250,751)	(258,274)	(266,022)
Web site hosting	(3,400)	(4,000)	(4,000)	(4,120)	(4,244)	(4,371)	(4,502)	(4,637)	(4,776)	(4,919)	(5,067)
Payments to suppliers	**$ (3,466,323)**	**$ (4,384,000)**	**$ (4,431,000)**	**$ (4,372,430)**	**$ (4,477,044)**	**$ (4,611,356)**	**$ (4,749,696)**	**$ (4,892,187)**	**$ (5,038,954)**	**$ (5,190,122)**	**$ (5,345,826)**

East Bay Regional Communications System Authority

Participating agencies include Alameda and Contra Costa Counties and the following cities and special districts: Alameda, Albany, Antioch, Berkeley, Brentwood, Clayton, Concord, Danville, Dublin, El Cerrito, Emeryville, Fremont, Hayward, Hercules, Lafayette, Livermore, Martinez, Moraga, Newark, Oakley, Pinole, Pittsburg, Pleasant Hill, Pleasanton, Richmond, San Leandro, San Pablo, San Ramon, Union City, Walnut Creek, East Bay Regional Park District, Kensington Police Community Services District, Livermore Amador Valley Transit Authority, Moraga-Orinda Fire District, Rodeo-Hercules Fire District, San Ramon Valley Fire District, California Department of Transportation, Ohlone Community College District, Contra Costa Community College District, Dublin-San Ramon Services District and University of California, Berkeley

AGENDA ITEM 4B

STAFF REPORT
OPERATIONS COMMITTEE
MEETING SEPTEMBER 4, 2020

SUMMARY:

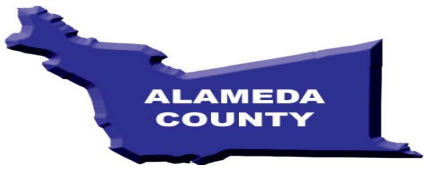
Adjust the fiscal year 2020-21 budget to account for utilities provided at various Alameda County radio sites.

Below is a summary of the proposed budget adjustments for FY2020-21:

REVENUES	
Operating Payments	$ 50,000
Total	50,000
EXPENSES	
Utilities	50,000
Total	$ 50,000

RECOMMENDED ACTION:

Staff recommends that the Committee approve the budget adjustment for fiscal year 2020-21.



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BUDGET

FISCAL YEAR 2020-21

Revenues	
Operating payments	$ 6,450,000
Service payments	1,232,000
Interest	188,000
Total revenues	**7,870,000**
Expenses	
Administration	414,000
Audit fees	20,000
Insurance	40,000
Lease	70,000
Legal	20,000
Licenses and permits	30,000
Membership fees	10,000
Maintenance	3,601,000
Security	12,000
Utilities	210,000
Website hosting	4,000
Total operating expenses	**4,431,000**
Capital	2,067,000
Debt Service	650,000
Total expenses	**7,148,000**
Net Income	**$ 722,000**

EAST BAY REGIONAL COMMUNICATIONS SYSTEM
EXPENDITURE DETAIL
FISCAL YEAR 2020-2021

OPERATING EXPENSES	FY20-21 Approved	FY20-21 Amendment #1	FY20-21 Amended
Administration			
Executive director	$ 225,000	$ -	$ 225,000
Administrative assistant	40,000	-	40,000
Planning	134,000	-	134,000
Travel	5,000	-	5,000
Miscellaneous	10,000	-	10,000
Audit fees	20,000	-	20,000
Insurance	40,000	-	40,000
Lease	70,000	-	70,000
Legal	20,000	-	20,000
Licenses and permits	30,000	-	30,000
Membership fees	10,000	-	10,000
Maintenance		-	-
Service agreement	1,080,000	-	1,080,000
Software maintenance (SUA II)	974,000	-	974,000
Network administration	262,000	-	262,000
HVAC maintenance	20,000	-	20,000
Generator maintenance	40,000	-	40,000
ALCO general maintenance	600,000	-	600,000
COCO general maintenance	230,000	-	230,000
CSI telecommunications	200,000	-	200,000
Microwave maintenance	180,000	-	180,000
Miscellaneous	15,000	-	15,000
Security	12,000	-	12,000
Utilities	160,000	50,000	210,000
Website hosting	4,000	-	4,000
Total expenses	**4,381,000**	**50,000**	**4,431,000**
CAPITAL EXPENDITURES			
TDMA Upgrade	1,665,000	-	1,665,000
DC Power Upgrade	250,000	-	250,000
Dispatch Consoles	152,000	-	152,000
Total expenditures	**2,067,000**	**-**	**2,067,000**
DEBT SERVICE			
Principal	492,000	-	492,000
Interest	158,000	-	158,000
Total expenses	**$ 650,000**	**$ -**	**$ 650,000**

1. Motorola service agreement increased due to a new 4 year contract
2. Network administration contract increased
3. TDMA Upgrade Expense is the annual payment for the Change Order approved by the Board of Directors
4. DC Power Updgrade Expense is an annual amount to replace the batteries in various locations

EAST BAY REGIONAL COMMUNICATIONS SYSTEM
PROJECTED CASH RESERVE BALANCES
FISCAL YEAR 2020-2021

	FY19-20 Final Budget	FY19-20 Projected	FY20-21 Budget
Operating Reserve			
Beginning Balance	$ 1,733,162	$ 1,733,162	$ 1,994,000
Operating Payments	6,400,000	7,638,000	6,450,000
Initial Payments	-	5,000	-
Interest	80,000	201,000	188,000
Operating Expenses	(4,384,000)	(3,988,000)	(4,431,000)
Transfer to Capital Reserve	(1,637,162)	(3,595,162)	(1,985,500)
Ending Balance	**2,192,000**	**1,994,000**	**2,215,500**
Debt Service Reserve			
Beginning Balance	1,000,000	1,000,000	1,000,000
Service Payments	1,190,000	1,124,000	1,232,000
Debt Service	(650,000)	(650,000)	(650,000)
Transfer to Capital Reserve	(540,000)	(474,000)	(582,000)
Ending Balance	**1,000,000**	**1,000,000**	**1,000,000**
Capital Reserve			
Beginning Balance	7,943,576	7,943,576	10,264,738
Grants	167,000	167,000	-
Transfer In	2,177,162	4,069,162	2,567,500
Capital	(2,067,000)	(1,915,000)	(2,067,000)
Ending Balance	**8,220,738**	**10,264,738**	**10,765,238**
Total Reserve Balance	**$ 11,412,738**	**$ 13,258,738**	**$ 13,980,738**

1. Operating Reserve Balance is equal to 50% of the next fiscal years Operating Budget
2. Debt Reserve Balance is set to equal $1,000,000 every fiscal year
3. Capital Reserve Balance is the projected remaining cash after the Operating and Debt Reserve requirments have been met

EAST BAY REGIONAL COMMUNICATIONS SYSTEM AUTHORITY

10 YEAR CASH FLOW PROJECTION

Operating Reserve	FY 2019-20 Projected	FY 2020-21 Budget	FY 2021-22 Forecast	FY 2022-23 Forecast	FY 2023-24 Forecast	FY 2024-25 Forecast	FY 2025-26 Forecast	FY 2026-27 Forecast	FY 2027-28 Forecast	FY 2028-29 Forecast	FY 2029-30 Forecast
Balance - beginning	$ 1,733,162	$ 1,994,000	$ 2,215,500	$ 2,186,215	$ 2,238,522	$ 2,305,678	$ 2,374,848	$ 2,446,094	$ 2,519,477	$ 2,595,061	$ 2,672,913
Receipts from members	7,844,000	6,638,000	6,655,400	6,655,400	6,655,400	6,655,400	6,655,400	6,655,400	6,655,400	6,655,400	6,655,400
Payments to suppliers	(3,988,000)	(4,431,000)	(4,372,430)	(4,477,044)	(4,611,356)	(4,749,696)	(4,892,187)	(5,038,954)	(5,190,122)	(5,345,826)	(5,506,201)
Transfer to Capital Reserve	(3,595,162)	(1,985,500)	(2,312,255)	(2,126,049)	(1,976,888)	(1,836,534)	(1,691,968)	(1,543,063)	(1,389,694)	(1,231,722)	(1,069,012)
Balance - ending	**1,994,000**	**2,215,500**	**2,186,215**	**2,238,522**	**2,305,678**	**2,374,848**	**2,446,094**	**2,519,477**	**2,595,061**	**2,672,913**	**2,753,101**
Debt Service Reserve											
Balance - beginning	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	-	-	-
Service payment	1,124,000	1,232,000	1,222,248	1,222,248	1,222,248	1,222,248	1,222,248	1,222,248	-	-	-
Principal	(473,000)	(492,000)	(512,000)	(532,000)	(553,000)	(576,000)	(600,000)	(623,000)	-	-	-
Bond interest	(177,000)	(158,000)	(138,000)	(118,000)	(97,000)	(74,000)	(50,000)	(27,000)	-	-	-
Transfer to Capital Reserve	(474,000)	(582,000)	(572,248)	(572,248)	(572,248)	(572,248)	(572,248)	(1,572,248)	-	-	-
Balance - ending	**1,000,000**	**1,000,000**	**1,000,000**	**1,000,000**	**1,000,000**	**1,000,000**	**1,000,000**	**-**	**-**	**-**	**-**
Capital Reserve											
Balance - beginning	7,943,576	10,264,738	10,765,238	11,734,741	12,518,038	13,152,174	15,310,956	17,325,172	20,190,482	21,330,176	22,311,898
Grants	167,000	-	-	-	-	-	-	-	-	-	-
Transfer In	4,069,162	2,567,500	2,884,503	2,698,297	2,549,136	2,408,782	2,264,216	3,115,311	1,389,694	1,231,722	1,069,012
Capital	(1,915,000)	(2,067,000)	(1,915,000)	(1,915,000)	(1,915,000)	(250,000)	(250,000)	(250,000)	(250,000)	(250,000)	(250,000)
Balance - ending	**10,264,738**	**10,765,238**	**11,734,741**	**12,518,038**	**13,152,174**	**15,310,956**	**17,325,172**	**20,190,482**	**21,330,176**	**22,311,898**	**23,130,910**
TOTAL RESERVE BALANCE	**$ 13,258,738**	**$ 13,980,738**	**$ 14,920,956**	**$ 15,756,560**	**$ 16,457,852**	**$ 18,685,804**	**$ 20,771,265**	**$ 22,709,959**	**$ 23,925,237**	**$ 24,984,811**	**$ 25,884,010**
SUPPLEMENTARY SCHEDULE FOR PAYMENTS TO SUPPLIERS											
Administration	$ (237,600)	$ (414,000)	$ (288,400)	$ (297,052)	$ (305,964)	$ (315,143)	$ (324,597)	$ (334,335)	$ (344,365)	$ (354,696)	$ (365,337)
Audit fees	(11,000)	(20,000)	(20,600)	(21,218)	(21,855)	(22,511)	(23,186)	(23,882)	(24,598)	(25,336)	(26,096)
Insurance	(26,000)	(40,000)	(41,200)	(42,436)	(43,709)	(45,020)	(46,371)	(47,762)	(49,195)	(50,671)	(52,191)
Lease	(68,000)	(70,000)	(72,100)	(74,263)	(76,491)	(78,786)	(81,150)	(83,585)	(86,093)	(88,676)	(91,336)
Legal	(9,000)	(20,000)	(20,600)	(21,218)	(21,855)	(22,511)	(23,186)	(23,882)	(24,598)	(25,336)	(26,096)
Licenses and permits	-	(30,000)	(30,900)	(31,827)	(32,782)	(33,765)	(34,778)	(35,821)	(36,896)	(38,003)	(39,143)
Membership fees	(7,000)	(10,000)	(10,300)	(10,609)	(10,927)	(11,255)	(11,593)	(11,941)	(12,299)	(12,668)	(13,048)
Maintenance											
Customer svc. agmt.	(1,064,000)	(1,080,000)	(1,088,000)	(1,099,000)	(1,131,970)	(1,165,929)	(1,200,907)	(1,236,934)	(1,274,042)	(1,312,263)	(1,351,631)
SUA II	(958,000)	(974,000)	(980,000)	(1,009,400)	(1,039,682)	(1,070,872)	(1,102,998)	(1,136,088)	(1,170,171)	(1,205,276)	(1,241,434)
System management	(258,000)	(262,000)	(264,000)	(267,000)	(275,010)	(283,260)	(291,758)	(300,511)	(309,526)	(318,812)	(328,376)
HVAC	(20,000)	(20,000)	(20,600)	(21,218)	(21,855)	(22,511)	(23,186)	(23,882)	(24,598)	(25,336)	(26,096)
Generators	(43,000)	(40,000)	(41,200)	(42,436)	(43,709)	(45,020)	(46,371)	(47,762)	(49,195)	(50,671)	(52,191)
ALCO maintenance	(600,000)	(600,000)	(618,000)	(636,540)	(655,636)	(675,305)	(695,564)	(716,431)	(737,924)	(760,062)	(782,864)
COCO maintenance	(221,000)	(230,000)	(236,900)	(244,007)	(251,327)	(258,867)	(266,633)	(274,632)	(282,871)	(291,357)	(300,098)
CSI telecommunications	(80,000)	(200,000)	(206,000)	(212,180)	(218,545)	(225,101)	(231,854)	(238,810)	(245,974)	(253,353)	(260,954)
Microwave maintenance	(195,000)	(180,000)	(185,400)	(190,962)	(196,691)	(202,592)	(208,670)	(214,930)	(221,378)	(228,019)	(234,860)
Miscellaneous	(10,300)	(15,000)	(15,450)	(15,914)	(16,391)	(16,883)	(17,389)	(17,911)	(18,448)	(19,001)	(19,571)
Security	(10,700)	(12,000)	(12,360)	(12,731)	(13,113)	(13,506)	(13,911)	(14,328)	(14,758)	(15,201)	(15,657)
Utilities	(166,000)	(210,000)	(216,300)	(222,789)	(229,473)	(236,357)	(243,448)	(250,751)	(258,274)	(266,022)	(274,003)
Web site hosting	(3,400)	(4,000)	(4,120)	(4,244)	(4,371)	(4,502)	(4,637)	(4,776)	(4,919)	(5,067)	(5,219)
Payments to suppliers	**$ (3,988,000)**	**$ (4,431,000)**	**$ (4,372,430)**	**$ (4,477,044)**	**$ (4,611,356)**	**$ (4,749,696)**	**$ (4,892,187)**	**$ (5,038,954)**	**$ (5,190,122)**	**$ (5,345,826)**	**$ (5,506,201)**

East Bay Regional Communications System Authority

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AGENDA ITEM NO. 5.

AGENDA STATEMENT
OPERATIONS COMMITTEE
MEETING DATE: November 6, 2020

TO: Operations Committee
East Bay Regional Communications System Authority (EBRCSA)

FROM: Tom McCarthy, Executive Director
East Bay Regional Communications System Authority

SUBJECT: Request Direction regarding Upgrade of the East Bay Regional Communications System Authority Microwave Network, Multi-Protocol Label Switching, and Network Transition from TI Circuits to Ethernet.

RECOMMENDATIONS:

Request Committee discuss and make a recommendation to the Board of Directors regarding upgrade of the East Bay Regional Communications System Authority (EBRCSA) Microwave Communications Network Upgrade, Multi-Protocol Label Switching (MPLS), and Network Transition from T1 Circuits to Ethernet.

SUMMARY/DISCUSSION:

Public Safety Networks are transitioning from Land Mobile Radio (LMR) to digital IP systems. EBRCSA is currently a LMR radio system and along with other LMR systems in the area must transition to digital IP. The upgrade is necessary to transmit voice data through the new IP (internet protocol) framework and standards which are replacing the traditional LMR. The digital IP provides a new connection from the Master Site to networks and services for the future change in technology which state and local governments are transitioning to MPLS (Multi-Protocol Label Switching). MPLS provides a single method of transporting multiple technologies and protocols over a single medium. MPLS ensures the delivery of priority communications by supporting multiple transport technologies that provide improved network security and mission critical reliability utilizing fiber and microwave.

The EBRCSA LMR system needs to transition from a LMR legacy system to a digital IP framework and standard so that it can manage the data and voice transmissions. The EBRCSA Master Site is currently supported by Motorola through our Service Update Agreement (SUA) through 2022. Motorola has advised - they need EBRCSA to adopt the MPLS and Ethernet format due to changes in technology that require EBRCSA to change in order to ensure that the system continues to perform at an optimum level. New components and software are being created in the MPLS and Ethernet format. The next SUA between Motorola and EBRCSA will require that EBRCSA be equipped with Ethernet and MPLS. There is not a set date for the next SUA upgrade, and the last upgrade was performed in February 2020. The updates are completed every two years.

EBRCSA was built utilizing existing Microwave communications that were provided by the member agencies and a Microwave purchase in 2004 via the Super Urban Area Security Imitative Grant. The system operates well, however, the age of the equipment in some cases is 20 years old and the remaining life expectancy of some of the equipment is approximately 5 years.

The project will replace all the EBRCSA existing Truepoint SONET systems with the new Eclipse TDM/IP Hybrid network and maintain the T-1 loop protections. The upgrade will also increase the capacity 10 GHz to 11 GHz. The Radio Technicians and the Executive Director recently attended a meeting with Aviat and discussed the need to begin replacement of the Microwave equipment. CSI, EBRCSA's consulting engineer, has met with the Executive Director and confirmed the need to transition to the Ethernet/MPLS system.

EBRCSA has discussed options utilizing Motorola Inc. and Aviat, both currently support the EBRCSA system and can manage the whole project or a part of the project. The first option is to utilize Motorola Inc. as a prime contractor and Aviat as a subcontractor. The second option would be to use Aviat, and EBRCSA would be the oversite of the project utilizing Aviat, Motorola, and CSI.

The transition to Ethernet and MPLS requires that the upgrades and changes be performed on an operating system which cannot be taken offline during the transition.

EBRCSA being the prime, requires a knowledge of the project and is working to schedule the subcontractors so that there is no service interruption.

FISCAL IMPACT:

The Operations Committee made a recommendation at the September 6, 2020, meeting to award the Contract to Motorola Solutions Inc. The Finance Committee formulated a subcommittee to review the proposals from Motorola Solutions Inc. and Aviat. The Finance Committee recommended Motorola Solutions Inc. and to combine the current TDMA project with the Ethernet/MPLS project. The combined TDMA and Ethernet/MPLS project will have a Principal of $11,817,950.00 at an interest rate of 1.77%. The lease to own would be from 12/1/2021 to 12/1/2027. It is recommended that the Finance Committee make a recommendation to combine the TDMA and Ethernet/MPLS and finance through Motorola Solutions Inc.

A spread sheet provided by Board Member Calabrigo is attached to outline the recommendation highlighted in green.

RECOMMENDED ACTION:

It is recommended that the Committee provide its recommendation to the Board of Directors as to award the contract to Motorola Solutions Inc. to combine the TDMA contract with the Ethernet/MPLS Contract. The combined TDMA and Ethernet/MPLS project will have a Principal of $11,817,959.00 at an interest rate of 1.77%. The lease to own would be from 12/1/21 to 12/1/2027. EBRCSA will then begin the transition to Ethernet/MPLS.

Attachments:

"A" – EBRCSA Microwave Upgrade and MPLS Implementation
"B" – Motorola Equipment Lease Purchase Ethernet/MPLS/TDMA
"C" – Aviat Ten – Year Microwave Upgrade Agreement Release 3.1
"D" – Subcommittee Worksheet

MOTOROLA SOLUTIONS

EAST BAY REGIONAL COMMUNICATIONS SYSTEM AUTHORITY

EBRCS MICROWAVE UPGRADE AND MPLS IMPLEMENTATION **11/2/2019**

TABLE OF CONTENTS

Motorola Solutions, Inc.
1303 E. Algonquin Rd.
Schaumburg, IL 60196
USA

Tel. + 1 847 576 5000
Fax + 1 847 538 6020

11/2/2019

Mr. Tom McCarthy,
Executive Director
East Bay Regional Communications System Authority
4985 Broder Blvd.
Dublin, California 94568

Subject: EBRCS Microwave Upgrade and MPLS Implementation

Dear Director McCarthy,

Motorola Solutions, Inc. (“Motorola”) is pleased to provide the East Bay Regional Communications System Authority (“EBRCSA”) the following Proposal to upgrade the 13 year old backhaul communications network. Motorola is honored and humbled by the shared trust EBRCSA continues to have in our partnership.

The backhaul network is an indispensible component of your overall public safety radio communications. We understand why EBRCSA may be less than eager to undertake this long anticipated and challenging upgrade. As a result, Motorola has taken great care to propose a solution that ensures you achive the critical network resiliancy and security advancements in the most economically and financiallly sound manner.

The solution we are proposing to upgrade your backhaul network includes:

- Microwave Communications Network Upgrade
- Multi-Protocol Label Switching (MPLS) Addition
- Network Transition from T1 circuits to Ethernet

Continuity of EBRCSA's network operations are paramount. Towards that end, Motorola has developed a measured, multi-year deployment plan to upgrade the existing backhaul network and transition to Ethernet. To help fit the backhaul upgrade within EBRCSA budget, Motorola is proposing the cost-effective lease-purchase program EBRCSA used to finance the TDMA upgade in 2017.

This Proposal is a firm offer, subject to the terms and conditions of the existing Communications System Agreement (CSA) between EBRCSA and Motorola, dated July 07, 2009, extended on July 6, 2012, and extended again on July 6, 2017 through July 6, 2020. Under Section 3.4 of the existing contract, EBRCSA may purchase additional goods and services from the CSA. Motorola’s proposal is based on the assumption that EBRCSA will use this right under Section 3.4 of the CSA for the proposed transaction. Therefore, as in the past, EBRCSA may accept the proposal by executing a Change Order to the current CSA.

Any questions EBRCSA has regarding this proposal can be directed to Gordon Poole, Senior Account Manager at (408) 306-5622, (gordon.poole@motorolasolutions.com).

We thank you for the continued privilage of furnishing EBRCSA with “best in class” solutions that help protect your first responders and assist their efforts saving lives and property.

Sincerely,

Motorola Solutions, Inc.

Micah Applewhite
Territory Vice President

SECTION 1

SOLUTION DESCRIPTION

1.1 SOLUTION OVERVIEW

Motorola is pleased to provide a proposal to EBRCSA to upgrade their existing Backhaul Network with the following components:

- **Microwave Backhaul Upgrade** – Motorola has partnered with Aviat to upgrade the existing TruePoint microwave radios to the latest ECLIPSE microwave radio and several microwave paths will be upgraded from 10 GHz to 11 GHz.
- **MPLS Addition** – Motorola has partnered with Nokia to include addition of MPLS routers in the EBRCS Backhaul Network and on that facilitate the transition to Ethernet based network.
- **Backhaul transition from T1 to Ethernet** – Concurrently with the MW upgrade and MPLS additions projects, Motorola will transition the system from current T1 connectivity to Ethernet based connectivity.

