



## **S T A F F   R E P O R T**

---

DATE: November 19, 2019  
TO: The Honorable Board of Supervisors  
FROM: Cody Snider, Information Services Division Manager  
RE: Draft Public Safety Microwave Radio Communications Network Cost of Ownership Model

---

### **Introduction**

As instructed by the Board of Supervisors during the October 22, 2019 meeting, Information Services staff have developed a draft total cost of ownership model for the Public Safety Microwave Radio Communications Network. This network serves County Sheriff, Countywide EMS and ambulance services, countywide fire departments, County Department of Transportation and various state and federal agencies.

The Board of Supervisors directed staff to develop a cost model that would summarize expected costs and then allocate those costs to agencies utilizing the service in an equitable manner. Below for Board of Supervisors consideration is a draft of the initial findings associated with a potential cost recovery model.

### **Cost Model Description**

In order to determine costs associated with running Mendocino County's radio and microwave equipment, staff first developed a standard unit of measure that would accurately reflect resource utilization. The primary function of the microwave is to provide data, whereas the radio equipment provides audio. The most compelling common denominator between the microwave and radio is the amount of space the equipment consumes, measured by Rack Units (RU). Each radio repeater takes up approximately 15RU and each microwave data connection takes up 9RU.

Once a costing methodology was developed, staff summed the total costs of operating the equipment. Those costs are comprised of equipment, site leases, utilities, labor (from both Executive Office/Information Services and Facilities Division staff), tower inspections, facilities related capital equipment and ongoing maintenance. The costs were then calculated over a 20-year span to match the longest equipment life cycle. The 20-year total cost of ownership was then used to calculate an annual cost.

**Equipment:** For equipment costs, staff considered the replacement cycle for site equipment, calculated an estimated \$19.7M outlay for equipment costs over the 20-year span.

**Real Property:** The County currently pays \$152,000 for site leases and receives \$6,300 in reimbursements in the form of sub-leases, for a total outlay of \$146,000 annually. These costs were then forecasted over the next 20 years, including applying a 3% increase per year to account for inflation and applied an average to the base model for a total of \$3.9M.

**Utilities:** In order to calculate utility costs, the average cost per site over the past three years was reviewed. At the Ukiah Low Gap, Courthouse Annex, Willits Justice Center and Fort Bragg Justice Center facilities, the utilities are not broken out from the entire location. For those locations, the average from the other sites was used to estimate a utility cost. The same 20-year forecast was applied to the utility costs for a 20-year total of \$1.4M.

**County Workforce/Labor:** For labor (Information Services and Facilities), staff used an average of the past seven years' project and labor tracking. An assumption of a 3% COLA over the 20 year span averaged out per site per year for \$2.28M over 20 years.

**Inspections:** The radio towers are required to be periodically inspected. Staff allocated \$687,000 for tower inspections based on a five-year inspection cycle at a cost of \$16,000 per inspection for each of the eight sites where the tower is county owned.

**Preventative Maintenance:** \$4.43M was added for ongoing site maintenance. These costs are for site maintenance, such as tree trimming, paint, and miscellaneous repairs. Staff allocated \$10,000 per site for fourteen sites where site maintenance is not part of the lease, and \$25,000 for maintenance at the Sanhedrin site due to the extreme weather conditions and historical wear at that site.

\$1.76M has also been included for the one-time facilities related projects that are needed to bring existing sites up to workable conditions. These project costs were presented to the board in the October 22, 2019 presentation.

**Total costs:** The 20-year total costs associated with running Mendocino County's radio and microwave equipment is \$42.03M, which equates to a \$1.56M yearly cost.

#### Cost Allocation Methodology

Taking the above factors into account, the cost per rack unit year was calculated to be \$1,196.

**Formula:** Each radio repeater requires 15RU space for a total annual cost of \$17,942. Since data is a required function of the whole microwave ecosystem, the costs were calculated at 9RU per microwave link over 17 sites for a total of \$183,006 per year. That total was then divided by the number of users to come up with a total of \$1,241 per year or \$103 per month.

