

MARIN EMERGENCY RADIO AUTHORITY

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DATE: March 19, 2018
TO: MERA Next Generation Project Oversight Committee
FROM: Dave Jeffries, Deputy Executive Officer for the Next Gen Project
SUBJECT: AGENDA ITEM C: Mobile and Portable Radio Transition Proposals, Technology Upgrades and Related Discounts

Recommended Action: Review, discuss and provide direction to staff.

Introduction:

MERA staff has been in regular discussion with Motorola on several related issues:

1. Dual Band Radio Order
2. Transition from Gen I to Next Gen System
3. Radio Programming
4. Vehicle Installation Schedule
5. Overall Project Schedule
6. Project Discount for early order of subscriber equipment
7. Extended warranties for equipment ordered early

As a result of these discussions, three options have emerged with regard to the timing of radio orders.

Recommendation:

Staff recommends that the Committee consider adoption of option # 3 described below. If option #3 is selected, time becomes an issue as the discount described below has been offered if MERA takes delivery of radios in June 2018 and would require that all member agency radio orders be confirmed by 04/30/18 so that an order can be placed with Motorola in time for that June delivery. Staff has requested Motorola extend the offer for an additional 30 days.

At this point, technical issues are still being addressed that need be resolved prior to bringing this proposal to the Governing Board for action.

Options:

Option #1: Take no action – Agencies could still acquire dual band radios this year with the free dual band upgrade, but this may lose the \$500,000 discount for early ordering of radios that is currently being offered by Motorola. All radios not ordered during the two early-order windows would be delivered to agencies just prior to cutover. Installations in vehicles would take place during the system cutover and

completed by Final System Acceptance currently scheduled to be approx. April 2021. Advantages – No deviation from current plan.

Option #2: Order all mobile radios early, but closer to cutover – Agencies could still order dual band radios this year with the free dual band upgrade. If mobile radios are ordered early, they can be installed prior to system cutover and placed into operation, potentially saving 8 months of project time. However, by delaying the order until closer to cutover, MERA agencies may lose the \$500,000 discount for early ordering. Also, dual band radios will be required if installed before system cutover. Purchasing the second band will cost approx. \$500,000 for a total cost increase of \$1,000,000 over Option #3. Programming of radios can be accelerated through the programming recommendation below but would require additional upfront cost in order to provide faster transition at system cutover and faster updates in the future. Advantages – Purchases are delayed until closer to cutover to Next Gen, eight months of radio installation and reprogramming can potentially be shortened.

Option #3: Order all mobile radios this year – This allows agencies to order dual band portable radios, this year, if they wish. All mobile radios would be ordered as dual band radios. Vehicle installations would begin this year and put in use into operation on the current system. At system cutover, the reprogramming recommendations described below, would allow for a rapid transition from Gen I to Next Gen. This preserves the \$500,000 radio discount and provides the needed second band as a free upgrade (approx. \$500,000) from Motorola for an approx. \$1,000,000 in savings from Motorola. This could potentially save MERA 8 months of project time after system cutover which we have estimated at approx. \$100,000 per month or \$800,000 reduced costs for the eight months. This option includes additional costs for Radio Management and a combination of Over The Air Programming (OTAP) and Wi-Fi programming at an approx. cost of \$523,556.43 to facilitate rapid cutover and saving \$75,000 to \$130,000 in technician programming costs. Advantages – discounts for purchases, eight months of radio installation time can potentially be shortened, and programming time can be reduced.

Discussion:

1. Effects of the Options - Mobile Radios –

- a. Option #1 – Agencies can acquire dual band radios early, otherwise MERA will obtain single band radios that will be installed after system cutover to the Next Gen system begins.
- b. Option #2 – MERA would acquire dual band radios with Gen I and Next Gen capabilities. Agencies can obtain these radios this year with Motorola's upgrade offer. Agencies can upgrade to tri-band (for those agencies that require VHF-High band) with a local agency upgrade cost. Installation would need to be scheduled to be completed prior to cutover. These radios would be programmed as Gen I radios, and installation would begin this year. At cutover to the Next Gen system, these radios would be remotely reprogrammed and then be setup to operate as Next Gen radios.
- c. Option #3 - Motorola previously the single band radios. In option #3, Motorola will upgrade those radios dual band radios with the Gen I and Next Gen capabilities. Agencies that require it can upgrade to tri-band (adding VHF-High band) with a local agency

upgrade cost. Mobile radios would be programmed as Gen I radios, and installation would begin this year. At cutover to the Next Gen system, these radios would be remotely reprogrammed to operate as Next Gen radios. Currently, to receive the discount offered by Motorola, these radios require delivery to MERA in June 2018.