In order to facilitate EBRCSA to budget for these upgrade projects, Motorola has designed a special lease-purchase program. This would be the most cost effective, economical way for EBRCSA to finance, because the interest payments from the government entity are exempt from Motorola's federal income tax liability. Motorola shares this benefit by offering exceptionally low interest rates to EBRCSA.

Considering the importance of EBRCSA's network operations continuity, Motorola has developed a multi-year deployment plan to upgrade the existing backhaul network and transition to Ethernet. The goal is to help EBRCSA to avoid the performance challenges of large scale network changes by taking smaller, controlled steps.

1.2 MICROWAVE BACKHAUL UPGRADE

Motorola has partnered with Aviat to design, supply and implement the Microwave Backhaul Upgrade project. The scope of this proposal is to implement the replacement of the EBRCS existing Truepoint SONET system with new Eclipse TDM/IP Hybrid network while maintaining the T1 loop protection. Also, several microwave paths will be upgraded from 10 GHz to 11 GHz with the capacity increased from 24Mbps to 45Mbps.

1.2.1 Current Backhaul Overview

The existing system consists of three OC-3 loops and total of 50 links

- Alameda County (ALCO) loop – contains 31 links
- Contra Costa County (CCCO) loop – contains 12 links
- Richmond mini-loop – contains 7 links

There are 3 parallel paths between the ALCO loop and CCCO loop. Each loop has its own links.

- BALD MTN (BALD PEAK) – ROCKY RIDGE
- ROCKY RIDGE – ALAMEDA EOC
- ALAMEDA EOC – SANTA RITA JAIL PASSIVE REPEATER

Alameda County loop also has the link Sunol Ridge – Carol Drive contains 4-radio channels.

1.2.2 Microwave Backhaul Upgrade Components

1.2.2.1 Backhaul Design

All paths in the system, including rings and spurs, are designed in Pathloss using the Vigants-Barnett model and the Crane Rain Model. All paths in the system shall meet the following requirements.

- 2-way Link Availability Required Ring and Backbone: 99.9999% with link bandwidth is 180 Mbps
- 2-way Link Availability Required Spurs: 99.9999% with link bandwidth is 45Mbps
- The radios in loops are nonprotected, operated on L6, U6 or 11GHz and on the modulation 30MHz 256QAM 180Mbps
- The radios on spurs are protected, operated on U6 or 11GHz and on the modulation 10MHz 64QAM 45Mbps
- 9 paths in spurs are currently in 10GHz band using 10GHz antennas (Radio Waves) which support the range from 10.15 – 10.7 GHz. These links will need to be replaced with 11 GHz with the capacity increased from 24Mbps to 45Mbps. The existing antenna system will also need to be replaced with 11 GHz antenna system.
    1. BALD MTN (BALD PEAK) – SKYLINE (SPUR)
    2. LAKESIDE – OAKLAND PD (SPUR)
    3. LAKESIDE – PIEDMONT PD (SPUR)
    4. OAKLAND APL – BERKELEY PD (SPUR)
    5. SUNOL RIDGE – WARM SPRING (SPUR)
    6. DOOLAN WT – PATTERSON PS (SPUR)
    7. KREGOR PEAK – CONCORD PD (SPUR)
    8. PINE STREET - MARTINEZ (SPUR)
    9. WALNUT CREEK BART – WALNUT CREEK PD (SPUR)
- Some of links will need to use High Power (HP) or Extra High Power (EHP) radios in order to achieve 99.9999% reliability

1.2.2.2 Antennas and Transmission Lines

- Reuse existing antennas at most of the sites.
- It is assumed that the existing antennas, centerlines and waveguide lines can be reused for all existing 6/11 GHz RFU indoor hops. Reuse existing feedthroughs.
- For all ODU600 (outdoor RFU) will be outdoor remote-mounted to antenna and new 3ft Flextwist and new coaxial cables are proposed to replace existing coaxial cables. Assuming there is an existing conduit and passage for the Coax cable.
- 6 radios will need new Flextwist and Coax transmission lines for outdoor ODU600v2
    1. LAKESIDE (to Bald Peak)
    2. LAKESIDE (to Lawrence Berkeley Lab)
    3. OAKLAND APL (to Lawrence Berkeley Lab)
    4. OAKLAND APL (to Glen Dyer Jail)
    5. OAKLAND APL (to Emeryville FD)
    6. ANTIOCH PD (to Kregor Peak)
- 17 radios need new antennas and new Flextwist and transmission lines for ODU600v2 or IRU600v4
    1. LAKESIDE (to Oakland PD) needs for ODU600v2
    2. LAKESIDE (to Piedmont PD) needs for ODU600v2
    3. OAKLADN APL (to Berkeley PD) needs for ODU600v2
    4. MARTINEZ (to Pine Street) needs for ODU600v2
    5. CONCORD PD (to Kregor Peak) needs for ODU600v2
    6. WALNUT CREEK PD (to Walnut Creek Bart) needs for ODU600v2
    7. BALD MTN (to Skyline) needs for IRU600v4
    8. OAKLAND PD (to Lakeside) needs for IRU600v4
    9. PIEDMONT PD (to Lakeside) needs for IRU600v4
    10. BERKELEY PD (to Oakland APL) needs for IRU600v4
    11. SUNOL RIDGE (to Warm Spring) needs for IRU600v4
    12. WARM SPRING (to Sunol Ridge) needs for IRU600v4
    13. DOOLAN WT (to Patterson PS) needs for IRU600v4
    14. PATTERSON PS (to Doolan WT) needs for IRU600v4
    15. KREGOR PEAK (to Concord PD) needs for IRU600v4
    16. PINE STREET (to Martinez) needs for IRU600v4
    17. WALNUT CREEK BART (to Walnut Creek PD) needs for IRU600v4
- The plan is subject to change according to the site surveys.

1.2.2.3 Microwave Radios

- Most existing TruePoint radios will be replaced with IRU600v4 and INUe,
- 6 sites are required to have outdoor radio ODU600v2 and INUe, on U6 or 11GHz
    1. OAKLAND APL
    2. LAKESIDE
    3. ANTIOCH PD
    4. CONCORD PD
    5. MARTINEZ
    6. WALNUT CREEK PD
- 12 links have two radio types; one end is outdoor ODU600v2 and the other end is indoor IRU600v4.
    1. OAKLAND APL – LAWRENCE BERKELEY LAB
    2. OAKLAND APL – GLEN DYER JAIL
    3. LAKESIDE - LAWRENCE BERKELEY LAB
    4. LAKESIDE – BALD PEAK
    5. OAKLAND APL – BERKELEY PD (SPUR)
    6. OAKLAND APL – EMERYVILE PD (SPUR)
    7. LAKESIDE – PIEDMONT PD (SPUR)
    8. LAKESIDE – OAKLAND PD (SPUR)
    9. ANTIOCH PD – KREGOR PEAK (SPUR)
    10. CONCORD PD – KREGOR PEAK (SPUR)
    11. MARTINEZ - PINE STREET (SPUR)
    12. WALNUT CREEK PD - WALNUT CREEK BART (SPUR)

1.2.2.4 Tributary Interface

- DS1 and Ethernet interface are equipped with radios at each site.
- DS1s in the loops will be loop-protected and terminated at DSX-1 jackfield.
- Ethernet in the loops will be loop-protected and routing by MPLS routers

1.2.2.5 T1 loop protection

All existing T1s on the SONET network will be migrated to new TDM/IP Hybrid network with NCM modules equipped with INUe shelves.

Motorola/Aviat propose protected Network Capabilities Module (NCM) with associated NCM software license that supports up to 63 T1 and T1 cables at each site in the ring to take care of T1 loop switching protection in place of existing SONET muxes.

The NCM provides E1/DS1 loop switch (ring protection) capability on an Eclipse Node. Each ring node that drops traffic must use an NCM to access two redundant traffic streams. TDM traffic is injected in both directions of the ring.

The NCM card has full access to the TDM backplane for working, protection, and drop connections as well as 8 drop interfaces on front of the card. If more than 8 T1 drops are needed, DAC16x to be used to take additional T1 drops. NCM will receive traffic from the backplane from both directions of the ring and select the best path.

Two NCMs are proposed in each INUe shelf to provide equipment protection.

1.2.2.6 Network Management

The new ProVision management system is proposed. All the new Eclipse radios as well as existing Eclipse radios and all SNMP devices will be monitored by the ProVision. The ProVision can be implemented in parallel with existing NMS NetBoss allowing customer to familiarize themselves with the new product.

1.2.2.7 Alarm Management

AUX cards and Alarm cables to existing M66 Blocks are proposed at each site.

1.2.2.8 Rack

One or two 7ft racks equipped with a breaker panel are proposed at each site to installed new equipment. Two 8ft racks are proposed at ALAMEDA EOC. Motorola will run DC cables from new rack to distribution panel. It is assumed 30 feet from DC distribution panel

1.2.2.9 Pressurization

Assuming customer would reuse their existing Dehydrator and manifold system and it would be able to support new equipment.

1.2.2.10 DC Power Plant

Assuming customer would reuse their existing DC Power Plant system and it would be able to support new equipment.

1.2.2.11 Demarcation

The demarcation point will be:

- For T1, it will be on new DS-1 circuits terminated on DSX-1 jackfield panel
- For Ethernet, it will be on Ethernet port on the DACGE3
- DS-1 traffic will not go through MPLS Routers. Routers will be a new overlay.

1.2.2.12 Traffic Plan

- **T1 traffic**: Customer would like to support all current T1s for now since the actual transition to Ethernet will likely occur until after the microwave radio upgrade. In the

assumptions that the T1 traffic plan is the same as what we have when we built the system for the proposal now. Current Traffic is Public Safety.

- **Ethernet Traffic**: MPLS network design is based on Layer 3 architecture. Motorola will set up pipe for QoS, latency, etc. Traffic plan would need to be put together, so Motorola will develop Layer 3 network design.

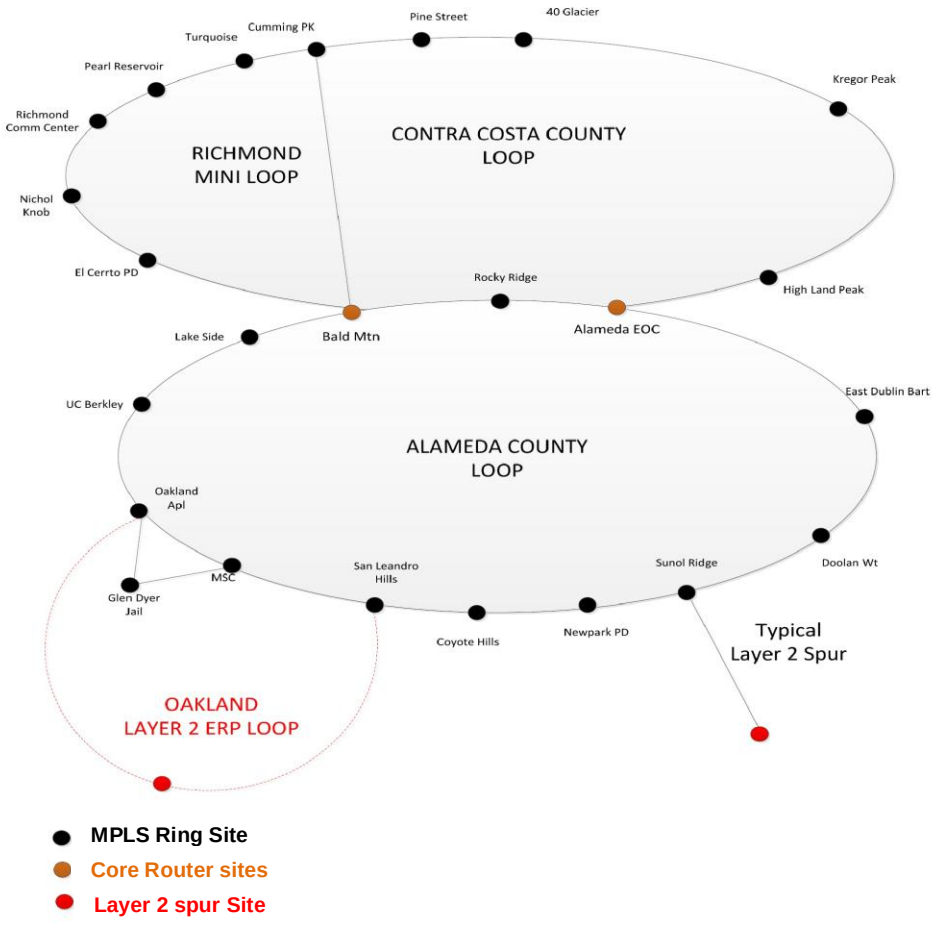
1.3 MPLS ADDITION

Motorola in partnership with Nokia is proposing MPLS solution based on the SAR platform.

The EBRCS MPLS network is divided into 3 OSPF loops so it becomes easy to implement and maintain the MPLS network. These three loops are:

- Alameda County Loop.
- Contra Cost County Loop
- Richmond Mini Loop

Each loop is connected to the core router to pass the traffic from on loop to the other.



1.3.1 MPLS Solution Components

Motorola has included a Nokia IP/MPLS transport system in the design that will reside on top of the microwave network to support all the routing and management of IP traffic throughout the simulcast RF subsite network. The MPLS transport system uses all COTS equipment designed for use with microwave in a public safety grade network. This design provides MPLS routers at all EBRCS sites except at two repeater sites and fifteen console dispatch locations which are configured as spurs in the EBRCS design. This approach allows Motorola to maintain the reliability and resiliency of the IP/MPLS design while reducing the need for additional hardware to support the migration to Ethernet.

Having the ability to accommodate multiple types of traffic is important as network applications converge to a data centric environment and rely on Ethernet and IP functionality. It's not always realistic to eliminate all of the existing TDM applications without a negative impact on services and operations. The MPLS designed network as proposed provides a smooth migration from traditional TDM to IP at the pace of each individual entity/user.

Motorola has designed a highly reliable IP/MPLS network solution that enables EBRCS to meet the performance requirements of all their mission-critical services and applications. The Nokia 7705 SAR platforms provided in this proposal will provide a highly reliable network platform from which Ethernet services will be delivered to end user applications. An IP/MPLS implementation offers advantages and savings such as:

- Optimizing the bandwidth available in the network to make possible the introduction of new applications.
- Reducing the dependency on leased lines.
- Extending services to remote areas.
- Satisfying the growing IT functions.
- Providing network virtualization with QoS guaranteed for priority traffic.
- Improving agency interoperability and access to critical information.

The Nokia 7705 Service Aggregation Router (SAR) delivers industry–leading IP/MPLS and pseudowire capabilities. Designed for scalability, it will give EBRCSA the greatest potential to grow their network, adding unprecedented numbers of end users and applications, without having to make additional capital investment. In addition, the 7705 SAR portfolio offers a comprehensive set of T1/E1, T3/E3, SONET/SDH, serial data and analog voice interfaces. With these features, EBRCSA can gracefully migrate their applications onto their new IP/MPLS network. Critical traffic is expedited when using either high-speed Ethernet or legacy low-bandwidth links to ensure application performance

7705 SAR-18

7705 SAR-8

This industry-leading, independently-validated High Availability feature has been inherited from the Service Router product line and is a strong contributor to overall network uptime.

Network uplink connectivity options are: Ethernet, FE, GigE, n × T1/ E1 MLPPP or n × T1/E1 ATM IMA. Integrated DS3 point-to-point trunking is supported using the 4-port DS3 adapter card. OC-3/STM-1 trunking is supported using Packet over SONET/ SDH (POS) on the 4-port OC-3/STM-1 clear channel adapter card.

1.3.2 Network Management Solution

Motorola has proposed an integration of the MPLS equipment into the existing Unified Event Manager (UEM). EBRCSA will be able to perform Fault Management and receive all alarms coming from the MPLS equipment.

1.3.3 Improved Bandwidth and Traffic Control

An IP/MPLS network improves the bandwidth efficiency of a public safety network, reduces cost, enables easier access to existing databases, and enhances the safety of the general public as well as the safety of personnel delivering these services. MPLS has a built-in mechanism, called traffic engineering, which allows for the selection of the best path across the network, taking the physical paths of the links and interfaces into account. This mechanism is used in networks to ensure that the best link is chosen to optimize network bandwidth.

The 7705 SAR features a rich set of QoS mechanisms and can provide each service on the network with its own committed information rate and peak information rate as well as a priority value to use as it traverses the network. Strong QoS capabilities ensure service-level awareness and effective management of multiple traffic streams, providing guaranteed levels of QoS, especially constraints for delay and delay variation, for maintaining Service Level Agreements for the different entities using the IP/MPLS network.

1.3.4 Network Resiliency

The 7705 SAR features redundant power supplies, fans, controller cards, Ethernet cards, and Ethernet SFP optics modules to provide the highest levels of resiliency. Through the use of industry standard protocols like OSPF and MPLS combined with our custom enhancements, the IP/MPLS system can route services around network failures while maintaining service level agreements for critical traffic.

The microwave loop topology also provides a reliable architecture because traffic can be rerouted to the opposite direction if a physical failure occurs in a link connecting any adjacent sites. The IP/MPLS network uses the MPLS fast reroute feature for resiliency where traffic is rerouted around a failure with sub-50 millisecond restoration time. This ensures that services on the network are not affected.

1.3.5 Service Definition Requirements

It is critical to maintain the end-to-end quality of service (QoS) for packet traffic. Not all types of traffic have the same set of requirements. Voice traffic in particular requires low latency and jitter (latency variation) as well as low loss, whereas data traffic often has less stringent delay requirements but may be very sensitive to loss, as packet loss can seriously constrain

application throughput. To offer the required treatment throughout the network, traffic flows with different requirements are identified at the access and marked in-line with the appropriate QoS metrics. Traffic classification and marking are carried out based on the following categories:

- Time slot/port.
- Ethernet port/VLAN
- ATM service category (CBR/rt-VBR/ nrt-VBR/UBR)
- ATM VC
- Ethernet 802.1p/VLAN
- IP DSCP/MPLS EXP

The Nokia solution is unique in that its management system allows for true end to end provisioning of individual services from one end of the network to the other through multiple intermediate hops in under a minute with all the necessary QoS settings, bandwidth guarantees, and resiliency options provisioned. The solution offers every type of service connectivity option that a modern communications network requires. Service offerings include:

- Point to point TDM circuit emulation (Cpipe) for carrying circuits like T1s or RS232.
- Point to point Ethernet layer 1 (Epipe) – acts like a virtual patch cable.
- Point to multipoint Ethernet layer 2 (VPLS) – acts like a VLAN.
- Point to multipoint IP Layer 3 (VPRN) – acts like a virtual routed network.

The Nokia 7705 SAR utilizes extensive traffic management policies to ensure fairness with detailed classification and hierarchical scheduling including: minimum/maximum, queue type- based weighted round robin or strict priority and profiled scheduling, as well as multi-tier policing to differentiate and prioritize individual services and flows.

1.3.6 Quality of Service Requirements

The 7705 SAR can buffer thousands of individual services and then shape them to a strict SLA with Committed Information Rate (CIR) and Peak Information Rate (PIR) type guarantees.

Buffer allocation is programmable per-service to accommodate different maximum burst sizes (MBS). Each service can use up to eight queues to enable shaping, policing and marking of different flows. The 7705 can also shape and police on service egress. The 7705 SAR traffic classification is carried out based on Layer 1/Layer 2/Layer 2.5 and/or Layer 3 header, but not layer 4 (TCP/UDP port #).

1.4 BACKHAUL TRANSITION FROM T1 TO ETHERNET

The upgraded MW Backhaul will support simultaneously all current T1 traffic and new Ethernet traffic. The actual transition from T1 to Ethernet will likely occur until after the microwave radio upgrade and integration of the new MPLS equipment.

The Backhaul transition from T1 to Ethernet will be performed in several steps:

- Upgrade the P25 system to A2019 (keep existing T1 site links)
- Upgrade Microwave Network to Hybrid Radio configuration (all traffic still on T1)

- Integrate MPLS into the new Microwave Network (using Ethernet part of the Hybrid Radio)
- Migrate Repeater Sites and Dispatch Centers to Ethernet Site links
- Migrate Simulcast Subsystems to Ethernet

It is assumed that the T1 traffic plan has not changed and thus will be supported with the upgraded system. A more detailed transition plan will be developed during the Design Review.

During the creation of this project design, the following locations were identified as having both microwave (on the "A") and leased T1 connectivity (on the "B") to each site: ACCREC, WCPD, Oakland Fire, Oakland Law, Piedmont and Oakland Housing.

The following locations have fiber connectivity: Pleasant Hill PD and Concord PD (it has one link as microwave and one link as fiber).

Nokia SAR has been included for the following locations to allow for the migration to Ethernet connectivity:

SAR-8 Sites									
1	106_NM/Disp/Conv	**10**	Coyote Hills	**19**	Hayward Annex	**28**	Oakland HA PD	**37**	Turquoise (CCCO West Prime)
2	651 Pine	**11**	Cummings Peak (Prime CCCO Central+ RF for CCCO West)	**20**	Hayward PD	**29**	Patterson Pass	**38**	UC Berkeley PD
3	ACRECC	**12**	Doolan WT	**21**	Highland Peak	**30**	Pearl	**39**	UC Berkeley/KALX
4	ALCO Sheriff/San Leandro COM	**13**	East Dublin BART	**22**	Lakeside	**31**	Pleasant Hill PD	**40**	Walnut Creek BART
5	Alta Mesa Moraga	**14**	EB Regional Parks	**23**	Los Vaqueros	**32**	Rocky Ridge	**41**	Walpert Ridge
6	Benicia PD	**15**	El Cerrito PD	**24**	MSC	**33**	Richmond PD/Fire	**42**	Warm Springs
7	CCCO Fire	**16**	Fremont PD	**25**	Newark PD	**34**	Seneca		
8	CCCO NMD	**17**	Garin WT	**26**	Nichol Knob	**35**	Shadybrook		
9	CCCO Sheriff/40 Glacier	**18**	Glenn Dyer Jail (ALCO NW Prime)	**27**	Oakland Fire	**36**	Skyline Reservoir		
SAR-18 Sites									
1	Bald Peak	**2**	San Leandro Hills (Alco SW Prime)	**3**	Sunol Ridge	**4**	Kregor Peak Prime for CCCO East + RF for CCCO Central)	**5**	Oakland APL

The sites not included in the MPLS design will support only LMR traffic.

1.5 EQUIPMENT LIST

This section lists the equipment necessary for the proposed solution.

