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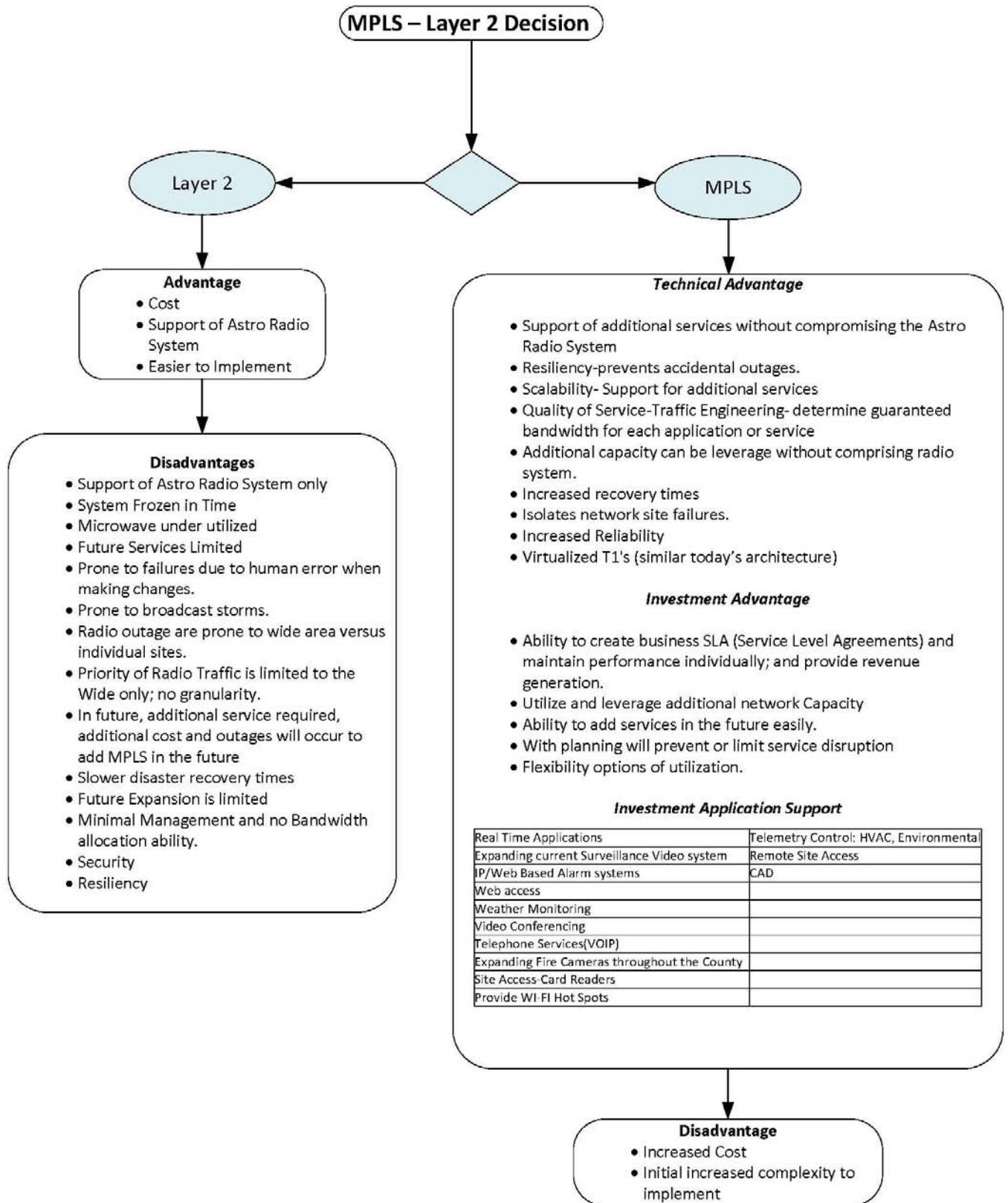
DATE: September 12, 2018
TO: MERA Next Generation Project Oversight Committee
FROM: Ernest Klock, Operations Officer
SUBJECT: AGENDA ITEM G: NextGen Project Motorola Contract Change Order #8
Multi-Protocol Label Switching (MPLS) for the Microwave Network

This Contract Change Order number eight (CCO#8) covers one item associated with the design of the microwave network for the MERA Next Generation Radio System (Nextgen System). The cost for CCO#8 is \$1,934,834.60, which does not include taxes on equipment at 9% for San Rafael estimated at \$29,797 for a total cost of \$1,964,631.60. A detailed description of the services, equipment, and associated costs are included in the attached CCO#8. Appendices A through C provide supporting documentation including post-warranty services (System Upgrade Agreement II - SUAII) scope and cost. Decisions on this item should be made prior to completing the NextGen System design, or additional costs may be incurred. The MPLS item was presented to the Operations Working group at the September 5, 2018 meeting and the members present indicated support for the recommendation to proceed with the CCO.

Item 1 - Multi-Protocol Label Switching (MPLS) for the Microwave Network - \$1,934,835

Replacement of the currently proposed Layer 2 network architecture with MPLS network architecture is proposed for the NextGen System microwave network to provide increased reliability, increased redundancy, and to ensure that non-LMR data services can continue to be provided for both MERA members and MERA non-member agencies (e.g, FBI & CHP Circuits, Cameras). A complete list of non-LMR connections carried over the existing microwave network is provided in Appendix A within CCO#8. This list has been created in conjunction with County Radio Communications staff, MERA staff, and Motorola. A deeper explanation of the differences in the technologies is provided by Federal Engineering in the attached letter dated September 5, 2018 (Attachment 1 herein).

The NextGen System Request for Proposals (RFP) specified Layer 2 as a replacement for the existing MERA T-band system. Motorola submitted a Request for Information (RFI) prior to bidding the contract to ensure MERA wanted to implement Layer 2 as this was not consistent with their experience in building other Bay Area radio systems. The response was to stay with Layer 2 for the Motorola contract as it was believed to be an acceptable replacement for the MERA T-band system and the most cost-effective approach. The presence of non-LMR traffic on the existing MERA microwave system was not clear during development of the NextGen System RFP and so accommodations for it were not considered. The following diagram is a comparison between the two technologies.



Layer 2 will function to carry voice radio traffic (small bursts of data) but cannot carry larger data packets such as non-LMR traffic without increased vulnerability - through feedback loops - to the NextGen System. Under the “feedback loop” scenario the NextGen System network could be overwhelmed by the data surge resulting in a widespread system outage. If MERA is to continue supporting the non-LMR sources and wishes to add non-voice services on the microwave network, then MPLS is necessary. Due to the increases in redundancy, reliability, and future flexibility for the NextGen System added by MPLS, this item is recommended.

Summary

If approved, CCO#8 will provide added redundancy and security for the NextGen System. This CCO scope includes all equipment, services, design, warranty and post-warranty services (SUAI) necessary to implement the items described for a total cost of \$1,934,834.60 after discounts. Decision and/or addition of this item needs to be made prior to the completion of the system design (currently approaching 50%) as making this decision at a later date could expose MERA to additional costs.

Attachment 1 – Federal Engineering Layer 2 vs. MPLS Letter dated September 5, 2018

Attachment 2 – Motorola Contract Change Order #8