#### Radio Cost Allocations by Agency

| Radio Repeater Users                   | Count | Year 1             |
|--|-------|--------------------|
| Anderson Valley Fire                   | 1     | \$17,942           |
| County Dept. of Transportation         | 4     | \$71,767           |
| County Fire Command (First Responders) | 11    | \$197,360          |
| County Fire Dispatch                   | 8     | \$143,534          |
| Ft Bragg Police                        | 1     | \$17,942           |
| Mendocino County Sheriff               | 16    | \$287,069          |
| Redwood Coast Fire                     | 1     | \$17,942           |
| Sonoma Control Medical/Fire Tac        | 6     | \$107,651          |
| Sonoma County Sheriff                  | 6     | \$107,651          |
| Sonoma REDCOM Fire/Medical Dispatch    | 2     | \$35,884           |
| South Coast Fire                       | 1     | \$17,942           |
| Ukiah Police                           | 4     | \$71,767           |
| US Forest Service Fire/Law/Admin       | 3     | \$53,825           |
| USAF Auxiliary Civil Air Patrol        | 1     | \$17,942           |
| <b>Total</b>                           |       | <b>\$1,166,218</b> |

Data Network Cost Allocations by Agency and County Department

| 2 Wire Audio Users                      | Count | Year 1          |
|---|-------|-----------------|
| Bureau of Land Management               | 2     | \$2,482         |
| CALFIRE                                 | 2     | \$2,482         |
| California Highway Patrol               | 2     | \$2,482         |
| County Dept. of Transportation          | 5     | \$6,204         |
| County Fire Command (First Responders)  | 3     | \$3,723         |
| County Fire Dispatch (First Responders) | 3     | \$3,723         |
| Dept. of Fish & Wildlife                | 2     | \$2,482         |
| Dept. of Parks and Recreation           | 2     | \$2,482         |
| Ft Bragg Police                         | 2     | \$2,482         |
| Mendocino County Sheriff                | 16    | \$19,853        |
| Ukiah Police                            | 1     | \$1,241         |
| <b>Total</b>                            |       | <b>\$49,633</b> |

| Data Users               | Count | Year 1           |
|--------------------------|-------|------------------|
| General Fund Departments | 75    | \$93,063         |
| HHSA                     | 117   | \$145,178        |
| Library                  | 20    | \$24,817         |
| External Agencies        | 69    | \$85,618         |
| <b>Total</b>             |       | <b>\$348,675</b> |

Cost Summary

| Agencies                   | Total Year 1       |
|----------------------------|--------------------|
| <b>County Departments:</b> | <b>\$647,951</b>   |
| Radio                      | \$358,836          |
| Data Network               | \$263,057          |
| 2 Wire Audio               | \$26,058           |
| <b>External Agencies:</b>  | <b>\$916,575</b>   |
| Radio                      | \$807,381          |
| Data Network               | \$85,618           |
| 2 Wire Audio               | \$23,576           |
| <b>Total</b>               | <b>\$1,564,526</b> |

Summary

The Information Technology Master Plan adopted by the Board in November 22, 2018 recommended the development of a Sustainability Plan for network infrastructure, microwave radio and other critical county systems. The above cost analysis outlines the costs, spread over twenty years, to sustain the Public Safety Microwave Radio System. Staff have allocated the annualized cost of the Public Safety Microwave/Radio System to The System users based on common denominators that fairly represent use.

It should be noted that staff created the above cost model based on direction given by the Board less than one month ago from this Board meeting. Final validation and some fine-tuning may be necessary to

improve the accuracy of certain costs. However, staff does not expect a final review to significantly alter the costs outlined above.

Staff requests that the Board, if it so desires, direct staff to:

- 1) Conduct a final review and analysis of cost inputs to increase the accuracy of the cost model.
- 2) Utilize the cost allocation methodology outlined above to present to the Board a final cost allocation model and recommended charge back and invoice amounts for County Departments and external agencies respectively.
- 3) Develop a plan to communicate potential cost allocations and rationale for doing so with County Departments, external agencies and other interested parties with an implementation goal of July 1, 2020.