SUBSYSTEM	DESCRIPTION	PART NUMBER	TOTAL QTY
Microwave	**IRU600v4**		
Microwave	**6GHz**		
Microwave	IRU600v4 RFSEC ASSY NP, IF TR SP-HP 5.8-U6 GHz, Filter-non ACCP * in loop: 30MHz, 256Q, 180Mbps	EV202-AMT-000-410000	6
Microwave	IRU600v4 RFSEC ASSY NP, IF TR EHP U6 GHz, Filter-non ACCP * in loop: 30MHz, 256Q, 180Mbps	EV202-AEU-000-410000	4
Microwave	IRU600v4 RFSEC ASSY MHSB RX UNEQUAL SPLIT, IF TR SP-HP 5.8-U6 GHz, Filter-non ACCP * in spur: 10MHz, 64Q, 45Mbps	EV206-AMT-AM0-410000	2
Microwave	IRU600v4 RFSEC ASSY MHSB/SD TX SWITCH, IF TR SP-HP 5.8-U6 GHz, Filter-non ACCP * in spur: 10MHz, 64Q, 45Mbps * spur Sunol Ridge - Carroll Drive 30MHz 256Q 180Mbps	EV207-AMT-AM0-410000	5
Microwave	**11GHz**		
Microwave	IRU600v4 RFSEC ASSY NP, IF TR SP-HP 10.5-11 GHz, Filter-non ACCP * in loop: 30MHz, 256Q, 180Mbps	EV202-AMC-000-410000	36
Microwave	IRU600v4 RFSEC ASSY NP, IF TR EHP 11 GHz, Filter-non ACCP * in loop: 30MHz, 256Q, 180Mbps	EV202-AEB-000-410000	6
Microwave	IRU600v4 RFSEC ASSY MHSB RX UNEQUAL SPLIT, IF TR SP-HP 10.5-11 GHz, Filter-non ACCP * in spur: 10MHz, 64Q, 45Mbps	EV206-AMC-AM0-410000	31
Microwave	IRU600v4 RFSEC ASSY MHSB RX UNEQUAL SPLIT, IF TR EHP 11 GHz, Filter-non ACCP * in spur: 10MHz, 64Q, 45Mbps	EV206-AEB-AE0-410000	3
Microwave	**ODU600v2**		
Microwave	ODU 600v2, 11 GHZ, PLANNING PART NUMBER * in loop: 30MHz, 256Q, 180Mbps * in spur: 10MHz, 64Q, 45Mbps	M-ECH-11	20
Microwave	Coupler Assy ODU 600v2 , 10/11 GHz Unequal 6 dB, V and H Pole	086-523300-116	8
Microwave	WTM 4100/4200 ODU600v2 10/11 GHz Waveguide Transition Kit, WR 90 waveguide, UDR 100 flange	179-530500-011	12
Microwave	Remote Mount Bracket Assembly ODU600v2	179-530502-001	24
Microwave	ECLIPSE POLE MOUNT FOR USE WITH SINGLE ODU OR PROTECTION COUPLER (RM99/DE)	086-000000-101	
Microwave	**IRU600v4 WAVEGUIDE EXT KIT**		
Microwave	**6GHz**		
Microwave	WG EXT KIT IRU600 V3 6GHZ SH1-PO1, 1+0/MHSB 1ANT, RPTR(MAIN)	179-530135-AA101	3
Microwave	WG EXT KIT IRU600 V3 6GHZ SH1-PO1, 1+0/MHSB 2 ANT, MHSB/SD	179-530135-AA103	5

SUBSYSTEM	DESCRIPTION	PART NUMBER	TOTAL QTY
Microwave	WG EXT KIT IRU600 V3 6GHZ SH2-PO2, 1+0/MHSB 1ANT, RPTR(MAIN)	179-530135-BB201	6
Microwave	WG EXT KIT IRU600 V3 6GHZ SH3-PO3, 1+0/MHSB 1ANT, RPTR(MAIN)	179-530135-CC301	2
Microwave	WG EXT KIT IRU600 V3 6GHZ SH4-PO4, 1+0/MHSB 2 ANT, MHSB/SD	179-530135-DD403	3
Microwave	**11GHz**		
Microwave	WG EXT KIT IRU600 V3 11GHZ SH1-PO1, 1+0/MHSB 1ANT, RPTR(MAIN)	179-530135-AA121	43
Microwave	WG EXT KIT IRU600 V3 11GHZ SH2-PO2, 1+0/MHSB 1ANT, RPTR(MAIN)	179-530135-BB221	23
Microwave	WG EXT KIT IRU600 V3 11GHZ SH3-PO3, 1+0/MHSB 1ANT, RPTR(MAIN)	179-530135-CC321	9
Microwave	WG EXT KIT IRU600 V3 11GHZ SH4-PO3, 1+0/MHSB 1ANT, RPTR(MAIN)	179-530135-DD321	2
Microwave	**WAVEGUIDE EXT BRACKET KIT**		
Microwave	EXT BRKT KIT IRU600 2 SHELF	179-530089-001	18
Microwave	EXT BRKT KIT IRU600 3 SHELF	179-530089-002	9
Microwave	EXT BRKT KIT IRU600 4 SHELF	179-530089-003	6
Microwave	CUSTOM WAVEGUIDE KIT COMPLEXITY 1	WGKIT-1000	43
Microwave	**INUe**		
Microwave	ECLIPSE, INTELLIGENT NODE UNIT 2RU, INC IDCE, FAN, NCCV2, HIGH OUTPUT	EXX-000-204	113
Microwave	KIT BRACKET 2RU	179-530064-001	113
Microwave	NODE PROTECTION CARD, HIGH OUTPUT	EXS-002	113
Microwave	**RAC**		
Microwave	RAC 70, QPSK-4096QAM, NO XPIC, ACM	EXR-700-001	155
Microwave	**DAC OC-3**		
Microwave	DAC 155OM, 1XSTM1/OC3 MUXED TO 63E1/84DS1, SM OPTICAL, S-1.1, SR, 15KM OR LESS	EXD-156-001	163
Microwave	CABLE, OPTICAL JMPR, LC-LC, SM-DUP, 9/125UM, 3M/9.8FT	LOC-203-3500-003/3MIL	74
Microwave	CABLE, OPTICAL JMPR, LC-LC, SM-DUP, 9/125UM, 5M/16.4FT	LOC-203-3500-005/3MI	21
Microwave	CABLE, OPTICAL JMPR, LC-LC, SM-DUP, 9/125UM, 10M/32.8FT	LOC-203-3500-010/3MI	8
Microwave	**DAC DS1**		
Microwave	NETWORK CONVERGENCE MODULE (NCM)	EXD-400-002	60
Microwave	ECLIPSE, DAC 16XE1/DS1 V3, PROTECTABLE	EXD-161-002	142
Microwave	2x HDR-E50 TO Y JOIN TO 24AWG FREE END 3.5M	037-579408-003	144
Microwave	2x HDR-E50 TO Y JOIN TO 24AWG FREE END 15.5M	037-579408-015	2
Microwave	**DAC ETHERNET**		
Microwave	DAC GE3 GIGABIT ETHERNET SWITCH CARD	EXD-181-002	162
Microwave	CABLE PROT / BRIDGEING GE3, DIRECT FIT, 500mm	037-579461-500	77
Microwave	XCVR ELECTRICAL SFP, GE3 ONLY, W/LOS 3V3 COM	083-845434-001	158
Microwave	ETHERNET CABLE, RJ45 CAT 5/CAT 5e, 2m (6.5')	037-579124-002	104
Microwave	ETHERNET CABLE,CAT5/CAT5E,RJ-45,5 M LONG	037-579125-002	28

SUBSYSTEM	DESCRIPTION	PART NUMBER	TOTAL QTY
Microwave	ETHERNET CABLE,CAT5/CAT5E,RJ-45,15 M LONG	037-579126-002	6
Microwave	GIG ETH SFP, OPT SMF 1310nm LC 1000BASE-LX, <10 KM	079-422656-001	156
Microwave	CABLE, OPTICAL JMPR, LC-LC, SM-DUP, 9/125UM, 10M/32.8FT	LOC-203-3500-010/3MI	156
Microwave	**ALARM CARD**		
Microwave	AUX, ALARM I/O CARD	EXA-001	54
Microwave	CABLE, ALARM I/O HD15 TO WIREWRAP, 15M	037-579470-015	54
Microwave	**Software Licenses**		
Microwave	IRU600 600 High power option 1 x RFU	EZF-61	9
Microwave	IRU600 600 Nodal High power option 2 x RFU	EZF-62	4
Microwave	ODU 600 High power option 1 x ODU	EZF-51	1
Microwave	ODU 600 Nodal High power option 2 x ODU	EZF-52	1
Microwave	NODE SW LICENSE, 400 Mbps TOTAL RADIO PAYLOAD CAPACITY	EZE-08006	5
Microwave	NODE SW LICENSE, 200 Mbps TOTAL RADIO PAYLOAD CAPACITY	EZE-08004	48
Microwave	NODE SW LICENSE, 100 Mbps TOTAL RADIO PAYLOAD CAPACITY	EZE-08002	2
Microwave	50 Mbps Node radio capacity License	EZE-08001	59
Microwave	NCM LOOP SWITCH License to support up to 50E1/63T1 TDM circuits	EZF-14	33
Microwave	LAYER 1 LINK AGGREGATION NODAL ON DAC GE / DAC GE3	EZF-01	79
Microwave	CIRCUIT BREAKER 15 AMP SNAPAK	PWR-000052-TRM	226
Microwave	SIPQ-CABLES - All Equipment interconnections	SIPQ-CABLES	47
Microwave	**SPARES**		
Microwave	**IRU600v4**		
Microwave	RFU, MP, IRU600v4 IF TR, 5.8-L6-U6 GHz, 5725-7125 MHz	ERM-ATT-400	2
Microwave	RFU, MP, IRU600v4 IF TR, 10.5-11 GHz, 10500-11700 MHz	ERM-ACC-400	2
Microwave	RFU, EHP, IRU600v4 IF TR, L6 GHz, 5925-6425 MHz	ERE-AL6-400	
Microwave	RFU, EHP, IRU600v4 IF TR, U6 GHz, 6400-7125 MHz	ERE-AU6-400	2
Microwave	RFU, EHP, IRU600v4 IF TR, 11 GHz, 10700-11700 MHz	ERE-ABB-400	2
Microwave	FAN TRAY KIT, IRU600v4 (2 Fan Trays per Kit)	179-531050-001	2
Microwave	**ODU600v2**		
Microwave	ODU 600v2, 11 GHZ, PLANNING PART NUMBER	M-ECH-11	4
Microwave	KIT, LIGHTNING ARRESTOR, UNIVERSAL, 50 OHM, MALE TO FEMALE	179-530062-002	4
Microwave	**INUe**		
Microwave	INUe, 2RU FAN CARD EXTENDED LIFE	EXF-102	2
Microwave	Air Filter Assembly INUe	131-501768-001	2
Microwave	ECLIPSE, NODE CONTROLLER CARD, SERIAL MGMT V2	EXN-004	2
Microwave	NODE PROTECTION CARD, HIGH OUTPUT	EXS-002	2
Microwave	RAC 70, QPSK-4096QAM, NO XPIC, ACM	EXR-700-001	2

SUBSYSTEM	DESCRIPTION	PART NUMBER	TOTAL QTY
Microwave	DAC 155OM, 1XSTM1/OC3 MUXED TO 63E1/84DS1, SM OPTICAL, S-1.1, SR, 15KM OR LESS	EXD-156-001	2
Microwave	NETWORK CONVERGENCE MODULE (NCM)	EXD-400-002	2
Microwave	ECLIPSE, DAC 16XE1/DS1 V3, PROTECTABLE	EXD-161-002	2
Microwave	DAC GE3 GIGABIT ETHERNET SWITCH CARD	EXD-181-002	2
Microwave	AUX, ALARM I/O CARD	EXA-001	2
Microwave	**JACKFIELDS**		
Microwave	JACKFIELD,FIXED,DSX-1,56 CIRCUITS,4 RU,19 INCHES OR 23 INCHES WIDTH,FRONT WIREWRAP X-CONN, REAR WIREWRAP,BLACK,-48VDC INPUT (010-0156-0601)	TEL-010-0156-0601	39
Microwave	JACKFIELD,FIXED,DSX-1,32 CIRCUITS,2 RU,19 INCHES OR 23 INCHES WIDTH,FRONT WIREWRAP X-CONN, REAR WIREWRAP,BLACK,-48VDC INPUT	TEL-010-0132-0101	23
Microwave	CIRCUIT BREAKER 1 AMP SNAPAK	PWR-000046-TRM	62
Microwave	**RACK & ACCESSORIES**		
Microwave	RACK ASSY CRATED, 7' CHATSWORTH ALUMINUM, 1 BREAKER PNL W/10 BLANK COVERS AND NO BREAKERS	179-530307-0113	50
Microwave	RACK ASSY CRATED, 8' CHATSWORTH ALUMINUM, 1 BREAKER PNL W/10 BLANK COVERS AND NO BREAKERS	179-530307-0115	2
Microwave	Installation Kit, Aluminum Rack, Concrete Floor	179-530119-001	52
Microwave	GROUND BAR,KIT,RACK,R56 COMPLIANT,72 INCHES L X 5/8 INCHES WIDE X 1/4 INCHES DEPTH	LOC-TRGBVKIT145872W	52
Microwave	CHANNEL MOUNTING, FORWARD, U-SHAPE, 4 INCHES LONG (FORWARD) X 5/8 INCHES WIDE X 1.75 INCHES HIGH (1 RU)	020-018475-005	156
Microwave	6A/6B POS., +/-48-24VDC, W/O BRKRS, 19"	PWR-000070-TRM	8
Microwave	STANDARD DC AND GND KIT	179-530118-001	8
Microwave	CIRCUIT BREAKER 3 AMP SNAPAK	PWR-000048-TRM	4
Microwave	ETHERNET CABLE, RJ45 CAT 5/CAT 5e, 2m (6.5')	037-579124-002	2
Microwave	ETHERNET CABLE,CAT5/CAT5E,RJ-45,5 M LONG	037-579125-002	2
Microwave	ETHERNET CABLE,CAT5/CAT5E,RJ-45,15 M LONG	037-579126-002	2
Microwave	**FLEXTWIST, WAVEGUIDE, ACCESSORIES**		
Microwave	**For ODU600v2 Remote-Mount reusing existing antenna**		
Microwave	WR90ODU-KIT (ONE KIT REMOTE MOUNT)	AND-WR90ODU-KIT	7
Microwave	CABLE, ODU, 9913, WITH CONN/GROUND KIT, 50M(164FT) CNT400 CCAL TYPE	037-579311-050	4
Microwave	CABLE,ODU,9913 WITH CONN.GROUND KIT, 100M(328FT) CNT400 TYPE	037-579311-100	
Microwave	CABLE, ODU, 9913, WITH CONN/GROUND KIT, 150M(492FT) CNT400 CCAL TYPE	037-579311-150	6
Microwave	LIGHTNING ARRESTOR KIT, UNIVERSAL, 50 OHM, TYPE N, MALE TO FEMALE * This arrestor is supplied with a 1M long ground cable and	179-530062-002	10

SUBSYSTEM	DESCRIPTION	PART NUMBER	TOTAL QTY
	a 2 hole termination lug		
Microwave	ADAPTER, ANGLE, SS, FOR MINI CLICK-ON HANGAERS (10/PK)	179-530160-005	103
Microwave	MINIATURE CLICK-ON HANGER FOR 9-12 MM	179-530160-007	103
Microwave	HARDWARE, SNGL STACK, SS, FOR MINI CLICK -ON HANGERS (10/PK)	AND-252027-10KT-P	103
Microwave	WG CUSHION ASSY LMR-400 3/8" FLEX, 2 HOLES (Bag of 5 Kits)	VLT-SRLR42-K	163
Microwave	LMR-400 STANDARD BLK UV RATED	WEB-LMR-400	2200
Microwave	CONNECTOR KIT N TYPE M&F 400 TYPE CABLE	179-530057-001	16
Microwave	KIT, LIGHTNING ARRESTOR, UNIVERSAL, 50 OHM, MALE TO FEMALE	179-530062-002	8
Microwave	UNIVERSAL COAXIAL GROUNDING KIT	086-523257-001	24
Microwave	GROUND CONDUCTOR TOWER TERMINATION	023-380000-001	24
Microwave	WEATHERPROOFING KIT	011-390001-001	8
Microwave	HOISTGRIP, FOR 3/8IN CNT-400 CBL	AND-C2SGRIP	8
Microwave	THREAD ROD SUPPORT 12IN (305MM) LONG, KIT OF 5	AND-31771-4	19
Microwave	ADAPTER, ANGLE, SS, FOR MINI CLICK-ON HANGAERS (10/PK)	179-530160-005	73
Microwave	HARDWARE, SNGL STACK, SS, FOR MINI CLICK -ON HANGERS (10/PK)	AND-252027-10KT-P	73
Microwave	MINIATURE CLICK-ON HANGER FOR 9-12 MM	179-530160-007	73
Microwave	WG CUSHION ASSY LMR-400 3/8" FLEX, 2 HOLES (Bag of 5 Kits)	VLT-SRLR42-K	140
Microwave	**For ODU600v2 Remote Mount - replace 10GHz to 11 GHz**		
Microwave	WR90ODU-KIT (ONE KIT REMOTE MOUNT)	AND-WR90ODU-KIT	6
Microwave	CABLE, ODU, 9913, WITH CONN/GROUND KIT, 50M(164FT) CNT400 CCAL TYPE	037-579311-050	10
Microwave	LIGHTNING ARRESTOR KIT, UNIVERSAL, 50 OHM, TYPE N, MALE TO FEMALE	179-530062-002	10
Microwave	ADAPTER, ANGLE, SS, FOR MINI CLICK-ON HANGAERS (10/PK)	179-530160-005	55
Microwave	MINIATURE CLICK-ON HANGER FOR 9-12 MM	179-530160-007	55
Microwave	HARDWARE, SNGL STACK, SS, FOR MINI CLICK -ON HANGERS (10/PK)	AND-252027-10KT-P	55
Microwave	WAVEGUIDE CUSHION HANGER, KITS, LMR-400 3/8" FLEX, 2-HOLE (BAG OF 5 KITS)	VLT-SRLR42-K	33
Microwave	LMR-400 STANDARD BLK UV RATED	WEB-LMR-400	1600
Microwave	CONNECTOR KIT N TYPE M&F 400 TYPE CABLE	179-530057-001	12
Microwave	KIT, LIGHTNING ARRESTOR, UNIVERSAL, 50 OHM, MALE TO FEMALE	179-530062-002	6
Microwave	UNIVERSAL COAXIAL GROUNDING KIT	086-523257-001	18
Microwave	GROUND CONDUCTOR TOWER TERMINATION	023-380000-001	18
Microwave	WEATHERPROOFING KIT	011-390001-001	6
Microwave	HOISTGRIP, FOR 3/8IN CNT-400 CBL	AND-C2SGRIP	6

SUBSYSTEM	DESCRIPTION	PART NUMBER	TOTAL QTY
Microwave	THREAD ROD SUPPORT 12IN (305MM) LONG, KIT OF 5	AND-31771-4	6
Microwave	ADAPTER, ANGLE, SS, FOR MINI CLICK-ON HANGAERS (10/PK)	179-530160-005	52
Microwave	HARDWARE, SNGL STACK, SS, FOR MINI CLICK -ON HANGERS (10/PK)	AND-252027-10KT-P	52
Microwave	MINIATURE CLICK-ON HANGER FOR 9-12 MM	179-530160-007	52
Microwave	WG CUSHION ASSY LMR-400 3/8" FLEX, 2 HOLES (Bag of 5 Kits)	VLT-SRLR42-K	104
Microwave	**Changing 10GHz to 11GHz Materials**		
Microwave	**Antennas**		
Microwave	ANTENNA, 11 GHZ, 1.0 M (3FT), VALULINE, HPLP, REMOTE MOUNT, PARABOLIC (STD: WHITE), 10.1-11.7 GHZ, RADOME (STD: WHITE), CPR90G, SINGLE POLARIZED, CLASS III/FCC101A/B, SINGLE PIECE REFLECTOR, 250 KMPH, 200 KMPH 1.0 m | 3 ft ValuLine® High Performance Low Profile Antenna, single-polarized, 10.125–11.700 GHz, CPR90G flange, white antenna, composite broadband grey radome without flash, standard pack—one-piece reflector	AND-VHLP3-11W-6WH	18
Microwave	LEG MOUNT,UP TO 6 FEET ANTENNA DIAMETER,UP TO 8 INCHES DEPTHIAMETER LEG,WITH WAVEGUIDE EQUIPMENT PROTECTION SHIELD KIT	179-530147-001	17
Microwave	**Waveguide & Accessories**		
Microwave	ELLIPTICAL WAVEGUIDE STANDARD, 10.2-11.7 GHZ, BLACK PE JACKET, PER FOOT	AND-EW90-F	1470
Microwave	EW90INSTALL-KIT (ONE KIT PER WAVEGUIDE RUN)	AND-EW90INSTALL-KIT	12
Microwave	HARDWARE-KIT (ONE KIT PER 100FT)	AND-HARDWARE-KIT	16
Microwave	WG CUSHION EW-90 1 HOLE (Bag of 5 Kits)	VLT-SREW90-K	99
Microwave	ENTRY BOOT, 4" CABLE BOOT ASSEMBLY FOR EW90, 1-HOLE	020-500001-001	12
Microwave	**PROVISION NMS MANAGEMENT**		
Microwave	Provision INM Complete Single Server - Hardware and Software Configured INCLUDES: * PV-INM-GPS7118 PROVISION INM REMOTE INSTALLATION SERVICE - ONE PER INM SERVER * PV-INM-278-0182 PROVISION INM SERVER HARDWARE - SR6.0 SINGLE SERVER W12 HP DL380 G8 Rack Mountable 2RU 2-way, 12GB RAM, 6x146GB & 3x300GB HDDs, WS2012 R2 STD * PV-INM-SYBASE PROVISION INM SYBASE SOFTWARE * PV-INM-ADAPTERS PROVISION INM ADAPTERS	PV-INM-SERVER-001	1
Microwave	KVM SWITCH, 8-PORT NETDIRECTOR 1U RACKMOUNT CONSOLE KVM SWITCH W/17" LCD	LOC-B020-008-17	2
Microwave	MOUNTING BRACKET, 2-POST RACK MOUNT BRACKET FOR 614-100137-001 KVM CONSOLE	614-100137-002	1

SUBSYSTEM	DESCRIPTION	PART NUMBER	TOTAL QTY
MPLS	**NOKIA MPLS EQUIPMENT**		
MPLS	**Small MPLS Routers**		
MPLS	SAR-8 SHELF V2	DSMW3HE06791AA	42
MPLS	CONTROL SWITCH MODULE V2 (CSMV2) 48	DSMW3HE02774AB	84
MPLS	SAR RELEASE 9.0 BASIC OS LICENSE	DSMW3HE02784MA	42
MPLS	FAN MODULE (SAR-8 SHELF V2) EXT TEM	DSMW3HE06792EA	42
MPLS	PMC CARD W/ 4 GIG-E SFP BUNDLE (1)	DSMW3HE11473AK	84
MPLS	SFP - GIGE BASE-T RJ45 R6/6 DDM -40	DSMW3HE11904AA	168
MPLS	**Large MPLS Routers**		
MPLS	SAR-18 SHELF	DSMW3HE04991AA	5
MPLS	CONTROL SWITCH MODULE FOR SAR-18	DSMW3HE04992AA	10
MPLS	SAR-18 RELEASE 9.0 BASIC OS LICEN	DSMW3HE05574HA	5
MPLS	FAN MODULE FOR SAR-18	DSMW3HE04993AA	5
MPLS	PMC CARD W/ 4 GIG-E SFP BUNDLE (1)	DSMW3HE11473AK	20
MPLS	SFP - GIGE BASE-T RJ45 R6/6 DDM -40	DSMW3HE11904AA	40
MPLS	BREAKER, 10 AMP	DSSP4KHAM10B1A	120
MPLS	**Spares**		
MPLS	SAR-8 SHELF V2	DSMW3HE06791AA	4
MPLS	CONTROL SWITCH MODULE V2 (CSMV2) 48	DSMW3HE02774AB	8
MPLS	SAR RELEASE 9.0 BASIC OS LICENSE	DSMW3HE02784MA	4
MPLS	FAN MODULE (SAR-8 SHELF V2) EXT TEM	DSMW3HE06792EA	4
MPLS	PMC CARD W/ 4 GIG-E SFP BUNDLE (1)	DSMW3HE11473AK	8
MPLS	SFP - GIGE BASE-T RJ45 R6/6 DDM -40	DSMW3HE11904AA	16
MPLS	SAR-18 SHELF	DSMW3HE04991AA	2
MPLS	CONTROL SWITCH MODULE FOR SAR-18	DSMW3HE04992AA	4
MPLS	SAR-18 RELEASE 9.0 BASIC OS LICEN	DSMW3HE05574HA	2
MPLS	FAN MODULE FOR SAR-18	DSMW3HE04993AA	2
MPLS	PMC CARD W/ 4 GIG-E SFP BUNDLE (1)	DSMW3HE11473AK	8
MPLS	SFP - GIGE BASE-T RJ45 R6/6 DDM -40	DSMW3HE11904AA	16
MPLS	**NMS**		
MPLS	FORTINET FIREWALL APPLIANCE	T8586	2
MPLS	2930F 24-PORT SWITCH	CLN1868	2

SECTION 2

IMPLEMENTATION PLAN

2.1 STATEMENT OF WORK

Motorola will install and configure the proposed equipment. The following table describes the tasks involved with installation and configuration.