2. Effects of the Options - Mobile Radio Installations –

- a. Motorola's subcontractor, Red Cloud, will be installing the new mobile radios.
- b. With Option #1, installation will occur after system cutover and it will be necessary to move vehicles thru installation as rapidly as possible. Until this process is completed, some field units will be working on the existing Gen I radios and the remainder on the Next Gen radios simultaneously and seamlessly.
- c. With Option #2 and #3, installations will begin early, potentially at a slower, less intense pace. The radios will operate on Gen I system and replace the currently installed Gen I radios.
- d. Motorola has agreed to waive the additional cost to install remotely mounted radios, which are common in the current system, provided that MERA provides the needed cables (\$106.64 per vehicle for cables). These cables are required for vehicles requiring the radio be mounted separately from the control head, regardless of the option selected.
- e. Antennas: For early installation of dual band and tri-band mobile radios in a vehicle, the installers will retain the existing Gen I system antennas and will add a Next Gen system antenna. (Where needed, a VHF-high band antenna will also be added.) Staff feels that two or three separate antennas represents a better solution than a larger, bulkier multi-band antenna. The Gen I and Next Gen antennas are each under 6" in height and the VHF antenna is 19", while the multi-band antenna is bulky and approximately 28" in height and highly visible and can be subject to breakage in garages and around vegetation. After the transition to the Next Gen system, the Gen I antenna can remain until the vehicle is replaced, or optionally be removed and replaced with a rubber hole plug. At that time, only the new Next Gen antenna will be installed, unless the agency requires UHT-T band frequencies currently used in the Gen I system.

3. Effects of the Options - Portable Radios –

- a. In all cases, agencies can take advantage of the current radio offer to upgrade single band radios to dual band radios. These early order radios will be programmed as Gen I radios and reprogrammed to Next Gen radios at cutover. Tri-band radios are available with a local agency upgrade cost.
- b. Portable radios not ordered in this year's early orders would be purchased just prior to cutover as single band Next Gen radios. Agencies may choose to acquire dual or tri-band radios at local agency cost.

- c. Some fire agencies have inquired about using the dual band offer to acquire VHF-T and 700/800 MHz radios at this time. If they do, they will need to continue to use their existing radios until cutover and would not be able to use the MERA system until that time. Acquiring these UHF-T and 700/800 MHz radios will not affect cutover plans.

4. Effects of the Options - Radio Programming –

- a. In the original plan, Motorola was contracted to program each radio once. Early order radios, (including all mobile radios in Option #2 and #3), would require a second programming with technicians physically touching each radio to update their programming. The Communications Division has estimated the cost to reprogram all radios at \$130,000 and Motorola's vendor has estimated \$75,000 for each round of reprogramming.
- b. Over the Air Programming (OTAP) is an alternative that uses the MERA radio system to send new programming over the air to each radio sequentially. The end user then restarts their radio to implement the changes. Motorola has estimated that this process, when applied to all radios, could take a couple of weeks to complete. In most cases, it avoids the cost and time involved in having the technicians reprogram each radio in person. The cost of OTAP and the associated Radio Management software is \$350,000.
- c. Wi-Fi reprogramming is a third and newer option that would use a series of Wi-Fi hotspots to provide faster reprogramming. Assuming all radios have access to a Wi-Fi hotspot, reprogramming of the entire fleet of field radios could be completed in 12 hours. Motorola costs to enable Wi-Fi in the radios and to provide Radio Management software is \$503,889. Staff is still evaluating this technology and assessing potential costs to establish the Wi-Fi hotspots. Where possible, staff intends to use already existing infrastructure and access points. Marin County Communications and IT staffs are still exploring the efficacy and potential costs of this technology.
- d. Staff anticipates a hybrid approach, using Wi-Fi for field equipment and OTAP for desktop control stations. Based on our current estimate of radios, this hybrid model is quoted at \$523,556.43.
- e. At system cutover, encrypted radios will require a technician to provide the new Next Gen programming in person to enable the Next Gen encryption. However, all future programming changes could be wireless under OTAP or Wi-Fi. This would involve approx. 290 encrypted radios at approx. \$25.00 per radio or \$7,250.00.

