**Proposed BayRICS Authority System Funding Plan**

## I.      BACKGROUND

Bay Area Wireless Enhanced Broadband (BayWEB) is a public-private partnership to build and operate a next generation, wireless broadband network for the 10-County Bay Area.  BayWEB will deploy a state-of-the-art 4G LTE (Long Term Evolution) wireless broadband network utilizing 700MHz spectrum reserved for public safety broadband use, and made available through a Federal Communications Commission (FCC) waiver granted to San Francisco, Oakland and San Jose.

BayWEB is governed by the Bay Area Regional Interoperable Communications System (BayRICS) Authority, a joint powers authority established in August 2011, comprised of representatives of seven Counties and three core cities making up the BayWEB geographic service area.  BayWEB will be a public-private partnership between BayRICS, regional public safety agencies and Motorola, funded through a $50,953,551 ARRA Broadband Technology Opportunities Program (BTOP) grant and $21,890,086 from Motorola in matching funds.  In addition, Motorola has agreed to pay additional costs of radio access network (RAN) site remediation costs, bringing the total project cost to approximately $97,000,000.

Under its joint powers agreement (JPA), the Authority must adopt a "Systems Funding Plan" prior to entering into any system agreement.  Section 2.05(d) also provides that the Systems Funding Plan should specify a means or formula for funding the design, construction, operation, maintenance, expansion, and lifecycle replacement of any systems that further the purposes of this Authority. In addition, Section 5.02(b) provides that the proposed plan shall be accompanied by a description of the Systems, and information to allow Members to determine the Systems' capability, data speeds, functionality, features, cost, financing and the expected impacts on individual Members.  The specific requirements of the Systems Funding Plan are addressed in Section II.

At the September 7, 2011 Authority meeting, an ad hoc sub-committee was established to oversee the development of a Systems Funding Plan for BayWEB.  This report describes a proposed plan for funding the Authority's participation in BayWEB, including projected costs of participation to Authority Member agencies, and a proposed three-year administrative funding plan.  In addition, this report provides a plan for BayLOOP, a point-to-point microwave system that will be used for BayWEB backhaul connectivity. For purposes of this Systems Funding Plan, BayLOOP is treated as a sub-system of the BayWEB system.

**Plan Highlights**

- The funding plan assumes a "pass-through" model, in which all Authority administrative costs that exceed the total amount of annual member fees collected would be passed on to user agencies as a surcharge added to the base user fee paid to Motorola.  Moreover, other costs specific to the BayWEB system, such as costs of billing, enhancing system coverage (roaming) or costs of backhaul are passed on to end-users whenever possible.  The plan assumes that the user surcharge be established at $5/user/month.  However, potential backhaul costs may require the Authority to consider increasing the surcharge to cover those costs.

- Most of the costs to Members identified in this report will apply only to agencies that actually load users on the system.  The BOOM Agreement with Motorola specifies that the Authority and its Members are not required to make minimum user commitments.  Therefore, if a Member commits no users, it will incur no user or device charges, and will not require back office connectivity or related costs.

- A Member that contributes radio sites to the system will incur site costs. However, the Member may control those costs somewhat through the site use agreement between the Member and Motorola. Only sites approved by the Member and specified in this site use agreement may be used in the system. If, for example, the lease cost for a site is found to be excessive, the agency and Motorola may choose to eliminate that site from consideration.

- Back office connectivity costs, *i.e.* the cost of connecting the dispatch center or public safety answering point (PSAP) to the core, will vary greatly from member to member. Back office costs will depend on the nature of the applications desired, the bandwidth required to operate those applications and the physical location of the facility to be connected. Therefore, this report does not attempt to estimate per-site or per-PSAP costs. Individual Members should estimate the costs to their agencies based on the circumstances of each individual facility.

- This report provides funding projections for the initial one-year period of system deployment and operation. User fees charged by Motorola may change annually after the first year, and roaming costs cannot be calculated with precision until after the coverage evaluation period, which will also occur during the first year of service. These and other costs may be projected to remain somewhat consistent in future years. A three-year projection of these costs has been developed in Attachment A.