Tasks	Motorola	EBRCSA
PROJECT INITIATION		
Contract Finalization and Team Creation		
Execute contract and distribute contract documents.	X	X
Assign a Project Manager as a single point of contact.	X	X
Assign resources.	X	X
Schedule project kickoff meeting.	X	X
Deliverable: Signed contract, defined project team, and scheduled project kickoff meeting.		
Project Administration		
Ensure that project team members attend all meetings relevant to their role on the project.	X	X
Record and distribute project status meeting minutes.	X	
Maintain responsibility for third-party services contracted by Motorola.	X	
Complete assigned project tasks according to the project schedule.	X	X
Submit project milestone completion documents.	X	
Upon completion of tasks, approve project milestone completion documents.		X
Conduct all project work Monday thru Friday, 8:00 a.m. to 5:00 p.m.).	X	
Deliverable: Completed and approved project milestones throughout the project.		
Project Kickoff		
Introduce team, review roles, and decision authority.	X	X
Present project scope and objectives.	X	
Review SOW responsibilities and project schedule.	X	X
Schedule Design Review.	X	X
Deliverable: Completed project kickoff and scheduled Design Review.		

Tasks	Motorola	EBRCSA
Design Review		
Review the Customer's operational requirements.	X	X
Present the system design and operational requirements for the solution.	X	
Present installation plan.	X	
Present preliminary cutover plan and methods to document final cutover process.	X	
Present configuration and details of sites required by system design.	X	
Validate that Customer sites can accommodate proposed equipment.	X	X
Provide approvals required to add equipment to proposed existing sites.		X
Review safety, security, and site access procedures.	X	
Present equipment layout plans and system design drawings.	X	
Provide backhaul performance specifications and demarcation points.	X	
Provide heat load and power requirements for new equipment.	X	
Provide information on existing system interfaces.		X
Assume liability and responsibility for proving all information necessary for complete installation.		X
Assume responsibility for issues outside of Motorola's control.		X
Complete the required forms required for frequency coordination and licensing.	X	
Ensure that frequency availability and licensing meet project requirements, and pay licensing and frequency coordination fees.		X
Review and update design documents, including System Description, Statement of Work, Project Schedule, and Acceptance Test Plan, based on Design Review agreements.	X	
Execute Change Order in accordance with all material changes to the Contract resulting from the Design Review.	X	
Deliverable: Finalized design documentation based upon "frozen" design, along with any relevant Change Order documentation.		
SITE PREPARATION AND DEVELOPMENT		
Site Access		
Provide site owners/managers with written notice to provide entry to sites identified in the project design documentation.		X
Ensure that sufficient space is available at the site for heavy-duty construction vehicles to maneuver under their own power, without assistance from other equipment.		X
Obtain site licensing and permitting, including site lease/ownership, zoning, permits, regulatory approvals, easements, power, and telco connections.		X

Tasks	Motorola	EBRCSA
Deliverable: Access, permitting, and licensing necessary to install system equipment at each site.		
Site Planning		
Provide necessary buildings, equipment shelters, and towers for installation of system equipment.		X
Provide the R56 requirements for space, power, grounding, HVAC, and connectivity requirements at each site.	X	
Provide adequate electrical power in proper phase and voltage at sites.		X
Provide as-built structural and foundation drawings of the structures and site locations, along with geotechnical reports, in order to facilitate a structural analysis.		X
Perform structural analysis of towers, rooftops, or other structures to confirm that they are capable of supporting proposed and future antenna loads.		X
Confirm that there is adequate utility service to support the new equipment and ancillary equipment.		X
Modify towers or other structures, or relocate sites in the system, to ensure that they are capable of supporting proposed and future antenna loads.		X
Conduct site walks to collect pertinent information (e.g. location of telco, power, structures, etc.)	X	
Ensure that each site meets the R56 standards for space, grounding, power, HVAC, and connectivity requirements.		X
Prepare site construction drawings showing the layout of new and existing equipment.	X	
Review and approve site construction drawings.		X
Ensure that required rack space is available for installation of the new equipment.		
Deliverable: Information and permitting requirements completed at each site.		
General Facility Improvements		
Provide adequate HVAC, grounding, lighting, cable routing, and surge protection based upon Motorola's Standards and Guidelines for Communication Sites (R56)		X
Ensure the resolution of environmental and hazardous material issues at each site including, but not limited to, asbestos, structural integrity (tower, rooftop, water tank, etc.), and other building risks.		X
Ensure that electrical service will accommodate installation of system equipment, including isolation transformers, circuit breakers, surge protectors, and cabling.		X
Provide obstruction-free area for the cable run between the demarcation point and system equipment.		X
Provide structure penetrations (wall or roof) for transmission equipment (e.g. antennas, microwave radios, etc.).		X
Supply interior building cable trays, raceways, conduits, and wire supports.		X
Transport removed site equipment to a desired location.		X

Tasks	Motorola	EBRCSA
Deliverable: Sites meet physical requirements for equipment installation.		
SYSTEM INSTALLATION		
Equipment Order and Manufacturing		
Create equipment order and reconcile to contract.	X	
Manufacture Motorola Solutions-provided equipment necessary for system based on equipment order.	X	
Procure non-Motorola Solutions equipment necessary for the system.	X	
Deliverable: Equipment procured and ready for shipment.		
System Staging		
Ship all equipment needed for staging to Motorola's Customer Center for Solutions Integration (CCSi).	X	
Provide information on existing system interfaces, room layouts, or other information necessary for the assembly to meet field conditions.		X
Set up and rack the solution equipment on a site-by-site basis, as it will be configured in the field at each of the sites.	X	
Assemble required subsystems to assure system functionality.	X	
Power up, load application parameters, program, and test all staged equipment.	X	
Confirm system configuration and software compatibility with the existing system.	X	
Inventory the equipment with serial numbers and installation references.	X	
Deliverable: System staged and ready for shipment.		
Equipment Shipment and Storage		
Provide secure location for solution equipment.		X
Pack and ship solution equipment to the identified, or site locations.	X	
Receive solution equipment.		X
Inventory solution equipment.	X	
Deliverable: Solution equipment received and ready for installation		
General Installation		
Deliver solution equipment to installation location.	X	
Coordinate receipt of and inventory solution equipment with designated contact.	X	
Install all proposed fixed equipment as outlined in the System Description based upon the agreed-upon floor plans, connecting audio, control, and radio transmission cables to connect equipment to the power panels or receptacles, and audio/control	X	

Tasks	Motorola	EBRCSA
line connection points. Installation performed in accordance with R56 standards and state/local codes.		
Provide system interconnections that are not specifically outlined in the system design, including dedicated phone circuits, microwave links, or other types of connectivity.		X
Install and terminate all network cables between site routers and network demarcation points, including microwave, leased lines, and Ethernet.	X	
Ensure that Type 1 and Type 2 AC suppression is installed to protect installed equipment.		X
Connect installed equipment to the provided ground system.	X	
Label equipment, racks, and cables.	X	
Perform preliminary audit of installed equipment to ensure compliance with requirements and R56 standards.	X	
Note any required changes to the installation for inclusion in the “as-built” system documentation.	X	
Remove, transport, and dispose of old equipment.		X
Deliverable: Equipment installed.		
SYSTEM OPTIMIZATION AND TESTING		
R56 Site Audit		
Perform R56 site-installation quality-audits, verifying proper physical installation and operational configurations.	X	
Create site evaluation report to verify site meets or exceeds requirements, as defined in Motorola’s R56 Standards and Guidelines for Communication Sites.	X	
Deliverable: R56 Standards and Guidelines for Communication Sites audits completed successfully.		
Solution Optimization		
Verify that all equipment is operating properly and that all electrical and signal levels are set accurately.	X	
Verify communication interfaces between devices for proper operation.	X	
Ensure that functionality meets manufacturers’ specifications and complies with the final configuration established during design review or system staging.	X	
Deliverable: Completion of System Optimization.		
Functional Acceptance Testing		
Verify the operational functionality and features of the solution supplied by Motorola, as contracted.	X	
Witness the functional testing.		X
Document all issues that arise during the acceptance tests.	X	
If any major task for the system as contractually described fails during the Customer acceptance testing or beneficial use, repeat	X	

Tasks	Motorola	EBRCSA
that particular task after Motorola Solutions determines that corrective action has been taken.		
Resolve any minor task failures before Final System Acceptance.	X	
Document the results of the acceptance tests and present for review.	X	
Review and approve final acceptance test results.		X
Deliverable: Completion of functional testing and approval by Customer.		
PROJECT TRANSITION		
Cutover		
Finalize Cutover Plan.	X	X
Conduct cutover meeting with relevant personnel to address both how to mitigate technical and communication problem impacts to the users during cutover and during the general operation of the system.	X	
Notify the personnel affected by the cutover of the date and time planned for cutover.		X
Provide ongoing communication with users regarding the project and schedule.	X	X
Resolve punchlist items, documented during the Acceptance Testing phase, in order to meet all the criteria for final system acceptance.	X	
Assist Motorola with resolution of identified punchlist items by providing support, such as access to the sites, equipment and system, and approval of the resolved punchlist items.		X
Deliverable: Migration to new system completed, and punchlist items resolved.		
Transition to Warranty		
Review the items necessary for transitioning the project to warranty support and service.	X	
Motorola to provide services in conjunction with the proposed services.	X	
Provide a Customer Support Plan detailing the warranty support associated with the contract equipment.	X	
Participate in the Transition Service/Project Transition Certificate (PTC) process.		X
Deliverable: Service information delivered and approved by Customer		
Finalize Documentation and System Acceptance		
Provide manufacturer's installation material, part list and other related material to Customer upon project completion.	X	

Tasks	Motorola	EBRCSA
Provide an electronic as-built system manual on CD or other Customer preferred electronic media. The documentation will include the following: ▪ Site Block Diagrams. ▪ Site Floor Plans. ▪ Site Equipment Rack Configurations. ▪ ATP Test Checklists. ▪ Functional Acceptance Test Plan Test Sheets and Results. ▪ Equipment Inventory List. ▪ Maintenance Manuals (where applicable). ▪ Technical Service Manuals (where applicable). Drawings will be delivered in Adobe PDF format.	X	
Receive and approve documentation.		X
Execute Final Project Acceptance.	X	X
Deliverable: All required documents are provided and approved. Final Project Acceptance.		

2.2 ASSUMPTIONS

Motorola has made several assumptions in preparing this proposal for EBRCSA related to the design of the solution as well as to the project implementation:

1. All existing sites or equipment locations will have sufficient space available for the system described. Relocation or removal and/or reinstallation of any equipment to accommodate the installations are not covered and will be quoted separately.
2. All existing sites or equipment locations will have adequate electrical power and site grounding suitable to support the requirements of the system described.
3. Motorola intends to reuse the existing DC Power system at all sites. The DC power system provided by EBRCSA will have sufficient power to support the old equipment and new equipment at each of the sites during the testing and migration period.
4. Any site/location upgrades or modifications are the responsibility of EBRCSA.
5. Any tower stress analysis or tower upgrade requirements are the responsibility of EBRCSA.
6. Approved local, State, or Federal permits as may be required for the installation and operation of the proposed equipment, are the responsibility of EBRCSA.
7. Any inaccuracies in FCC data may drive additional services costs during field implementation. In addition, any other troubleshooting tasks related to frequency interference issues that are not directly attributable to Motorola are subject to additional service fees at rates define in this proposal.
8. As requested by EBRCSA, Motorola has removed the Carol Drive and Twin Peaks sites from the MW design and has not included any upgrade equipment for those sites.
9. Motorola has considered 1 future radio site in the MPLS design and has included the corresponding equipment for it.
10. The sites not included in the MPLS design will only support LMR traffic.

11. All ODU600 (outdoor RFU) will be remote-mounted to antenna and new 3ft Flextwist and new coaxial cables are proposed to replace existing coaxial cables. Assuming there is an existing conduit and passage for the Coax cable.
12. Existing antennas, centerlines and waveguide lines will be reused at most sites (with exception to those specifically mentioned in the Solution Description).
13. DC distribution panel is not more than 30 ft far from the MW equipment rack.
14. Motorola will reuse the existing Dehydrators and manifold systems, and those should be capable to support the new equipment.
15. Motorola has included one set of spares for each of the EBRCSA shops in Alameda County and Contra Costa County.
16. Demarcation point will be as follows:
    - For T1, it will be on new DS-1 circuits terminated on DSX-1 jackfield panel
    - For Ethernet, it will be on Ethernet port on the DACGE3
17. All equipment interconnections or termination points, unless specified otherwise, are estimated to be 50 feet. This project does not include any cabling between buildings, rooms, or floors, unless specifically identified in this proposal.
18. EBRCSA provided construction drawings will have sufficient details for Motorola engineering to order antenna mounting or any other related material required. Any re-engineering to provide correct mounts or material required by Motorola may increase cost to EBRCSA.
19. Motorola shall not be responsible for the condition of existing equipment or the deficiencies of non-Motorola provided labor.

2.3 ACCEPTANCE TEST PLAN

System Acceptance of the proposed solution will occur upon successful completion of a Functional Acceptance Test Plan (FATP), which will test the features and functions of the installed equipment and/or software in order to verify that the solution operates according to its design. This plan will validate that EBRCSA's solution will operate according to its design, and increase the efficiency and accuracy of the final installation activities.

A detailed FATP will be developed and finalized during the Design Review.

2.4 TRAINING

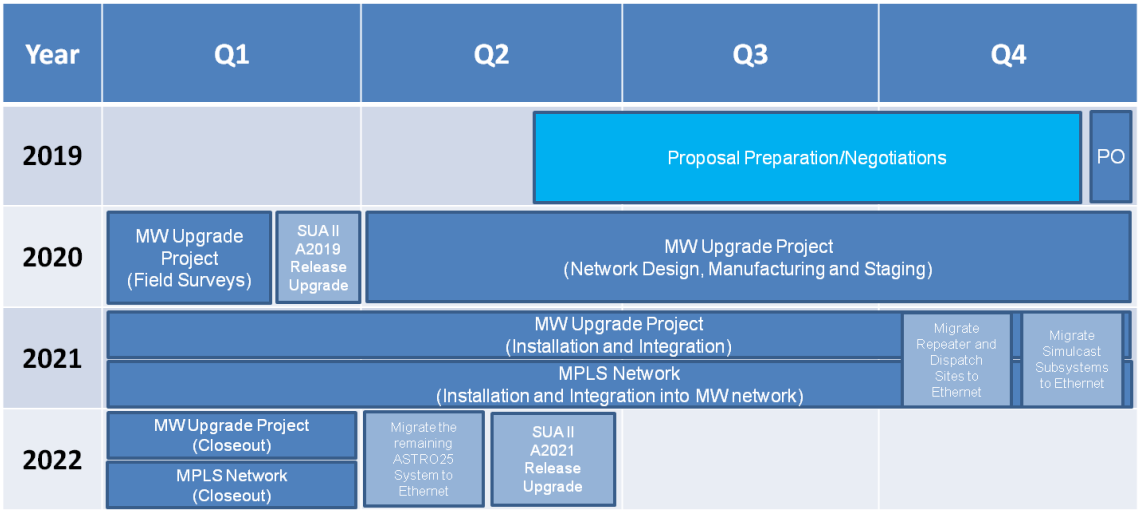
Motorola has included the following customer training for the new MW solution:

Course Title	Sessions	Duration	Location	Date	Participants
Eclipse and ProVision Training	1	5 days	TBD	TBD	10

2.5 PROJECT SCHEDULE

The EBRCS Backhaul Network upgrade project would require a carefully developed deployment plan, keeping in mind the importance of continuous operations of the current network. Motorola has prepared a preliminary multi-year deployment plan designed to avoid network operations challenges by taking smaller and controlled upgrade steps.

The estimated time for completion of the entire upgrade project is approximately 24-27 months from the date of Contract signature (a high level project timeline is shown on the diagram below). A more detailed project schedule version will be prepared by the Motorola's assigned Project Manager during the Detailed Design Review, and then reviewed and approved by EBRCSA.



2.5.1 Microwave Cutover Plan

Motorola has put special emphasis on the Microwave cutover methodology, keeping in mind the importance of continuous operations of the current network:

- The cutover will be at DS-1 and Ethernet Level starting at middle of ring and working way out with hop by hop replacement. Crews are needed at both ends of hop during the cutover to minimize the downtime.
- The cutover will be executed in different phases to allow the customer to implement the network over the project lifecycle.
- It is recommended to complete one ring at the time with the following sequence: CCCO ring, ALCO and Richmond Mini loop. The loop protection will not be available when working on each loop until each individual loop is completed with new radio replacement.
- The spur hops can be done after loops are completed.

A detailed cutover plan will be developed once the field site survey is completed (post contract award).

2.6 WARRANTY SERVICES

2.6.1 Microwave Equipment

Motorola will pass through to EBRCSA the Aviat standard hardware repair warranty for a period of 3 Years from the shipment date.

2.6.2 MPLS Equipment

Motorola will pass through to EBRCSA the Nokia standard hardware repair warranty for a period of 1 Year from the shipment date.

SECTION 3

PRICING

Motorola is pleased to provide the following equipment and services to EBRCSA:

3.1 MW UPGRADE AND MPLS IMPLEMENTATION

Description	Price (USD)
Equipment	
MW Equipment	$4,266,656
MPLS Equipment	$1,013,790
Equipment Subtotal	**$5,280,446**
Equipment Discount - Contract Level	*-$792,941*
Equipment Total (after Contract Discount)	**$4,487,505**
System Integration Services	**$4,570,889**
Project Total	**$9,058,394**
One Time System Discount (for Contract by December 14th, 2019)	*-$858,394*
Estimated **Sales Tax** on Equipment (9.25%)	$375,759
Project Total (with all Discounts and Tax)	**$8,575,759**

3.2 MUNICIPAL LEASE FINANCING OPTIONS

Motorola is proposing the following options to EBRCSA for municipal lease financing:

- 3 Years → $3,008,880 per year
- 5 Years → $1,852,371 per year
- 7 Years → $1,353,834 per year

The first payment is scheduled one year after lease execution.

3.3 LIFECYCLE SERVICES (OPTIONAL)

Lifecycle Maintenance and Support Services can be proposed at EBRCSA's request.

SECTION 4

CONTRACTUAL DOCUMENTATION

This proposal is based upon providing the project under a Change Order to the Communications System Agreement (CSA) between EBRCSA and Motorola, dated July 7, 2009, extended on July 6, 2012, and extended again on July 6, 2017 through July 6, 2020.

East Bay Regional Communications System Authority ("EBRCSA") ***Prepared: 10/28/2020***

Tax Exempt Financing Structure
Equipment Lease Purchase Agreement
FOR BUDGETARY PURPOSES ONLY

New Project:	$ 8,575,759.00
Refinance:	$ 3,242,200.00
TOTAL	**$11,817,959.00**

Compound Period: Annual
Nominal Annual Rate: 1.77% ***
CASH FLOW DATA

	Event	Date	Amount	Number	Period	End Date
1	Loan	12/15/2020	11,817,959.00	1		
2	Payment	12/1/2021	1,663,030.00	2	Annual	12/1/2022
3	Payment	12/1/2023	1,871,240.00	5	Annual	12/1/2027

AMORTIZATION SCHEDULE - Normal Amortization, 360 Day Year

	Date	Payment	Interest	Principal	Balance
Loan	12/15/2020				11,817,959.00
1	12/1/2021	1,663,030.00	203,948.61	1,459,081.39	10,358,877.61
2	12/1/2022	1,663,030.00	183,352.30	1,479,677.70	8,879,199.91
3	12/1/2023	1,871,240.00	157,161.98	1,714,078.02	7,165,121.89
4	12/1/2024	1,871,240.00	126,822.77	1,744,417.23	5,420,704.66
5	12/1/2025	1,871,240.00	95,946.56	1,775,293.44	3,645,411.22
6	12/1/2026	1,871,240.00	64,523.84	1,806,716.16	1,838,695.06
7	12/1/2027	1,871,240.00	32,544.94	1,838,695.06	0.00
Grand Totals		12,682,260.00	864,301.00	11,817,959.00	

*** Please note this special financing offer is being subsidized by Motorola Corporate to the bank and such subsidy is limited, subject to change, including elimination, and is only available for financed transactions.