5. Effects of the Options - Field Subscriber Equipment Discount –

- a. In the MERA contract with Motorola, Motorola offered a discount of \$500,000 if all subscriber equipment was delivered in December 2017. With the delays that the project has experienced, Motorola has agreed to maintain this discount under Option #3. Portable radios not upgraded under the dual band offer will be delivered in time for system cutover as single band radios.

- b. If sizeable number of portable radios are not upgraded, Motorola may delay a portion of the discount to final delivery, but the total amount of the discount would remain the same.

6. Effects of the Options - Schedule –

- a. Option #1 – Currently estimate Final System Acceptance is approx. April 2021. This includes a nearly yearlong cutover due to the vehicle installations and radio programming.
- b. Option #2 and #3 offer a potential for an 8-month reduction in that schedule (September 2020) due to early installation and programming. MERA Staff has estimated MERA monthly costs for Marin DPW, Federal Engineering, MERA Staff and Legal Counsel at approx. \$100,000 per month.
- c. Legacy System Support – Whatever time is saved on the Project schedule reduces the time MERA needs to support the Gen I system. The impact of this savings has not yet been quantified.

7. Effects of the Options - Warranty -

- a. Motorola has committed to not only honoring the normal equipment warranties for early ordered radios but will re-start their warranty period at final system acceptance.

8. Financial Impacts –

- a. System Discount – The \$500,000 discount described above for early delivery of all radios. This discount is preserved in option #3 and is currently scheduled to be withdrawn with either Option #1 or #2. This discount has been factored into our past budget discussions.
- b. Dual Band Offer – For Option #3, this is an approx. \$500,000 offer from Motorola, with a local agency cost for optional tri-band radios. In Option #1 and #2, this would require additional costs if dual band or tri-band is desired.
- c. Schedule impacts – As mentioned above. Staff estimates each month of Project overhead costs at approx. \$100,000 in MERA RGS, Marin DPW, Federal Engineering and legal costs. Options #2 and #3 potentially reduce the project schedule by 8 months.
- d. CEQA – The CEQA process has the potential to impact the project schedule, however delays due to CEQA, if any, will have minimal impact on these three options as system and cost impacts are all tied to the system cutover date that will be determined after CEQA.
- e. Cash Flow – Field equipment is invoiced when shipped. In the original schedule (Option #1) all field equipment would arrive in late 2020. In Option #2 and #3, equipment would arrive much sooner, as soon as June 2018 in Option #3. The Finance Committee would

need to assess those timing impacts as well as the additional costs in Option #2 prior to the 04/25/18 Governing Board meeting.

- f. Milestones – Subscriber equipment is not invoiced as one of the project milestones, but is invoiced upon shipment, so the radios ordered in Options #2 and #3 will not trigger a milestone payment to Motorola.

g. Cost Overview –

Option	#1 – No Action	#2 – 2019 Order	#3 – 2018 Order
System Discount	\$0	\$0	+ \$500,000
Dual Band Upgrade	Not needed	- \$500,000	\$0
Wi-Fi/OTAP/RMS	Optional	- \$525,000	- \$525,000
Project Costs	\$0	+ \$800,000	+ \$800,000
Technician Programming (Without OTAP/Wi-Fi)	- \$75,000 to \$130,000		

9. Early Order – Gen I Experience

- a. Many MERA members will remember that radios in the Gen I system were delivered but the installation was significantly delayed due to project land use issues.
- b. In Option #2 and #3 installations would begin immediately upon delivery so the radios can operate on the Gen I System until cutover. This was an option that MERA did not have in Gen I and is a key reason that we are interested in the dual band upgrade offer.