Lease Purchase Program Characteristics:

Equipment title passes to Lessee upon shipment
Lessee owns the equipment; Lessor takes a security interest in the equipment through the term
Risk of Loss is for the account of the Lessee
Personal property, sales, leasing, use, stamp, or other taxes are for the account of the Lessee

Qualifications:

The interest portion of the Lease Payments shall be excludable from the Lessor's gross income pursuant to Section 103 of the Internal Revenue Code.

All is subject to Lessor's completion of its due diligence, final credit approval, market conditions at the time of funding, and mutually acceptable documentation

For questions concerning this table, please contact:

Paul Mecaskey
Mgr, Customer Financing
Motorola Solutions Credit Company LLC
847-538-3707
pjm@motorolasolutions.com

Ten-Year Microwave Upgrade Agreement

East Bay Regional Communication System

Release 3.1

September 2, 2020

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TEN-YEAR MICROWAVE UPGRADE AGREEMENT

This Ten-Year Microwave Upgrade Agreement ("MUA") is hereby presented by Aviat US for consideration by the East Bay Regional Communications System ("EBRCS"). The intent of this proposal is to provide EBRCS with the option of purchasing an MUA package designed to keep its microwave network operating at peak performance with the latest equipment and technology upgrades available throughout the duration of the contract.

1. OVERVIEW

Aviat US is pleased to present this ten-year MUA for the EBRCS microwave system. We understand EBRCS's biggest challenges: existing microwave system nearing technology obsolescence, funding approval bureaucracy, and identifying reliable long-term support. Our proposal addresses an end-to-end solution ensuring an up-to-date microwave system, maintaining high reliability, and detailed cost benefit analysis.

Identified negative impacts occurring by obsolete technology:

1. Inability to support the business and end users
2. Security vulnerabilities
3. Network downtime
4. Poor performance
5. High variable cost
6. Lack of skills and support from vendors
7. Higher OPEX and complex sparing
8. Compliance issues

The solution to these negative impacts is Aviat's Microwave Upgrade Agreement which consists of the AviatCare Lifecycle Support Package and the Advanced Technology Package ("ATP").

AVIATCARE LIFECYCLE SUPPORT PROVIDES:

- **Less Downtime:** Ensuring the microwave network has the latest hardware, software, features and the lowest probability of failures. Decreasing interoperability and security vulnerabilities, AviatCare Lifecycle Support optimizes uptime and network stability. Additionally, full 24/7 support plays a huge role in ensuring the microwave network runs smoothly.

- **Better Performance:** Having access to the latest capacity, security, reliability and interoperability features ensures the Customer's microwave network performs optimally. The microwave network can keep up with the growing demands for more data at greater overall network uptime.

- **Lower/Fixed Costs:** With this solution, the customer receives financial and operational stability to focus on its critical mission of safety throughout the region. That means budgeting for long-range support over the entire time span of the network's operational life and providing all required maintenance, and sustainment of the network. And it means full protection against technology obsolescence. New funding is seldom available when upgrades are required or desirable, so AviatCare Lifecycle Support offers stability without surprise add-on expenses.

ADVANCED TECHNOLOGY PACKAGE:

To keep EBRCS's microwave system up to date, Aviat US includes a complete package of hardware, software and implementation services to update EBRCS's microwave system regularly to a level consistent with the latest systems leaving the factory. This service includes planning, scheduling, and managing the installation of the radios, routers and software, including technical assistance, network engineering, and project management.

The following table (1.1) illustrates the various Lifecycle and ATP components provided under this MUA:

Table 1.1

AVIAT LIFECYCLE SERVICES	MUA
24 x 7 x 365 Technical Support	✓
24 x 7 x 365 Software Access & Install	✓
Hardware Repair	✓
Advance Replacement	✓
Repair Logistics	✓
Remote Monitoring	*Optional*
Ground Corrective Maintenance	*Optional*
Ground Preventive Maintenance	*Optional*
ADVANCED TECHNOLOGY PACKAGE	✓
Network HW & Technology Upgrades	✓
RF HW & Technology Upgrades	✓
Project Management	✓
Design & Network Eng	✓
Installation & Integration	✓
Frequency Assurance Service	✓
Testing & Optimization	✓
Training	✓

2. ESTIMATED COST ANALYSIS BENEFITS

The following is a listing of the estimated and potential savings that could be realized by the East Bay Regional Communications System under this MUA:

1. One-Time Management Discount: $1,826,091.00

2. Estimated Savings on the Services Provided for all RF & Networking Upgrades: $227,633.00

3. Estimated Savings on Equipment provided for all RF & Networking Upgrades: $1,628,000.00

TOTAL ESTIMATED SAVINGS: $3,681,724.00

3. PAYMENT PLAN

The total amount for this contract is **$7,846,354.00 (Seven Million, Eight Hundred Forty-Six Thousand, Three Hundred and Fifty-Four Dollars).**

$1,200,000 (One Million, Two Eight Hundred Thousand Dollars) per year shall be due for the first three (3) years, and thereafter $606,622 (Six Hundred Six Thousand and Six Hundred Twenty-Two Dollars) per year for the remaining seven (7) years, shall be due annually in advance from the Effective Date of this Contract.

YEAR	PAYMENT
1	$1,200,000
2	$1,200,000
3	$1,200,000
4	$606,622
5	$606,622
6	$606,622
7	$606,622
8	$606,622
9	$606,622
10	$606,622
TOTAL	**$7,846,354**

OPTIONAL SERVICES:

Remote Network Monitoring:	Additional **$163,100/yr**
Ground Corrective Maintenance:	Additional **$36,879/yr**
Ground Preventative Maintenance:	Additional **$90,661/yr**

Service Descriptions:

Remote Network Monitoring

Network Operations Center (NOC) Technologists provide 24x7x365 event monitoring, first echelon diagnostic troubleshooting, and dispatch of field technical resources.

Annual Ground Preventive Maintenance

Provides an operational assessment and documentation of network components to ensure equipment meets original manufacturer's specifications. Performed once annually per site.

Onsite Ground Corrective Maintenance

Provides Aviat Networks resources to provide onsite technical response within 4 hours of dispatch for critical failures. 2-hour response is available for select metropolitan areas. A total of 24 dispatches per year are available under this MUA.

3.1 PRICING BREAKDOWN

AVIAT 10 YEAR MUA COST BREAKDOWN - 60 HOPS	
Description	**Total**
Hardware (Radios, Routers, & Antennas) & Installation & Engineering Services **New Antenna Systems just for 9 Hops*	$6,387,863
10 Year Warranty (Radios, Router, Misc)	$916,502
Freight	$64,992
Tax, Estimate at 9.5%	$476,999
Total MUA service for 10 years (Excluding NOC, CM & PM)	**$7,846,356**
OPTIONAL SERVICES	
Remote Network Monitoring	$1,631,000
Ground Corrective Maintenance	$368,790
Ground Preventative Maintenance	$906,610
SUB-TOTAL OPTIONAL SERVICES	**$2,906,400**

3.2 AVIAT 10 YEAR MUA BREAKDOWN

2020 / Existing Network	**Total Hops 60 (28 loop hops, 32 spur hops).** **51 hops of TRuepoint (loop and spurs),** **5 hops of ODU 300-IRU 600v2 (spurs),** **3 hops IRUv2, 1 hop IRUv3 (spurs).**
YR-1	RF & Networking Upgrade - Alameda Co loop (14 hops) & spurs (19) with Eclipse IRUv4 INUe's & Next Gen MPLS Routers. Update Provision, spares. Replace antennas on 6 spur hops.
YR-2	RF & Networking Upgrade - Contra Costa and Richmond Loop (14 hops) & spurs (13 hops) with Eclipse IRUv4 INUe's & Next Gen Routers. Replace antennas on 3 spurs hops.
YR-3	TDM to IP migration, remove existing TDM equipment (DS1 cards and jackfields only), plus latest Software Upgrade for final acceptance.
YR-4	System Engineering Support (12 days NDE and 12 days Field Engineering Support)
YR-5	System Engineering Support (12 days NDE and 12 days Field Engineering Support)

➔ Continued next page…

2020 / Existing Network	**Total Hops 60 (28 loop hops, 32 spur hops)** **51 hops of Truepoint (loop and spurs)** **5 hops of ODU 300-IRU 600v2 (spurs)** **3 hops IRUv2, 1 hop IRUv3 (spurs)**
YR-6	System Engineering Support (12 days NDE and 12 days Field Engineering Support)
YR-7	System Engineering Support (12 days NDE and 12 days Field Engineering Support)
YR-8	System Engineering Support (12 days NDE and 12 days Field Engineering Support)
YR-9	System Engineering Support (12 days NDE and 12 days Field Engineering Support)
YR-10	System Engineering Support (12 days NDE and 12 days Field Engineering Support)

4. STATEMENT OF WORK

This MUA Scope of Work assumes the following starting point for the microwave network:

- 60 total existing microwave hops
- 28 loop hops, 32 spur hops
- 51 hops of TRuepoint radios
- 5 hops of ODU300-IRU600v2, 3 hops of IRU600v2, 1 hop of IRU600v3

The ten-year MUA program includes the following work for the EBRCS microwave system. Aviat US proposes to start the field implementation of this MUA on January 1, 2021 and complete it by December 31, 2030 as summarized in table 4.1 below.

Table 4.1

OFFERING	YEAR									
AVIAT LIFECYCLE SERVICES	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
24 x 7 x 365 Technical Support	X	X	X	X	X	X	X	X	X	X
24 x 7 x 365 Software Access	X	X	X	X	X	X	X	X	X	X
Field Software Install	-	-	X	-	-	-	-	-	-	-
Hardware Repair	X	X	X	X	X	X	X	X	X	X
Advance Replacement	X	X	X	X	X	X	X	X	X	X
Repair Logistics	X	X	X	X	X	X	X	X	X	X
Remote Monitoring (Optional)	X	X	X	X	X	X	X	X	X	X
Ground Corrective Maintenance (Optional)	X	X	X	X	X	X	X	X	X	X
Ground Preventive Maintenance (Optional)	X	X	X	X	X	X	X	X	X	X
ADVANCED TECHNOLOGY PACKAGE	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Network HW & Technology Upgrades	X	X	X	-	-	-	-	-	-	-
RF HW & Technology Upgrades	X	X	-	-	-	-	-	-	-	-
OEM (Antennas)	X	X	-	-	-	-	-	-	-	-
Project Management	X	X	X	X	X	X	X	X	X	X
Design & Network Eng	X	X	X	X	X	X	X	X	X	X
Installation & Integration	X	X	X	-	-	-	-	-	-	-
Frequency Assurance Service	X	X	X	X	X	X	X	X	X	X
Training	X	X	-	-	-	-	-	-	-	-
Testing & Optimization	X	X	X	-	-	-	-	-	-	-

Aviat US will furnish the equipment, materials and services ("Services") outlined in this MUA as may be required from time to time for the period specified in the Contract. The Services will be provided in conformity with the terms, conditions, specifications and other requirements of this Contract, and each request for Services will be governed by the terms and conditions stated in this Contract.

This MUA covers only the Aviat US Products which are enrolled at the start of the Contract or added periodically as part of the MUA equipment upgrades covered by this MUA. This MUA however does not apply to any non-Aviat US products which are not enrolled at the start of this MUA. Such products may be added to this MUA and purchased under a separate contract/agreement by EBRCS.

YEARS 1-10:

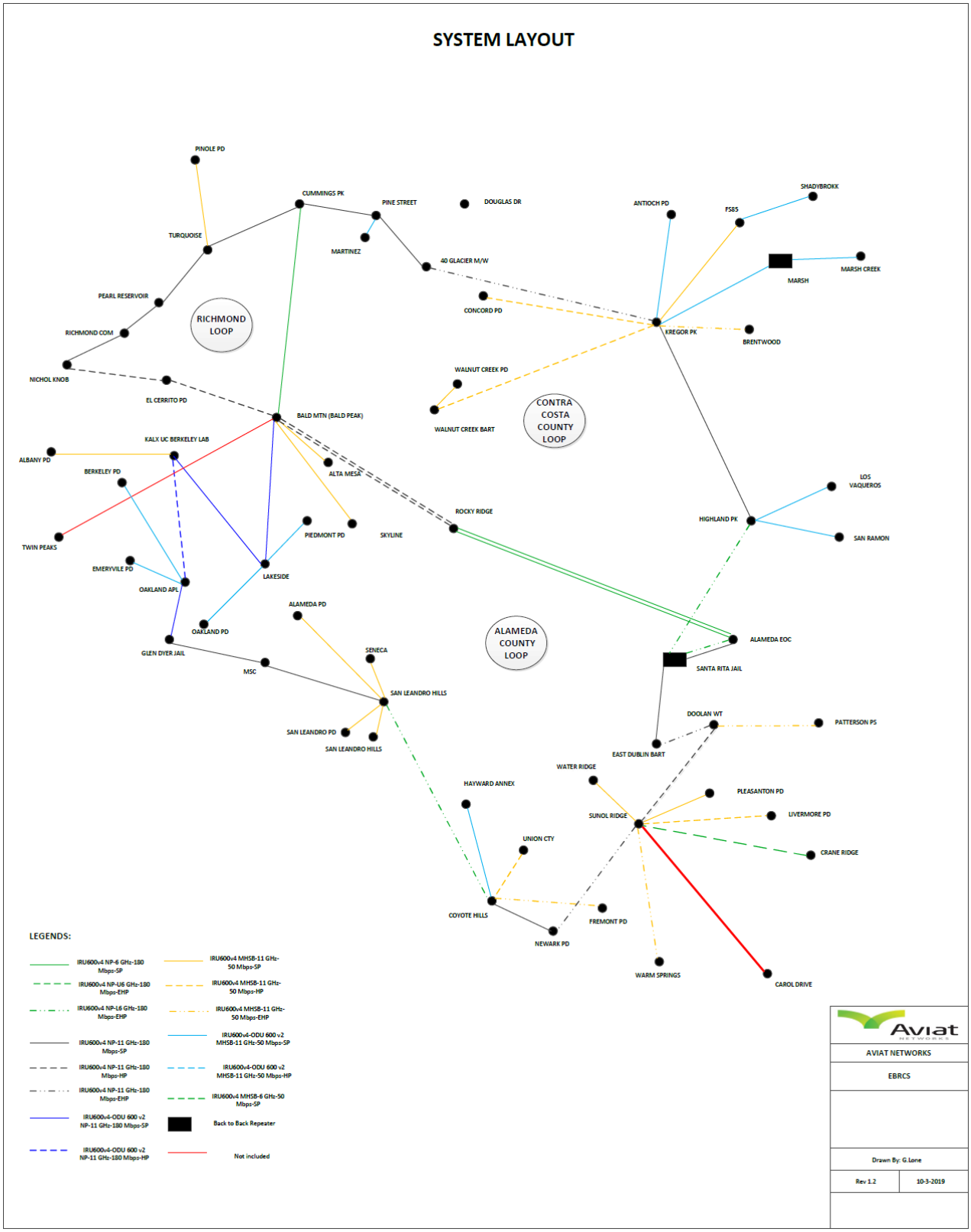
The program starts by providing Lifecycle Support Services throughout all ten years of this agreement including 24x7x365 Technical Support, Software Access, Advanced Replacement, Hardware Repair with logistics, Frequency Assurance Service (FAS) and optional Remote Monitoring, Preventative and Corrective Maintenance.

Aviat US will work side by side with EBRCS to develop the migration plan of the legacy traffic to IP/MPLS, routing upgrades and optimization, and improved RF bandwidth and reliability. Once the migration plan is in place, program management and field support will be provided for the implementation. The migration plan will consider the least outage time to ensure EBRCS's end users will have minimal impact by the migration.

Frequency Assurance Services (FAS) will begin upon contract signature and NTP. This agreement does include Frequency Coordination, PCN's or FCC license application costs.

For reference, the following diagram shows the network topology with all the hops. Please note that microwave hops Carol Drive to Sunol Ridge and Bald Mtn to Twin Peak are not included in this proposal.

Fig 4.1 Network Topology



Year 1: RF & Networking Upgrade - Alameda County Loop and Spurs

The Alameda County microwave system consists of 14 hops of Non-Protected (NP) TRuepoint radios on the loop and 19 hops of Protected (MHSB) TRuepoint radios, ODU300 radios and IRU600v2 radios on spurs. In this first year of the MUA, Aviat proposes to replace a total of 33 hops, loop and spurs, with Eclipse radios, INUe as Indoor unit and CTR 8740 as MPLS router.

The following is a summary of system design activities for year 1:

Aviat will deploy two (2) Network Integrators (NIs) to install and test Aviat provided hardware on a hop by hop basis and replace the existing radios on all loop and spur hops. A maintenance widow is needed during the cutover.

- Total of 33 hops are included in this year.
- Replace the existing TRuepoint radios, ODU300 radios and IRU600v2 radios with Eclipse IRU600v4/ODU600v2 radios and INUe. The Eclipse INUe's are equipped with RAC cards, DS1 cards (to drop 16 DS1), NCM cards to do loop protection and DAC GE3 cards.
- For redundancy, Aviat's design includes separate INUe facing each direction on the loop, protected DS1 and Loop switch cards.
- Install two preconfigured CTR 8740's on each site to perform MPLS loop protection. Two CTR Routers are proposed to achieved hardware redundancy so there is no single point for failure.
- Install Provision and Provision Plus to monitor the newly installed equipment. The existing radios are currently being monitored using NetBoss and are not added to the new monitoring system.
- It is assumed that there is SNMP connectivity to all the radios. The monitoring and replacement of existing RTU's (Site Boss) is not included in this proposal
- Please note that all equipment would be pre-configured at the Aviat facility in Austin ahead of shipment to the field.
- All T1 and ethernet circuits needs to be finalized so they can be preprogrammed.
- Install New Antenna Systems for 6 of the spur hops (12 total antennas) that need to move to the 11 GHz frequency band.

Below are the hops included in Year-1:

1	BALD MTN (BALD PEAK)	LAKESIDE
2	BALD MTN (BALD PEAK)	ROCKY RIDGE
3	COYOTE HILLS	NEWARK PD
4	DOOLAN WT	EAST DUBLIN BART
5	EAST DUBLIN BART	ALAMEDA EOC
6	GLEN DYER JAIL	MSC
7	LAKESIDE	LAW BERK LAB
8	LAW BERK LAB	OAKLAND APL
9	MSC	SAN LEANDRO HILLS
10	NEWARK PD	SUNOL RIDGE

11	OAKLAND APL	GLEN DYER JAIL
12	ROCKY RIDGE	ALAMEDA EOC
13	SAN LEANDRO HILLS	COYOTE HILLS
14	SUNOL RIDGE	DOOLAN WT
15	BALD MTN (BALD PEAK)	SKYLINE
16	LAKESIDE	OAKLAND PD
17	LAKESIDE	PIEDMONT PD
18	LAW BERK LAB	ALBANY PD
19	OAKLAND APL	BERKELEY PD
20	OAKLAND APL	EMERYVILLE FD
21	SAN LEANDRO HILLS	ALAMEDA PD
22	SAN LEANDRO HILLS	SAN LEANDRO PD
23	SAN LEANDRO HILLS	SAN LEANDRO COMM
24	SAN LEANDRO HILLS	SENECA
25	COYOTE HILLS	HAYWARD ANNEX
26	COYOTE HILLS	UNION CITY
27	COYOTE HILLS	FREMONT PD
28	SUNOL RIDGE	WALPERT RIDG
29	SUNOL RIDGE	PLEASANTON PD
30	SUNOL RIDGE	LIVERMORE PD
31	SUNOL RIDGE	WARM SPRING
32	SUNOL RIDGE	CRANE RIDGE
33	DOOLAN WT	PATTERSON PASS

Year 2: RF & Networking Upgrade - Contra Costa County and Richmond Loop and Spurs

The Contra Costa County and Richmond microwave systems consist of 14 hops of Non-Protected (NP) TRuepoint radios on loop and 13 hops of Protected (MHSB) TRuepoint radios, ODU300 radios, IRU6020v2 and IRU600v3 on spurs. Similar to year 1, Aviat proposes to replace a total of 27 hops, loop and spurs, with Eclipse radios, INUe as Indoor unit and CTR 8740 as MPLS router.

The following is a summary of system design activities for year 2:

Aviat will deploy two (2) Network Integrators (NIs) to install and test Aviat provided hardware on a hop by hop basis and replace the existing radios on all loop hops. A maintenance widow is needed during the cutover.

- Total of 27 hops are included in this year.
- Replace the Non-Protected TRuepoint radios with Eclipse IRU600v4/ODU600v2 radios and INUe. The Eclipse INUe's are equipped with RAC cards, DS1 cards (to drop 16 DS1), NCM cards to do loop protection and DAC GE3 cards.
- For redundancy, Aviat's design includes separate INUe's facing each direction on the loop, protected DS1 and Loop switch cards.

- Install two preconfigured CTR 8740's on each site to perform MPLS loop protection. Two CTR routers are proposed to achieved hardware redundancy so there is no single point for failure.
- All the T1 and ethernet circuits needs to be finalized so they can be preprogrammed.
- Install New Antenna Systems for 3 of the spur hops (6 total antennas) that need to move to the 11 GHz frequency band.
- Update Provision and Provision Plus to monitor the newly installed equipment.

Below are the hops included in year 2:

1	40 GLACIER M/W	PINE STREET
2	BALD MTN (BALD PEAK)	CUMMINGS PEAK
3	BALD MTN (BALD PEAK)	ROCKY RIDGE
4	CUMMINGS PEAK	TURQUOISE
5	EL CERRITO PD	BALD MTN (BALD PEAK)
6	HIGHLAND PEAK	KREGOR PK 2
7	HIGHLAND PEAK	ALAMEDA EOC
8	KREGOR PEAK	40 GLACIER M/W
9	NICHOL KNOB	EL CERRITO PD
10	PEARL RESERVOIR	RICHMOND COM
11	PINE STREET	CUMMINGS PEAK
12	RICHMOND COM	NICHOL KNOB
13	ROCKY RIDGE	ALAMEDA EOC
14	TURQUOISE	PEARL RESERVOIR
15	HIGHLAND PEAK	SAN RAMON
16	HIGHLAND PEAK	LOS VAQUEROS
17	KREGOR PEAK	FS85 STONEMAN
18	KREGOR PEAK	WALNUT CREEK BART
19	KREGOR PEAK	CONCORD PD
20	KREGOR PEAK	ANTIOCH PD
21	KREGOR PEAK	MARSH CREEK
22	KREGOR PEAK	BRENTWOOD PD
23	PINE STREET	MARTINEZ
24	BALD MTN (BALD PEAK)	ALTA MESA
25	FS85 STONEMAN	SHADYBROOK
26	WALNUT CREEK BART	WALNUT CREEK PD
27	TURQUOISE	PINOLE PD

Year 3: TDM to IP Migration

At the start of this phase traffic on all the T1 circuits is already migrated to Ethernet on IP-MPLS routers. Aviat proposes to remove the T1 circuits and all DS1 cards and Jack fields. Removal of existing channel banks or other T1 equipment's is not included in Aviat's proposal.

At the end of this year Aviat would make sure all the new equipment's proposed in year 1 and 2 has most updated software.

5. FIELD IMPLEMENTATION

The Aviat Project Engineer will develop a Method of Procedure (MOP) on a hop by hop basis to provide detailed guidance on the microwave upgrade. Additionally, the Network Management System (NMS) software will be upgraded if needed and all new elements will be programmed into it for complete system visibility and monitoring.

Aviat proposes to start the field implementation of the MUA on June 20, 2020 and complete it by June 20, 2030.

All decommissioned radios will be transported to EBRCS's warehouse.

6. ANTENNAS & ADDITIONAL SITES

As addressed in section-4 (Statement of Work), antenna replacements for 9 hops will take place in years 1, and 2 of this MUA program. Additional sites, however, that may be required due to design, technology upgrades, capacity requirements, or other activities associated with performing work under this agreement, are not covered under this agreement. Moreover, antenna upgrades for any additional sites deployed outside of this MUA scope are also not included. Any such additional scope shall be billed separately through a change order should EBRCS desire for Aviat to perform such work.

7. LIFECYCLE OFFERING

LIFECYCLE OFFERING	DESCRIPTION
24x7x365 Technical Support	Priority customer PIN access to Aviat's Technical Assistance Center (TAC) Technologists.
Software Access & Self Install	Customers are provided an AviatCloud account where they can access software downloads associated with their current service contracts. ProVision access requires a separate ProVision support contract.
Hardware Repair / Logistics	Quick turn OEM factory repair and cross shipping replacement. Aviat pays for shipping to and from Aviat's North American repair Center.
Advance Replacement	Provides for Advance Replacement of equipment under Aviat's Warranty Plus service contracts. SLA commitments guarantee delivery within 3-5 business days of request.
Remote Network Monitoring (Optional)	Network Operations Center (NOC) Technologists provide 24x7x365 event monitoring, first echelon diagnostic troubleshooting, and dispatch of field technical resources.
Annual Ground Preventive Maintenance (Optional)	Provides an operational assessment and documentation of network components to ensure equipment meets original manufacturer's specifications. Performed once annually per site.
Onsite Ground Corrective Maintenance (Optional)	Provides Aviat Networks resources to provide onsite technical response within 4 hours of dispatch for critical failures. 2-hour response is available for select metropolitan areas. A total of 24 dispatches per year are available under this MUA.

8. ADVANCED TECHNOLOGY OFFERING

The advanced technology offering includes equipment & technology upgrades along with all associated Services for both the RF and Networking systems of the Microwave Network. The details of this comprehensive upgrade can be found in section-4, Statement of Work, which provides a year-by-year account of the various upgrade activities.

8.1 NETWORK HW & TECHNOLOGY UPGRADES

This upgrade is specific to the Networking/IP part of the Microwave network and may include the addition of MPLS routers and functionality, Segment Routing, SDN features and NMS upgrades amongst others. Please refer to section-4, Statement of Work, for details of this offering and its implementation.

8.2 RF HW & TECHNOLOGY UPGRADES

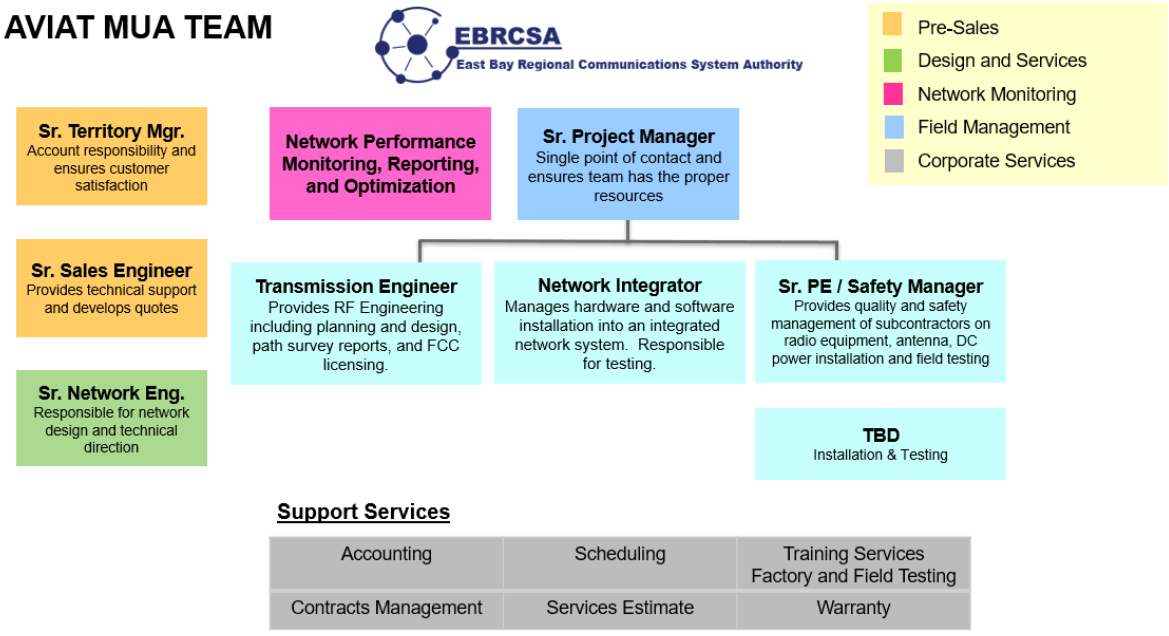
This upgrade is specific to the RF part of the Microwave network and includes one or more upgrades to the radios, additional capacity, modem cards, modulation levels, bandwidth increase and improved reliability. Please refer to section-4, Statement of Work, for details of this offering and its implementation.

8.3 FREQUENCY ASSURANCE SERVICE (FAS)

FAS is a patent-pending expert system designed to protect Aviat's customers from pending Wi-Fi 6e deployments in 6 GHz bands. FAS uses software integrated into ProVision Plus to monitor and report interference and to help ensure microwave links are not impacted. FAS helps prevent outages before they become real problems, and helps customers baseline their networks before they get interfered with. FAS includes the following services:

- *Interference analysis and alarms*
- *Interference trends by network/link*
- *Detailed Executive reports including Paperless Chart Recorder (PCR) integrated into FAS app for further analysis*

8.4 PROJECT MANAGEMENT



Aviat Networks will assign an Aviat representative to be the primary point of contact ("Project Manager") for this MUA. The Project Manager will work with EBRCS to facilitate effective resource management, escalations, approval processes, scheduling, communication, and reporting with Aviat engineers and other designated vendors as needed. The Project Manager is responsible for maintaining control of the project and assuring compliance with the project and EBRCS's specifications. Aviat Networks will not be responsible for the resolution of EBRCS vendor issues affecting the completion of the project. Any documentation and standards not listed in this SOW will default to Aviat Networks standards, where applicable.

Although face-to-face communication and on-site meetings with EBRCS are essential elements of the service, some activities that do not require face-to-face contact will be performed in the Project Manager's Aviat Networks office in order to reduce travel and living costs. These activities are at the discretion of the Project Manager.

PROJECT SCHEDULE

The project schedule for Aviat engineers, Aviat sub-contractors, and for EBRCS's supporting vendors will be developed (or updated if a schedule is included with this proposal) and maintained in Microsoft Project and will identify project deliverables, key milestones, resource assignments, and track project progress against each milestone. EBRCS and Aviat Networks agree to collaboratively review and agree to the project milestones and deliverable dates prior to the execution of any services on the project. A copy of the project schedule will be available upon request in .pdf or .mpp format.

It will be the responsibility of EBRCS to track and deliver against all EBRCS's internal (including EBRCS sub-contractors) milestones. The overall project plan generated by the Aviat Networks Project Manager will show major deliverable milestones, but not internal milestones of EBRCS or their contractors. Tracking of EBRCS and its contractor internal milestones will remain the responsibility of EBRCS.

COMMUNICATIONS PLAN

Establishment of a communications plan will be done in accordance with the principles of project management established by the Project Management Institute (PMI®) unless otherwise agreed to. The plan will involve representatives from Aviat Networks and EBRCS and any other entities as mutually agreed between the parties for project kickoff meetings, periodic progress meetings, or problem escalations as needed. The plan will include the location and frequency of any such meetings, the format for formal communication and meeting minutes, attendee or distribution lists with contact details, methods of communication, and escalation and management level lists.

EBRCS will make appropriate staff available for regular consultation and meetings with the Aviat Networks Project Manager. EBRCS's failure to attend regular meetings or respond to Aviat Networks questions in a timely manner could result in a delay of the project deliverables and a billable change order.

CHANGE MANAGEMENT PLAN

Establishment of a change management plan will be done in accordance with the principles of project management established by the Project Management Institute (PMI®) and will include confirmation from Aviat Networks and EBRCS's understanding of the process. Each party will work closely with the other to manage any scope changes through the term of the project and understand their impact on the project performance from a cost, quality, and schedule perspective. Any such change may be subject to a change order fee and will be communicated to EBRCS prior to the implementation of the change. Any change order approvals will be submitted in writing.

QUALITY STANDARDS AND PROCEDURES

Quality standards and procedures documents will be provided by EBRCS prior to execution of this SOW. If no documentation is provided by EBRCS prior to execution of this SOW, the standards and procedures will default to Aviat Networks best practices guide.

RESOURCE MANAGEMENT PLAN

Establishment of a resource management plan will be done in accordance with the principles of project management established by the Project Management Institute (PMI®), identifying principal team members by function, including backup resources (if required).

CLOSEOUT ACTIVITIES

During the project closeout, all quality photos will be reviewed, completion documents will be signed with no exceptions, RMA completed, and final billing and invoicing released. It is recommended that

EBRCS provide Aviat Networks with performance feedback during this time to promote continuous improvement within Aviat US.

EBRCS'S RESPONSIBILITIES

EBRCS shall:

- Provide details of EBRCS's principal team members by function during the project kickoff meeting.
- Provide details of EBRCS's single point of contact for Aviat during the project kickoff meeting.
- Provide access to sites, shelters, buildings, enclosures, facilities or any other areas as required.
- Provide updates as necessary of any site readiness issues to be resolved prior to start of work.
- Provide access to pertinent databases, planning requirements, including strategic plans, expansion scenarios, growth projections, introduction of new services and wireless technology.

8.5 NETWORK ENGINEERING

MICROWAVE SYSTEM AND NETWORK DESIGN

The Aviat Networks representative who oversees the network ("Network Engineer") will provide the overall technical direction of the system design and will work with EBRCS to ensure system integrity, verify that all sub-systems and Aviat Networks furnished OEM equipment is compatible, and that the desired performance of the system is realized.

The network design portion of the project consists of two phases:

1. Final design
2. Design freeze

DESIGN FINALIZATION PHASE

After receipt of the order and the project kickoff meeting, Aviat Networks and EBRCS enter the design finalization phase. During this phase, the Network Engineer will run path calculations with the new radio hardware and software and determine if any of the hops will have to change to high power.

During this phase, EBRCS may also request changes to the system design if the changes fall within the original scope and hours of the projects. Any changes outside of the original scope or agreed schedule are subject to review and acceptance by Aviat Networks to determine the impact and cost on the overall project.

Aviat Networks will provide a formal submission detailing the final system design and equipment list and highlight changes needed to the preliminary design. EBRCS shall review the data and schedule a meeting, if necessary, to discuss any concerns. If no concerns are noted, it is EBRCS's responsibility to approve the final design in writing (email is acceptable) before the design is frozen and equipment is placed on order

(unless otherwise agreed to in this SOW or with the Project Manager). Any delay in the approval of the final design could result in a delay in material delivery to the field. This might require a review by EBRCS and Aviat Networks of the project schedule and deadlines.

DESIGN FREEZE PHASE

As part of the Design Finalization Phase, a date will be set for the design freeze at which the final design and all changes must be approved and accepted by both parties. Following the design freeze, the Bill of Materials and documentation will be submitted to Aviat's factory and the system will be scheduled for manufacturing.

The Network Engineer will concurrently review all design documents and finalize any traffic plans, NMS plans, synchronization plans, traffic cutover requirements, as well as any special factory and field acceptance testing requirements for the project. During the Design Freeze Phase, the design is frozen and no further changes to the system design will be accepted without a formal change order and reevaluation of the project and delivery schedules. Refer to the project schedule for details on the planned start and finish dates for each of these phases.

Deliverables

- The equipment list refers to the final bill of material ("BOM").
- The design freeze package refers to the final path calculations, path profiles, rack profile and system drawings, traffic plans, IP plans, NMS plans, and/or DC power calculations.

8.6 TRANSMISSION ENGINEERING

MICROWAVE PATH DESIGN

The Aviat Networks representative who oversees transmission ("Transmission Engineer") ensures the delivery of the best possible network solution by providing the technical direction for the over-the-path RF performance of Aviat Networks system implementation. This includes path calculations and profiles.

MICROWAVE FREQUENCY PLANNING AND LICENSING

This shall include the following services:

- Perform frequency coordination based on available FCC records to reduce the potential for interference between internal or external radio sources on a given system or network.
- Aviat Networks, upon receipt of EBRCS's authorization, will prepare the FCC License Application Form 601 with the appropriate technical data. Information such as site location, radio type, and frequency will be listed. Aviat Networks will complete and submit the Construction Complete Form 601 online via FCC Universal Licensing System ("ULS").
- File Antenna Structure Registration ("ASR") form for towers over 200 feet.

MICROWAVE PATH PERFORMANCE CALCULATIONS AND WARRANTIES

The microwave path design models most frequently employed within the industry (e.g., Vigants, and ITU-R P-530) provide a reasonably accurate (and therefore usually guaranteed) estimate of the cumulative time a path will be out of service due to random atmospheric multipath fading under normal atmospheric conditions. These models do not (and cannot) accommodate abnormal, unusual, anomalous, or otherwise unpredictable conditions of weather or atmospheric refractivity.

MICROWAVE FREQUENCY ENGINEERING/INTER-SYSTEM INTERFERENCE ANALYSIS

Aviat Networks will partner with Comsearch, a CommScope company, to provide cost-effective frequency planning and FCC licensing services for radio communications systems (if required). The planning software used considers specific operating parameters of both the proposed microwave system and the environment microwave systems (license and proposed) to properly consider the interference potential of the new path or system. Parameters and data elements incorporated into the modeling include, but are not limited to:

- Antenna type, antenna height, elevation, antenna radiation pattern
- Receiver filter performance
- Terrain
- Radio modulation
- Path orientation
- Receiver threshold

These elements are required to accurately predict specific interfering levels into and from the existing microwave systems. The accuracy of the calculations is ensured by real-time maintenance of the Comsearch point-to-point microwave, earth station, radio equipment, antenna, interference objective, and contact database.

MICROWAVE FREQUENCY SELECTION

The interference analysis performed on the microwave system identifies available frequencies considering existing and proposed systems found in the Comsearch database. When applicable, an analysis of the systems in the adjacent bands can be done to ensure the microwave system does not receive unwanted threshold degradation. In bands shared with satellite systems, an analysis of potential interference with earth stations and with the geo-stationary satellite orbit can also be done. Additionally, co-located or nearby transmitters already licensed in the required frequency band can be identified in order to reduce the possibility of “bucking” an existing high/low frequency plan that could increase the possibility of receiver overload or reflective interference from a nearby system.

MICROWAVE FREQUENCY COORDINATION AND FCC LICENSING

The majority of microwave bands subject to FCC Rule Part 101 require prior coordination with existing licensees. Aviat Networks will partner with Comsearch to perform the frequency coordination and FCC licensing on behalf of the Customer (if required). The procedure will include notification of the technical

parameters of the proposed system to all existing and proposed licensees in the area and frequency band of operation. Frequency coordination will also be performed with Canadian and Mexican authorities in border areas when necessary. By FCC rule, recipients are given 30 days to respond, or in some cases an expedited response can be requested.

Upon completion of the prior coordination process, documentation required to satisfy FCC Rule Part 101.103 (d) can be prepared on behalf of EBRCS. This will include any necessary exhibits, including supplemental showings required upon submittal of the requested license application. The FCC filing process includes:

- Filing of the FCC Form 601 microwave application upon written approval from EBRCS and providing an electronic copy of the application to EBRCS via email.
- Tracking the status of the application until the license is granted by the FCC. Amendments will be handled expeditiously on behalf of EBRCS for any questions or concerns from the FCC.
- Email notifications to the licensee when the license is granted by the FCC.
- Filing of the required completion of construction notification with the FCC upon written approval from the licensee and notification of the filing via email.

SPECIAL CONSIDERATIONS

On all microwave radio paths traversing urban areas there exists the possibility of multiple on- and off-path structural reflections which generate long-delayed echoes, as well as terrain scatter RF intra- and inter-system interference. Long delayed, low-level echoes have no effect on digital radio performance; however, the terrain scatter mechanism cannot be accurately predicted nor precisely measured without an extensive and expensive field trial. Consequently, this mechanism is specifically excluded from all current industry-wide path survey and frequency coordination performance guarantees.

The structure supporting the microwave antenna can take many forms. The antenna is most often mounted on a tower but can be mounted on a variety of structures such as roof tripods, penthouse wall, wooden telephone pole, or metal monopole. It is recommended that EBRCS conduct a structural analysis of the support structure to determine if the structure will support the additional loading imposed by the antenna and its mount. The structure must also meet the twist and sway requirements per EIA/ANSI 222G.

FCC RULES FOR FILING ACCURACY

CFR 47, Part 1.929 specifies that filing accuracy for site coordinates shall be (+/-) 1” latitude and longitude, and for ground elevation (+/-) 1 meter (3.28 ft.). Part 1.929(k) (covering modification of FCC licenses) specifies that any change in site coordinates >5” latitude or longitude shall require prior authorization and re-coordination. Therefore, wherever our survey results deviate more than (+/-) 5” latitude or longitude, or more than +3.28 ft. site elevation, frequency re-coordination will be recommended.

8.7 PROJECT ENGINEERING

FIELD INSTALLATION MANAGEMENT

Aviat Networks will manage the day-to-day activities of the field installation with support from EBRCS to ensure the project remains on schedule as per the agreed project schedule.

Aviat project engineer is responsible for developing the installation specification to guide the field network integrator on a step by step basis to perform the radio and software upgrades. The installation specification contains installation checklists, radio site and hop test data sheets, rack profile, and wiring diagrams. The project engineer is also responsible for working with the field network integrators to ensure the project is progressing per the mutually agreed upon schedule and provides assistance to remove any roadblocks encountered during the field implementation phase.

Closeout package is completed and delivered to EBRCS at the conclusion of all field activities.

8.8 INSTALLATION, INTEGRATION & TESTING

The installation, integration, and testing services include design-supported methodologies, product expertise, and field-proven processes to help ensure a quality installation and testing of critical system paths and hardware so that the network performs according to its design. Aviat Networks will designate a primary point of contact to answer any of EBRCS's questions, provide guidance, and address issues specific to this service.

This SOW is based on an Aviat Networks standard installation schedule of 8-hour days, 5 days per week. Aviat Networks will adjust this SOW for work week schedules outside of Aviat Networks' standard. All work will be done in accordance with Aviat Networks' best practices guide.

SCOPE

Delivery of this service will utilize the design documentation developed as part of the planning and design phase. Field crews will utilize this documentation to:

- Replacement of indoor microwave radios
- Upgrade of radio and NMS software
- Perform system integration
- Perform system testing

System implementation is predicated upon complete site readiness. ***It is recommended that*** EBRCS ***provide maintenance technicians during any service affecting work***.

The successful completion of all MUA technology and equipment upgrades is based on uninterrupted, contiguous-site installation and testing. Additional mobilizations are not included in the pricing and

project schedule. If installation is delayed due to inclement weather, inaccessible site(s), incomplete site preparation, or construction, the following charges may apply and will be billed to EBRCS as a billable change order:

- Standby time for radio teams will be charged at a rate of $1,245 per person per day.
- If re-mobilization of the installation crew is necessary, then a two-week advance notice is required.
- Re-mobilization will be billed on a time-and-expenses basis.
- Service costing assumes use of 4-wheel drive vehicles for all project related vehicles. Additional requirements such as ATVs may require additional service costs.
- If the field crew(s) is required to work out of contiguous sequence due to conditions beyond the control of Aviat Networks, a charge equal to one day for each crew person will be assessed to EBRCS for each occurrence.

SITE ACCESS

Access to work sites will be made available by EBRCS for a minimum of 8 hours per day, 5 days per week or per the agreed schedule in the project plan. All roads leading to work sites shall not require more than a 4-wheel drive vehicle unless stated otherwise in this SOW and agreed to by both EBRCS and Aviat Networks. Any delays or additional costs caused by poor road conditions or site access issues not discussed prior to the start of the installation, integration or testing services will be billed to EBRCS as a billable change order and could have a negative impact on the project completion schedule.

All radios will be stored by Aviat in a secure location at the site or at Aviat controlled warehouse.

An inspection will be performed with EBRCS after completing the physical installation. Workmanship deficiencies will be noted on a punch list for immediate correction. This inspection is not intended to verify operation of the new system or suitability of components, but rather to inventory and document that all equipment and materials from the schedule of values are installed to acceptable workmanship quality standards. Site drawings will be reviewed and red-lined to reflect the installed condition.

TESTING

Test crews will begin work immediately after installation is complete. Testing, based on a standard set of Aviat Network test cases, will be performed on all provided equipment to confirm configuration, operation and manufacturer's specifications. Test data will be recorded on field test sheets, by technical field personnel who will also be responsible for documenting test results and any changes made to the design documentation.

The test crews will be trained on the equipment and utilize test equipment to perform all tests. Test equipment will have valid calibration certifications, which can be verified prior to commencing any tests. It is recommended that EBRCS take the opportunity to have their maintenance technicians witness or

participate in field commissioning testing to gain on-the-job training and experience on the new system components.

Commissioning tests will consist of a set of standard Aviat Networks test cases and include turn-up and performance verification tests and circuit tests to verify end-to-end continuity and equipment operation as well as any other tests documented in the field acceptance test plan. The field acceptance test plan shall be approved and agreed to by Aviat Networks and EBRCS prior to test execution. Test results will be recorded on field test data sheets and submitted to EBRCS. Refer to the field acceptance test document for details on the test to be performed.

System tests will be performed on a logical section/loop of the system. The system tests will be designed to demonstrate performance and functionality of system features as-well as end-to-end operation of individual circuits/services. System test results will establish benchmark system performance and operation prior to cut-over and acceptance. The test data sheets prepared during commissioning and system testing will become the base line document for maintenance and performance evaluation of the system over an extended period of time. EBRCS will be required to review the commissioning and acceptance testing and results and red-lined drawings and provide approval of the data and authorization to proceed with cut-over activities.

TRAFFIC CUT-OVER

Cut-over activities are anticipated to occur as radios are replaced. The Commissioning and system-level test activities verify that the new system is ready to accept traffic. Preparation, planning, logistics, and technical support are the critical elements in transferring existing services to new radios. EBRCS infrastructure is utilized for control of mission critical infrastructure; therefore, processes must also be put in place to minimize interruptions as well as to restore the original service in the event of unforeseen situations.

SAFETY

The health and safety of all individuals, whether in the field, plant or office, takes precedence over all other concerns. Management's goal is to prevent accidents and to reduce personal injury and occupational illness and comply with all safety and health standards. A code of safe conduct is important to the efficiency of operations. To the greatest degree possible, EBRCS will provide physical safeguards required for personal safety and health in keeping with the highest standards. Aviat Networks requires a written report from EBRCS for all accidents and incidents, no matter how small.

Safety and first aid material and supplies will be provided to all Aviat Network construction and installation personnel or made available at each site for the duration of this project. All safety and first aid material will be stocked at acceptable levels and will have not exceeded the expiration dates where applicable. EBRCS will be responsible for providing Aviat Networks with the location and phone numbers of all local emergency agencies.

9. LIFECYCLE SERVICES DETAIL

9.1 ONLINE TECHNICAL SUPPORT

The Customer will have access to the Aviat Networks Customer Online Technical Support website 24/7 for a variety of tools and support services. These tools/services include:

1. RMA Request & Status Updates.
2. RMA Reporting, such as repair turnaround time performance.
3. Technical Support, such as Service Request opening, reporting and status.
4. Information databases, such as technical notes, frequently asked questions, solutions for commonly asked technical or operational issues.
5. Software Downloads
6. Sales Order tracking and status (Eclipse Only)

   URL: http://www.aviatcloud.com/

9.2 REPAIR SERVICES

Repair services includes any repair or replacement of defective units during the stated warranty period. There may be additional charges during the warranty period for this service if customers are found to be returning a high level of NFF units, require advanced replacements, or send in a non-repairable unit. Prior to the warranty period expiring, customers may procure ongoing access to this support service through the purchase of an extended warranty program or through one of our AviatCare Maintenance support offerings. Otherwise, the Repair service is made available for out of warranty products through a Per Incident billing process that can be enabled through our regional RMA Desk. See further details on how repair services are provided below.

All equipment under this specific Maintenance Level Agreement will be covered with our standard Repair / Replace policy. There is no limit to the number of units returned for repair however customer is subject to the same limitations for No Fault Found (NFF), damaged beyond repair units, non-returned Advanced replacement units where additional charges may apply:

a) **Repair Center Support**: Customer shall place all RMA requests at the following link: https://aviatcloud.com/rma_tracking.asp . This link is available for use 24 hours a day, 7 days a week. Customers may also email or fax RMA requests to the appropriate Aviat Networks Repair Center. Aviat Networks will typically fax or email a confirmation with an RMA reference number within one (1) business day. Requests may also be made via telephone during such Aviat Networks Repair Center's Business Hours.

   In order for Aviat Networks to process an RMA request, the customer must provide the following information:

   - Company name
   - Shipping and billing address
   - Part Number
   - Serial Number of the defective unit(s)

- Unit software load
- Description of the suspected failure
- Whether any special requirements exist
- Maintenance Level Agreement contract number (if applicable), and
- Provide a purchase order at the applicable price for billable requests. Billable requests include any request for express service regardless of warranty status. Contact your local Aviat Networks Repair Center for price information.

b) **Turnaround Time**: Aviat Networks will provide a Turnaround time on repair as per the following:

- 20 Calendar Day turnaround time on Aviat Networks manufactured equipment
- 45 Calendar Day turnaround on Aviat Networks Manufactured Discontinued equipment

c) **Turnaround Time Calculation:** Turnaround time is measured from the time that a Returned Unit is received at the Aviat Networks Repair Center, which will be advised at time of issuing a RMA, until the time that it is shipped from the Aviat Networks Repair Center. Thus, the measurement of turnaround time does NOT begin when the Returned Unit is shipped from Customer's premises and does NOT include the shipping time accrued after the Returned Unit is shipped from the Aviat Networks Repair Center to Customer's premises. Additionally, Turnaround time will not be guaranteed in the following situations:

- If more than five (5) units of the same type or more than ten (10) units of any type are received at the same time.
- Missing information such as failure details, return shipping address, shipping instructions and/or any other information that may affect the start of the repair process of the shipment of the Returned Unit as the repair completed.
- Any Returned Unit is deemed No Fault Found.
- Any Returned Unit received due to any of the reasons listed in the Exclusions from Repair & Return Clause of this Section.
- Any Returned Unit received improperly packaged and therefore sustained physical or electrostatic damage in shipping.
- Returned Units placed in Isolation.
- Event of Excusable Delay as described under the Excusable Delay Clause of the Additional Terms & Conditions Section of this Agreement.

d) **OEM**: For OEM, repair turnaround times are set by the OEM supplier. Aviat Networks' close working relationship with OEM suppliers assures the best possible turnaround time. These times will be communicated to customer at time of RMA issuance. Excludes Tower repair.

e) **Packaging and Shipping Procedures:** Both Aviat Networks and the Customer are obligated to ensure that all deliveries are packaged in such manner as to achieve suitable mechanical and environmental protection during storage, handling and transport to the delivery address. Electrostatic Discharge (ESD) precautions should be followed during handling and packaging of all Units delivered. For each consignment of Units shipped to Aviat Networks, the Customer must provide a detailed Packing List and Commercial (Proforma) Invoice to support the delivery. Each Commercial Invoice must clearly state the full description, the value of each Unit and the RMA Number. Once a Unit has been repaired and shipped

to the Customer at the address provided by the Customer upon RMA request, Aviat Networks will send a pre-alert notification to the Customer comprising a faxed copy of the Commercial Invoice and Airway Bill Number pertaining to the shipment.

f) **Exclusions from Repair & Return**: The services to be rendered by Aviat Networks under this Agreement shall not comprise any damage, defects, malfunctions or failures caused by one or more of the following:

- Damage caused by mishandling, customer or third-party negligence, abuse or operation outside the Aviat Networks environment specifications, or due to a cause not solely attributed to Aviat Networks.
- Modifications, alterations, or repairs made other than by Aviat Networks.
- Damages by persons other than Aviat Networks or its authorized service providers.
- Any modification, removal or obliteration of a serial number or other identifying mark or any attempts thereof other than by Aviat Networks' authorized personnel.
- Damage that occurs during shipment from the Customer premises to Aviat Networks' premises outside the RLP (if applicable).
- Installed, stored, used, handled or maintained contrary to Aviat Networks' written instructions.
- Used in conjunction or combination with third-party material or equipment without the consent of Aviat Networks.
- Units returned for repair where there has been misuse, neglect, power failures, surges, accident or acts of nature such as fire, lightning strikes or flood.

Repairs necessitated during the Agreement period by any of the above causes may be made by Aviat Networks, and the Customer shall pay Aviat Networks' standard charges for time and materials, together with all shipping and handling charges arising from such repairs.

g) **Stockpiling of Failed Units**: The Customer agrees to obtain an RMA Number for all failed Units from an Aviat Networks Repair Center immediately following a failure and return the Units for repair immediately after receipt of the RMA Number from Aviat Networks. The customer agrees that this Agreement will not apply retrospectively to cover any Units failed and in the Customer's possession prior to the execution date of this Agreement and will not apply to any Units for which RMA Numbers had already been obtained from Aviat Networks prior to the date of execution of this Agreement. Following execution of this Agreement the Customer agrees not to stockpile failed Units and accepts that Aviat Networks will not be required to meet the Turnaround Times outlined in this Agreement if the Units are not returned to Aviat Networks on receipt of an RMA Number or if they are stockpiled.

h) **No Fault Found Fee**: If the number of Returned Units that the Customer reports are defective, but are thereafter tested by Aviat Networks and found to meet the applicable Aviat Networks Product specifications, exceeds ten percent (10%) of the total number of Returned Units received by Aviat Networks from the Customer during each year of the Support period, then Aviat Networks will charge the Customer the then-current No Fault Found inspection fee for each such non-defective Returned Units in excess of such ten percent (10%).

Damaged Beyond Repair: Returned Units that Aviat Networks (in its sole discretion) determined are damaged Beyond Repair or have been repaired (or otherwise modified) by a party other than Aviat Networks will be placed in Isolation. The Customer shall be advised by fax or e-mail, within ten (10) days working days, of the nature and extent of the damage. The Customer shall be responsible for informing Aviat Networks of the next course of action. If the Customer decides to replace the Unit(s), they must follow the usual

purchasing process. Note: If the Returned Unit is no longer in current manufacture and/or is OEM, Aviat Networks will not guarantee availability of a Unit for sale.

9.3 ADVANCE REPLACEMENT

Advance Replacement provides the Customer with shipments of a limited number of Units intended as an advanced replacement of Returned Units, upon the Customer's request. The service encompasses the following:

a) **Repair Center Support**: Customer shall place Advance Replacement requests at the following link: https://aviatcloud.com/rma_tracking.asp. This link is available for use 24 hours a day, 7 days a week. Customers MAY also email or fax the RMA request to the Aviat Networks Repair Center. Aviat Networks will typically fax or email a confirmation with an RMA Number within one (1) business day. Requests may also be made via telephone during such Aviat Networks Repair Center's Business Hours.

b) **Shipping Costs:** Aviat Networks will ship the Advance Replacement Unit(s) prepaid and shall be made pursuant to the delivery term DAP to named place of destination (Incoterms 2010). At its sole discretion, Aviat Networks will dispatch refurbished or new units(s) as Advance Replacement per turnaround time requested by the customer. This will occur within the commitment levels of Advance Replacement service requested after the completed request has been received at the Aviat Networks Customer Care Center. All units have the same warranty coverage as the original unit or the repair warranty, whichever is longer. Important Note: In the case of units damaged in shipping or if the package was not delivered, the customer has 20 days to report the problem to Aviat Networks for resolution. Any request received after 20 days will be resolved on a "best effort" basis but may result in additional costs to the customer.

c) **Packaging and Shipping Procedures:** Both Aviat Networks and the Customer are obligated to ensure that all deliveries are packaged in such manner as to achieve suitable mechanical and environmental protection during storage, handling and transport to the delivery address. Electrostatic Discharge (ESD) precautions should be followed during handling and packaging of all Units delivered. For each consignment of Units shipped to Aviat Networks, the Customer must provide a detailed Packing List and Commercial (Proforma) Invoice to support the delivery. Each Commercial Invoice must clearly state the full description, the value of each Unit and the RMA Number. Once a Unit has been repaired and shipped to the Customer at the address provided by the Customer upon RMA request, Aviat Networks will send a pre-alert notification to the Customer comprising a faxed copy of the Commercial Invoice and Airway Bill Number pertaining to the shipment.

d) **Returned Unit**: If this Agreement entitles the Customer to the RLP and the Customer elects to use it for the Returned Unit, the Customer will be invoiced for the List Price of the Advance Replacement Unit(s) if Aviat Networks does not receive notification to pick-up the pertinent Returned Unit, at most, ten (10) days after Customer's receipt of the Advance Replacement Unit. In the event that the Customer is not entitled to the RLP or the Customer elects to return the Returned Unit to Aviat Networks via a freight forwarder outside of the RLP, the Customer will be invoiced for the List Price of the Advance Replacement Unit if Aviat Networks does not receive the pertinent Returned Unit at the Aviat Networks Repair Center within, at most, thirty (30) days after receipt of the Advance Replacement Unit. The Returned Unit will become the property of Aviat Networks. The Customer agrees that the Returned Unit must be repairable and does not fall into any of the categories listed in the Exclusion from Advance Replacement clause.

e) **Exclusion from Advance Replacement**: The services to be rendered by Aviat Networks under this Agreement shall not comprise any damage, defects, malfunctions or failures caused by one or more of the following:

- Damage caused by mishandling, customer or third-party negligence, abuse or operation outside the Aviat Networks environment specifications, or due to a cause not solely attributed to Aviat Networks.
- Modifications, alterations, or repairs made other than by Aviat Networks.
- Damages by persons other than Aviat Networks, or its authorized service providers.
- Any modification, removal or obliteration of a serial number or other identifying mark or any attempts thereof other than by Aviat Networks' authorized personnel.
- Damage that occurs during shipment from the Customer premises to Aviat Networks' premises outside the RLP (if applicable).
- Installed, stored, used, handled or maintained contrary to Aviat Networks' written instructions.
- Used in conjunction or combination with third-party material or equipment without the consent of Aviat Networks.
- Units returned for repair where there has been misuse, neglect, power failures, surges, accident or acts of nature such as fire, lightning strikes or flood.

f) **No Fault Found Fee:** If the number of Returned Units that the Customer reports are defective, but are thereafter tested by Aviat Networks and found to meet the applicable Aviat Networks Product specifications, exceeds ten percent (10%) of the total number of Returned Units received by Aviat Networks from the Customer during each year of the Support period, then Aviat Networks will charge the Customer the then-current No Fault Found inspection fee for each such non-defective Returned Units in excess of such ten percent (10%).

g) **Limits:** Customer is entitled to receive a limited number of Advance Replacement Units per year. This number is not to exceed ten percent (10%) of the total Repair & Return requests during that year. Accrued Advance Replacement Units that have not been requested by the Customer may not be carried over to the next year. Additional Advance Replacement Units will be provided at Aviat Networks' then current prices, terms and conditions.

h) **Unavailability:** If an Advance Replacement Unit is not available, then Aviat Networks will repair the Returned Unit within a mutually agreed Turnaround time. Customer agrees that repair of the Returned Unit shall be Aviat Networks' sole obligation, and the Customer's sole remedy, if an Advance Replacement Unit requested by the Customer is not available.

i) **Turnaround Time Commitments**: Standard Advanced Replacement service ensures customer will receive a comparable unit to the one being returned within 3 to 5 business days from date of RMA. If customer requires a replacement unit in a shorter period of time there is an added charge for this and based on replacement unit availability will be delivered on a next business day basis. Customer will be informed at time of RMA request whether this service can be provided or not depending on component availability.

9.4 REPAIR LOGISTICS PROGRAM (RLP)

Aviat Networks shall provide free freight to the Customer for all Units returned via the Aviat Networks Repair Logistics Program (RLP). In the event that the Customer returns Units to Aviat Networks via a freight forwarder outside of this Program, all freight expenses and damage liability will be the responsibility of the Customer. Aviat Networks is responsible for all tariffs, duties, or taxes associated with importing Units for repair. After the repair, the Units shall be returned to the Customer DDU (Delivered Duty Unpaid) Customer's premises (Incoterms 2000). To implement the return of a Unit via this Program the Customer shall request an RMA for the Unit using the link in the Repair Services or Advance Replacement Sections or the contact information as listed in the Aviat Networks Contacts Section.

Liability of Units Damaged During Shipping: Aviat Networks will assume responsibility for insuring the Units against loss or damage that is moving via the RLP. The Customer shall examine the condition of all shipments returned from Aviat Networks via the RLP at the time of delivery. Visible signs of damage shall be brought to the attention of the carrier and the contents shall be examined for damage immediately. Aviat Networks will not be liable for any direct reports by the Customer for Units that are found to be damaged upon receipt by the Customer that are made over seven (7) days after the Units have been delivered. Units damaged through transit shall be returned for repair at Aviat Networks through the normal return process. Damage or loss incurred to Units shipped to Aviat Networks by the Customer outside the RLP shall be the responsibility of the Customer.

9.5 REMOTE TECHNICAL SUPPORT 24 X 7

Customer 24 X 7 Remote Support provides around-the-clock (24 X7) telephone access to Aviat Networks' Technical Assurance Center in order to resolve Critical Service Requests, Major Service Requests, Minor Service Requests and Inquiry Service Requests.

a) **Telephone Number:** Customer may contact Aviat Networks' Technical Assistance Center (TAC) regarding such Service Requests via telephone at any time during normal business hours. **OR** Customer may contact Aviat Networks' Technical Assistance Center (TAC) regarding such Service Requests via telephone at any time during the day or night. For night support services (after business hours in the local time zone), Aviat Networks will handle all such requests that are Critical or Major that the Customer reasonably categorizes as being High Priority. In addition, with this service customer can pre-schedule after hours support when doing a new software installation or a network upgrade related to covered equipment.

b) **Rapid Response Time**: Aviat Networks will route Critical Service Requests to the appropriate TAC subject matter expert within fifteen (15) minutes of call receipt.

c) **Service Request Number:** Aviat Networks will assign, to each Service Request, a number that will be logged, tracked and stored in our Case Management database.

d) **Service Request Management**: Aviat Networks will dedicate continuous attention to Critical and Major Service Requests until service is restored or request is closed. Aviat Networks will work to resolve the Service Request until Customer accepts the proposed solution, at which point the TAC will close the Service Request.

e) **Documented Escalation Procedures**: Aviat Networks will implement internal escalation and notification procedures in order to facilitate the timely resolution of Service requests by a TAC Engineer with an adequate level of expertise. The technical support process includes rigid managerial escalations that are intended to facilitate the appropriate handling of recovery efforts and Customers being regularly

updated on the status of the Service Request. Additional information on this escalation process is available in our Global Network Service Customer Support guidelines document available on our website at www.aviatnetworks.com.

f) **Service Request Submission**: Under this Statement of Work, there is no limit to the number of Service Requests that Customer may submit for resolution. Customer may also define and authorize specific users within its organization to have access to this Service Request Submission Service. To ensure appropriate management of this support Aviat Networks has implemented a Support Assurance Program where an Express PIN will be assigned to each customer which clearly identifies the level of service a customer is entitled to receive. All Service Request Submissions will require Express PIN information prior to being submitted.

Service Request Severity Classifications:

There are four (4) Service Request severity classifications: (a) Critical; (b) Major; (c) Minor; and (d) Inquiry. Critical, Major and Minor Service Requests pertain to problems in the Product. Inquiry Service Requests pertain to questions about the Product or Services. The four (4) Service Request severity classifications are defined as follows:

a) **Critical Service Requests** are those that severely affect service, traffic, billing and/or maintenance capabilities, and require immediate corrective action (regardless of the time of day or day of the week).

b) **Major Service Requests** are those that cause conditions that seriously affect Product operation, maintenance and/or administration, and require immediate attention. The urgency is less than in Critical Service Requests because of a lesser immediate or impending effect on Product performance, customer and/or network operation and revenue.

c) **Minor Service Requests** are problems that are tolerable during Product use, do not significantly impair the functioning of the Product and do not significantly affect service to customers.

d) **Inquiry Service Requests** are questions about technical details concerning the usage or behavior of the Product.

9.6 PROVISION SUPPORT 24 X 7

Aviat Networks shall provide remote technical support to the Customer on ProVision. The remote technical support 24 X 7 shall be provided as per the terms outlined in the Remote Technical Support 24 X 7 section of this Agreement.

Aviat Networks shall provide support on the current and previous ProVision production release and will investigate all reproducible product anomalies for the supported version. Aviat Networks shall also provide general availability releases and product updates to the Customer free of charge during the coverage period.

Customer Responsibility:

To enable the Aviat Networks TAC to fully investigate ProVision issues, the Customer shall provide the TAC the appropriated logs and remote access where possible. The Customer will provide the capability to allow Aviat Networks to remotely access the Customer's network by means of a secure internet connection to the Customer's site. This connection process will need to be defined at time of agreement such that any issues arising after Agreement closure can be addressed expeditiously.

Exclusion from Provision Support 24 X 7

The services to be rendered on ProVision by Aviat Networks under this Agreement shall not comprise any services which are required as a result of one or the more of the following:

- Customers using old versions of ProVision: The ProVision Agreement provides regular updates; customers are required to have the current GA release or the previous GA release installed and commissioned before they can obtain Aviat Networks technical support.
- Customer's lack of basic user training: It is expected that all users will have received basic user training when the ProVision system was installed.
- Network Planning; NMS Integration: Training courses; Installation and Commissioning; On Site Support. These are separate Aviat Networks service offerings, which are not delivered under this Agreement.
- Due to the complex nature of ProVision issues, which may be network related rather than ProVision related, not all Customer-defined level three product anomalies can be rectified within the commercial bounds in which Aviat Networks operates. Aviat Networks will require that all product anomalies are reproducible, prior to the commencement of any detailed fault analysis or potential product re-engineering. Aviat Networks undertakes to provide a response on all logged product issues and will provide workarounds where possible.

9.7 REMOTE NETWORK MONITORING

Aviat Networks remote monitoring solution provides customers with a bundled offering that combines traditional network monitoring and event management services with fault resolution to offer an end-to-end operations management solution. Services in this portfolio offer a broad, all-in-one solution managed through a single, FIPS 140-2 compliant secure Virtual Private Network (VPN) connection to Aviat's ISO27001 certified Network Operations Center (NOC).

Aviat Networks remote monitoring provides:

- Surveillance and Network Monitoring
  - 24x7 monitoring of network elements (Refer to Table 1 for NOC response times)
  - Detect / identify faults and alarms

- Event Management
  - Triage
    - Correlate alarms where appropriate
    - Review maintenance schedules / weather patterns / known issues
    - Assess severity and service impact

  - Troubleshooting
    - Diagnose and isolate the fault / alarm
    - Coordinate restoration and repair – remotely or onsite
    - Actively manage the event from cradle to grave

- Notification

- Report events to customer in real-time via Phone / Email / Portal

- Trouble Ticketing
  - Document the fault
  - Manage ticket until fault is resolved
  - Generate trouble ticket reports
  - Capture lessons learned from each incident into our Knowledgebase for future reference

- Call out and Dispatch
  - Dispatch field operations and vendors for physical analysis and repair
  - Coordinate all aspects of the dispatch to ensure the right resource is at the right
  - location with the right tools to resolve the problem within the SLA commitment.

- Failure Analysis
  - Generate post-mortem reports documenting issues and lessons learned as appropriate
  - Drive continuous improvement of process and tools

- Reporting
  - Provide monthly reports: Performance to SLA / Network Performance

Aviat Networks strives to troubleshoot and resolve issues remotely prior to or, in place of, dispatching field resources to site. When an alarm is received, Aviat Networks shall perform a root cause analysis. The NOC will first attempt to perform remote diagnostics by reviewing and correlating all alarms, looking at the current weather conditions, receive signal levels, signal to noise ratio, etc. After troubleshooting the issue, if it is determined an emergency onsite dispatch is required, the following process will be followed.

- A support case is generated to track all aspects of the identified issue
- NOC reviews site requirements and verifies pre-access approvals
- NOC initiates a dispatch request and identifies all pre-requisites, including hardware, identified during remote troubleshooting
- NOC relays dispatch status to all authorized parties with an estimated ETA
- Onsite arrival SLA is logged into the case and a conference bridge is initiated
- Ticket is closed once the issue is resolved or workaround is completed
- Email notification is sent to all identified parties
- Technician processes any failed hardware through the Aviat RMA process
- Technician updates spares inventory as required for hardware failures

TIERED SUPPORT FUNCTIONS: NOC & TAC

Tier 1: NOC Personnel

NOC engineers receive alarm notifications from Aviat's monitoring tools, open support cases and, based on customer/product data, look at all aspects of a site to determine the potential impact. If, after the initial review, an issue cannot be resolved remotely, the NOC will initiate a field dispatch and escalate the issue to the tier 2 TAC support engineer. The NOC engineer identifies issue severity (Critical, Major, Minor) based on the customer SLA at the time of escalation. Within the TAC team, NOC escalations take priority over existing customer issues with the exception of a customer network outage.

Tier 2: TAC

If a problem is not resolved within the target SLA resolution time for Tier 1, an automatic escalation process is initiated, and the issue is forwarded to the Tier 2 TAC engineering team. Tier 2 generally engages when issues are beyond simple hardware failures. At this level, an issue generally involves some level of configuration, or the problem is intermittent in nature.

Tier 3: TAC

Tier 3 engineering typically gets involved when; there are complex interoperability issues identified between the microwave and other components in the network, a problem appears to be software related, or when new products or software have been introduced into the network and present issues not previously seen before.

NETWORK OPERATIONS CENTER SLA RESPONSE TIMES

Table 15.1

SR Priority Level	Alarm Severity	Event / Alarm Ack	Customer Event Alarm Notification	Aviat Reaction Time	Usage	Response
1	CRITICAL (Service Affecting)	< 5 min	< 10 min	< 15 min	Used for events that is currently impacting service or ability to view network elements (LOV).	Outages are referred to Emergency Recovery immediately. Immediate and continuous effort and escalation until resolved or restored to pre-incident condition or work around is implemented. Resolved or referred to Tier II/III support group.
2	MAJOR (Non-Service Affecting)	< 30 min	< 60 min	< 75 min	Used for in-service trouble conditions that does not affect service nor qualify as a loss of redundancy. Typically, these conditions if unresolved will not result in a Priority 1 event.	Resolved or referred to Tier II/III support group. Continuous effort until either a) service level is restored to pre-incident, b) acceptable workaround is implemented, or c) an action plan is instated that will meet MTTR requirements.
3	MINOR	< 30 min	Monthly Summary	< 12 hrs	Used for non-service affecting conditions that if not resolved will not result in a Priority 1 or 2 events or issue.	Resolved or referred to Tier II/III support group

PLEASE NOTE:

Phone call wait time: Aviat strives to minimize customer hold time with an average wait time of 30 seconds and maximum wait time of 5 minutes. A direct line will be provided.

Email response time: Acknowledge email requests by a live person within 15 minutes

The maximum amount of time between the occurrence of a condition that requires dispatch and the crew dispatch phone call is < 60 minutes

10. SUPPLEMENTAL TERMS AND CONDITIONS

The terms and conditions governing this Agreement shall be the following then-current standard Aviat Networks terms and conditions documents as periodically updated:

- Aviat Networks Standard Terms and Conditions of Sale is attached here: [http://www.aviatnetworks.com/media/files/AVWN_STCS.pdf]
- Aviat Networks Global Support (GSS) Guidelines 4.0 is attached here (The GSS Guidelines is on this page, second document from the bottom): [http://aviatnetworks.com/services/aviatcare/support-services/]

However, these listed documents are superseded by the following supplemental terms and conditions applicable to this Agreement. In the event of a conflict between the documents listed above and these supplemental terms and conditions, these supplemental terms and conditions shall take precedence.

If the Customer issues a purchase order or other transaction document related to this Agreement, any additional or conflicting terms and conditions in the purchase order or other transaction document will have no effect. This statement does not apply to any Change Order executed by the parties per the terms of this Agreement including mutually agreed terms specific to the applicable Change Order.

SCOPE OF SERVICES

Aviat Networks will furnish the equipment, materials and services ("Services") designated in this Agreement as may be required from time to time for the period specified in the Agreement. The Services will be provided in conformity with the terms, conditions, specifications and other requirements of this Agreement, and each request for Services will be governed by the terms and conditions stated herein.

This Agreement covers only the Aviat Products and any Third-Party Products which are enrolled at the start of the Agreement or added periodically as part of the equipment upgrades covered by this Microwave Upgrade Agreement. This Agreement does not apply to any Products not designated in this Agreement. If any additional products are necessary to implementation under this Agreement, they may be purchased under a mutually agreed Change Order to this Agreement, subject to terms and conditions in the applicable Change Order.

The Customer must ensure that the Aviat Products and any Third-Party Products to be included in this Agreement are in good operating condition prior to the commencement of this Agreement. Aviat Networks reserves the right to inspect any and all of the Aviat Products and Third-Party Products to be included in the Agreement prior to the commencement of the Agreement, and if the Aviat Product or any Third-Party Product is found to be defective, the Customer shall be responsible for the cost of repair of the defective units.

An authorization to return Units to Aviat Networks under this Agreement must be obtained from an Aviat Networks representative prior to making shipment to the Aviat Networks' Repair Center. Aviat Products repaired and returned under the maintenance aspect of the Services, or Aviat Products supplied under the equipment upgrade part of the Services, will be subject to the

Services of this Agreement upon their receipt by Customer through the termination or expiration of this Agreement.

TERM

The term of this Agreement is for a ____ (_) year period from the Effective Date through _____, _____.

PRICES/PAYMENT/TAXES/SHIPPING

Payment is due annually in advance starting from the Effective Date of this Agreement. All payments shall be made via bank transfer to the accounts specified on the invoice, in full in advance of the commencement of each year of service/coverage. The total amount is due and payable to Aviat Networks within sixty (60) days of the invoice date.

All prices are exclusive of all sales, use, excise, and other taxes, duties or charges. Unless evidence of tax-exempt status is provided by Customer. Customer shall pay, or upon receipt of invoice from Aviat Networks, shall reimburse Aviat Networks for all such taxes or charges levied or imposed on Customer, or required to be collected by Aviat Networks, resulting from this transaction or any part thereof.

POTENTIAL SUBSTITUTION

Because of the possibility that there might be a significant time frame between when this Agreement is executed and when the Services are performed, Aviat Networks may substitute any of the promised equipment or software so long as the substitute is equivalent or superior to the initially promised equipment or software.

ACCEPTANCE

Acceptance of the equipment upgrade part of the Services will occur as each element of the upgrade equipment, software and services under the Statement of Work herein are delivered or performed. Services indicated as annual in nature will be considered as completed at the end of the annual period inherent to such Services.

SERVICES WARRANTY

Notwithstanding any other warranty provisions in this Agreement's governing documents, the Services performed under this Agreement (including installation services) are warranted to have been performed in a good and workmanlike manner for one (1) year from performance. Any Aviat US Product equipment and software warranties commence upon shipment.

DESIGNATED PROJECT MANAGER

The Customer will provide a designated project manager for the major system equipment upgrades under this Agreement, all approvals that are necessary for Aviat Networks to perform its work at the work sites; and access to the work sites as reasonably requested by Aviat Networks so that it may perform its duties in accordance with this Agreement. Customer will ensure that all work sites it provides will be safe, secure, and in compliance with all applicable industry standards. To the extent applicable, the Customer will ensure that these work sites have adequate physical space; air conditioning and other environmental conditions; electrical

power outlets, distribution, equipment and connections; and adequate telephone or other communication lines.

CANCELLATION

Customer cancellation capability is limited as follows, due to the impracticality of cancellation of all or part of the project during key periods under this Agreement when implementation of major equipment upgrades, replacements and installations is under way. During these periods, it is impractical in maintaining the operational integrity of Customer's system to discontinue work, which would leave a "mixed" system of old and upgraded equipment in the Customer system: These periods of equipment upgrade work, as indicated in table 4.1 may not be canceled by the customer. Therefore, no cancellation is allowed during the first 3 years of this agreement.

Additionally,

(1) If Customer cancels the services and contractual commitment at any time before the end of the term of this Agreement, for any reason other than Aviat's default, then Customer will pay to Aviat an additional cancellation fee equal to any management discount indicated as having been applied to pricing under this Agreement; and
(2) If Customer terminates this service and contractual commitment before the end of the term, for any reason other than Aviat's default, then Aviat will retain all Customer payments through the effective date of a notice of cancellation.

CHANGES

Any changes to this Agreement will be effective only if made in writing and signed by a duly authorized representative of both parties.

EXCUSABLE DELAY

Aviat Networks shall be excused from performance under this Agreement and not be liable to Customer for delay in performance attributable in whole or in part to any cause beyond its reasonable control, including but not limited to, actions or inactions of government whether in its sovereign or contractual capacity, judicial action, war, civil disturbance, insurrection, sabotage, act of a public enemy, labor difficulties or disputes, failure or delay in delivery by Aviat Networks' suppliers or subcontractors, transportation difficulties, shortage of energy, materials, labor or equipment, accident, fire, flood, storm or other act of God, or Customer's fault or negligence.

In the event of an excusable delay, Aviat Networks shall make reasonable efforts to notify Customer of the nature and extent of such a delay and Aviat Networks (i) will be entitled to a schedule extension on at least a day-for-day basis, (ii) in the event of Customer's fault or negligence, will be also entitled to an equitable adjustment in the price of this contract.

ASSIGNMENT

Customer may not assign this Agreement in whole or in part without the prior written consent signed by an officer of Aviat Networks. Such consent shall not be unreasonably withheld.

GOVERNING LAW, VENUE AND JURISDICTION

This Agreement will be governed by and construed in accordance with the laws of the **State of California**. The parties agree that any action to enforce any provision of this Agreement or arising

out of or based upon this Agreement or the business relationship between Aviat Networks and Customer will be brought in a **local or Federal court** of competent jurisdiction in **Milpitas, CA.**

ENFORCEABILITY

If any provision of this Agreement shall be held to be invalid, illegal or unenforceable, the validity, legality or enforceability of the remaining provisions shall in no way be affected or impaired.

COMPLIANCE WITH LAW

Customer agrees to assist Aviat Networks to comply with any applicable conventions, laws, rules, regulations, and bylaws incident to its activities under this Agreement, including, without limitation, United States export control regulations, the United States Foreign Corrupt Practices Act, and the United States anti-boycott regulations. Customer will promptly deliver to Aviat Networks a copy of any notice or instrument alleging a violation of any of these laws.

ENTIRE AGREEMENT

This Agreement supersedes all previous communications, transactions, and understandings, whether oral, or written, and constitutes the sole and entire Agreement between the parties pertaining to the subject matter hereof. No modification or deletion of, or addition to these terms shall be binding on either party unless made in writing and signed by a duly authorized representative of both parties.

The Effective Date of this Agreement will be the date of last signature below.

SIGNATURES

Customer	**Aviat U.S., Inc.**
Print Name: _____	**Print Name:** _____
Title: _____	**Title:** _____
Date: _____	**Date:** _____
Signature: _____	**Signature:** _____

EBRCSA 10 Year Cash Flow Projection											
	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24	FY2024-25	FY 2-25-26	FY 2026-27	FY 2027-28	FY 2028-29	FY 2029-30
	Projected	Budget	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast	Forecast
Operating Reserve											
Balance - beginning	1,733,162	1,994,000	2,215,500	2,186,215	2,238,522	2,305,678	2,374,848	2,446,094	2,519,477	2,595,061	2,672,913
Receipts from members	7,844,000	6,638,000	6,655,400	6,655,400	6,655,400	6,655,400	6,655,400	6,655,400	6,655,400	6,655,400	6,655,400
Payments to suppliers	-3,988,000	-4,431,000	-4,372,430	-4,477,044	-4,611,356	-4,749,696	-4,892,187	-5,038,954	-5,190,122	-5,345,826	-5,506,201
Transfer to Capital Reserve	-3,595,162	-1,985,500	-2,312,255	-2,126,049	-1,976,888	-1,836,534	-1,691,968	-1,543,063	-1,389,694	-1,231,722	-1,069,012
Balance - ending	1,994,000	2,215,500	2,186,215	2,238,522	2,305,678	2,374,848	2,446,093	2,519,477	2,595,061	2,672,913	2,753,100
Debt Service Reserve											
Balance - beginning	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000			
Service payment	1,124,000	1,232,000	1,222,248	1,222,248	1,222,248	1,222,248	1,222,248	1,222,248			
Prinicipal	-473,000	-492,000	-512,000	-532,000	-553,000	-576,000	-600,000	-623,000			
Bond Interest	-177,000	-158,000	-138,000	-118,000	-97,000	-74,000	-50,000	-27,000			
Transfer to Capital Reserve	-474,000	-582,000	-572,248	-572,248	-572,248	-572,248	-572,248	-1,572,248			
Capital Reserve Balance - ending	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	0			
Capital Reserve - CURRENT											
Balance - beginning	7,943,576	10,264,738	10,765,238	11,734,741	12,518,038	13,152,174	15,310,956	17,325,172	20,190,482	21,330,176	22,311,898
Grants	167,000										
Transfers In	4,069,162	2,567,500	2,884,503	2,698,297	2,549,136	2,408,782	2,264,216	3,115,311	1,389,694	1,231,722	1,069,012
Capital Outlay - TDMA Upgrade	-1,915,000	-2,067,000	-1,915,000	-1,915,000	-1,915,000						
Capital Outlay - Other	0	0	0	0	0	-250,000	-250,000	-250,000	-250,000	-250,000	-250,000
Capital Reserve Balance - ending	*10,264,738*	*10,765,238*	*11,734,741*	*12,518,038*	*13,152,174*	*15,310,956*	*17,325,172*	*20,190,483*	*21,330,176*	*22,311,898*	*23,130,910*
TOTAL RESERVE BALANCE	*13,258,738*	*13,980,738*	*14,920,956*	*15,756,560*	*16,457,852*	*18,685,804*	*20,771,265*	*22,709,960*	*23,925,237*	*24,984,811*	*25,884,010*
Capital Reserve - Add MW & MPLS											
Balance - beginning	7,943,576	10,264,738	10,765,238	11,734,741	10,972,017	10,060,132	10,672,893	11,141,088	12,460,378	12,054,051	13,035,773
Grants	167,000										
Transfers In	4,069,162	2,567,500	2,884,503	2,698,297	2,549,136	2,408,782	2,264,216	3,115,311	1,389,694	1,231,722	1,069,012
Capital Outlay - TDMA Upgrade	-1,915,000	-2,067,000	-1,915,000	-1,915,000	-1,915,000						
Capital Outlay - MW & MPLS	*0*	*0*	*0*	*-1,546,021*	*-1,546,021*	*-1,546,021*	*-1,546,021*	*-1,546,021*	*-1,546,021*	0	0
Capital Outlay - Other	0	0	0	0	0	-250,000	-250,000	-250,000	-250,000	-250,000	-250,000
Capital Reserve Balance - ending	*10,264,738*	*10,765,238*	*11,734,741*	*10,972,017*	*10,060,132*	*10,672,893*	*11,141,088*	*12,460,378*	*12,054,051*	*13,035,773*	*13,854,785*
TOTAL RESERVE BALANCE	*13,258,738*	*13,980,738*	*14,920,956*	*14,210,539*	*13,365,810*	*14,047,741*	*14,587,181*	*14,979,855*	*14,649,112*	*15,708,686*	*16,607,885*
Capital Reserve - Add MW & MPLS + Refinance											
Balance - beginning	7,943,576	10,264,738	11,169,208	12,390,681	13,425,948	14,312,054	14,807,806	15,158,992	16,361,273	15,837,937	16,819,659
Grants	167,000										
Transfers In	4,069,162	2,567,500	2,884,503	2,698,297	2,549,136	2,408,782	2,264,216	3,115,311	1,389,694	1,231,722	1,069,012
Capital Outlay - TDMA/MW & MPLS	-1,915,000	-1,663,030	-1,663,030	-1,663,030	-1,663,030	-1,663,030	-1,663,030	-1,663,030	-1,663,030	0	0
Capital Outlay - Other	0	0	0	0	0	-250,000	-250,000	-250,000	-250,000	-250,000	-250,000
Capital Reserve Balance - ending	*10,264,738*	*11,169,208*	*12,390,681*	*13,425,948*	*14,312,054*	*14,807,806*	*15,158,992*	*16,361,273*	*15,837,937*	*16,819,659*	*17,638,671*

TOTAL RESERVE BALANCE	*13,258,738*	*14,384,708*	*15,576,896*	*16,664,470*	*17,617,732*	*18,182,654*	*18,605,085*	*18,880,750*	*18,432,998*	*19,492,572*	*20,391,771*

	0

East Bay Regional Communications System Authority

Participating agencies include Alameda and Contra Costa Counties and the following cities and special districts: Alameda, Albany, Antioch, Berkeley, Brentwood, Clayton, Concord, Danville, Dublin, El Cerrito, Emeryville, Fremont, Hayward, Hercules, Lafayette, Livermore, Martinez, Moraga, Newark, Oakley, Pinole, Pittsburg, Pleasant Hill, Pleasanton, Richmond, San Leandro, San Pablo, San Ramon, Union City, Walnut Creek, East Bay Regional Park District, Kensington Police Community Services District, Livermore Amador Valley Transit Authority, Moraga-Orinda Fire District, Rodeo-Hercules Fire District, San Ramon Valley Fire District, California Department of Transportation, Ohlone Community College District, Contra Costa Community College District, Dublin-San Ramon Services District and University of California, Berkeley

AGENDA ITEM NO. 6.

AGENDA STATEMENT
OPERATIONS COMMITTEE
MEETING DATE: November 6, 2020

TO: Operations Committee
East Bay Regional Communications System Authority (EBRCSA)

FROM: Thomas G. McCarthy, Executive Director
East Bay Regional Communications System Authority

SUBJECT: Subcommittee to Recommend Change in Compensation for Executive Director

RECOMMENDATIONS:

Request two members of the Operations Committee work with two members of the Finance Committee and Board Chair to make a recommendation to the Board of Directors concerning current compensation for the Executive Director's salary and possible elevator for the next three years.

SUMMARY/DISCUSSION:

The Executive Director entered a contract with East Bay Regional Communications System Authority in 2015 and the contract has not been reviewed nor the compensation adjusted since 2015. The Board Chair is asking for two volunteers from the Operations Committee to work with him and two members of the Finance Committee to review the compensation and contract. The Board Chair desires the subcommittee to make a recommendation concerning the current compensation and possible escalator for the Executive Directors Compensation for an additional three years.

RECOMMENDED ACTION:

It is recommended that the Committee discuss and appoint two members to assist the Board Chair and subcommittee in preparing a possible change in compensation for the Executive Director to the Board of Directors.

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AGENDA ITEM NO. 7.

AGENDA STATEMENT
OPERATIONS COMMITTEE MEETING
MEETING DATE: November 6, 2020

TO: Operations Committee
East Bay Regional Communications System Authority (EBRCSA)

FROM: Tom McCarthy, Executive Director
East Bay Regional Communications System Authority

SUBJECT: Approval of Draft 2021 EBRCSA Meeting Schedule

RECOMMENDATIONS:

Approve the Draft 2021 EBRCSA Meeting Schedule.

SUMMARY/DISCUSSION:

The Operations Committee will review the Draft 2021 meeting schedule for the Board of Directors, Finance Committee, Operations Committee, and Technical Advisory Committee meetings.

RECOMMENDED ACTION:

Recommend that the Board of Directors approve the Draft 2021 EBRCSA Meeting Schedule.

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2021 EBRCSA Board and Committee Meeting Schedule

Board of Directors

March 5	10:00-12:00	Assembly Room, Alameda County OES
May 7	10:00-12:00	Assembly Room, Alameda County OES
September 24	10:00-12:00	Assembly Room, Alameda County OES
December 3	10:00-12:00	Assembly Room, Alameda County OES

Committees:

February 19	
Operations Committee	10:00-11:00 Room 1013
Finance Committee	11:00-12:00 Room 1013
April 2	
Operations Committee	10:00-11:00 Room 1013
Finance Committee	11:00-12:00 Room 1013
September 3	
Operations Committee	10:00-11:00 Room 1013
Finance Committee	11:00-12:00 Room 1013
November 5	
Operations Committee	10:00-11:00 Room 1013
Finance Committee	11:00-12:00 Room 1013

TAC Meetings: First Thursday of the Month 09:30-11:00 in Room 1013 (if available) or 40% side

January 7
February 4
March 4
April 1
May 6
June 3
July 1
August 5
September 2
October 7
November 4
December 2

Revised: 10/30/2020

East Bay Regional Communications System Authority

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AGENDA ITEM NO. 8.

AGENDA STATEMENT
OPERATIONS COMMITTEE MEETING
MEETING DATE: November 6, 2020

TO: Operations Committee
East Bay Regional Communications System Authority (EBRCSA)

FROM: Tom McCarthy, Executive Director
East Bay Regional Communications System Authority

SUBJECT: Annual Election of a Board Chair and Vice Chair as Required by the JPA Agreement and Bylaws

RECOMMENDATIONS:

Recommend to the Board of Directors the Annual Election of a Board Chair and Vice Chair, as required by the JPA Agreement and Bylaws, be held at the December 4, 2020, Board of Directors meeting.

SUMMARY/DISCUSSION:

The JPA Agreement and Bylaws for the Authority state that the Board Presiding officers shall be a Chair and Vice-Chair, elected annually from among its membership, to preside at meetings. In the absence of the Chair, the Board shall be presided over by the Vice-Chair. The positions of Chair and Vice-Chair will be filled by a representative from each County. If the Chair is from Alameda County, the Vice-Chair will be from Contra Costa County. If the Chair is from Contra Costa County, the Vice-Chair will be from Alameda County.

The Board of Directors will receive nominations from sitting members of the Board to fill the positions of Chair and Vice-Chair. The Board will vote on the nominations for Chair and Vice-

Chair following Roberts's Rules of Order. The newly elected Chair and Vice Chair will assume their positions at the conclusion of the meeting and will continue in the positions for one year.

RECOMMENDED ACTION:

It is recommended that the Committee recommend to the Board of Directors to hold the election of Board Chair and Vice Chair as required by the JPA Agreement and Bylaws, at the December 4, 2020 Board of Directors meeting.