This initial funding plan is designed to meet the requirements of the Authority JPA and provide members with a clear indication of the costs to Members and to the Authority resulting from the deployment of the BayWEB service. The Plan will be updated regularly during year-one, and at least annually thereafter, as more precise system revenue and cost data become available.

## II.     SYSTEMS FUNDING PLAN COMPONENTS

Section 2.04(d) of the BayRICS JPA Agreement identifies six components of a Systems Funding Plan:

1. *The design, construction, operation, maintenance, expansion and lifecycle replacement costs of the Systems.*

   Design and construction costs for the BayWEB middle mile network will be funded by Motorola though American Recovery and Reinvestment Act (ARRA) Broadband Technology Opportunities Program (BTOP) grant award of $50,953,551 and Motorola matching funds of $21,890,086.

   Backhaul costs of the network, if any, will be the responsibility of the Authority. These costs are discussed in section IV(2)(d) below.

   Operation and maintenance costs, except for costs related to billing and collection of fees from end users, will be the responsibility of Motorola. Motorola may recover the costs of operations and maintenance through user fees. User fees are described in detail in section IV(2)(c).

   Under the proposed BOOM agreement, any system expansion requests from Motorola require the approval of the Authority, and would presumably be funded by Motorola. System expansion requests from the Authority would be the responsibility of the authority and subject to the prior approval of the Board. No System expansion is anticipated in the initial three years of System deployment and operation.

   Lifecycle replacement costs would not be incurred until year 10 or later. Given the unknown technology landscape and user base over that time period, any attempt to estimate replacement costs at this time would be mere guesswork. The Committee

recommends that the Systems Funding Plan itself be refreshed at least annually and that a lifecycle replacement plan be phased in as more usage data becomes available and as new technology develops.

2. *Specification as to how site costs and/or site remediation (e.g., electrical, air conditioning, backup generators, and power) of specified antenna sites by jurisdiction shall be paid.*

Motorola has agreed to pay site remediation costs up to a $24 million ceiling throughout the BTOP grant period (August 2013). This is anticipated to cover all costs of site remediation. If new sites are desired after the BTOP grant expires, the Authority may be required to pay remediation for those sites. Site owners are responsible for some recurring site costs, such as electrical usage, lease costs and the value of staff time to escort Motorola staff on the sites. Site costs are described in more detail in Section IV(1)(b).

3. *The estimated costs to be borne by the Authority should ownership of the Systems later be transferred to the Authority.*

At the end of the 10-year term, Motorola will transfer the system to the Authority at no cost to the Authority. Therefore, similar to lifecycle replacement costs, costs of operating and maintaining the system will not be incurred until year 10. Although it is assumed that the Authority would continue to fund system operation through user fees, the speculative nature of the technology landscape and user base 10 years in the future makes any attempt to estimate such costs and revenues mere guesswork. The Committee recommends that the Systems Funding Plan itself be refreshed at least annually and that an ownership transition plan be phased in as more usage data and as new technology develops.

4. *Good faith estimates of costs and types of devices that will be able to operate on the Public Safety System*

Device descriptions and projected costs are described in section IV(2)(a).

5. *Monthly user fees for the Systems*

Monthly user fees for the systems are described in section IV(2)(c).

6. *Identification of additional funding sources, if necessary*

The Authority has identified $170,000 in funding for a General Manager/Project Management position in year one. It is anticipated that other funding sources may be desired to deploy additional backhaul solutions such as fiber loop redundancy, add additional sites, upgrade the system or adopt enhanced applications. Such potential funding sources should be identified and aggressively pursued throughout the initial years of the BayWEB system operation, and any additional funding sources will be included in annual revisions of the Systems Funding Plan.

In addition to the components set forth in Section 2.05(d), Section 5.02(b) also provides that the Systems Funding Plan shall be accompanied by a d*escription of the Systems, and information to allow Members to determine the Systems' capability, data speeds, functionality, features, cost, financing and the expected impacts on individual Members.*

The development of a final detail design is recognized to be an iterative process and will continue to be refined as the list of radio sites and backhaul facilities are finalized. A key

feature of the Systems Funding Plan is the document's flexibility. The Systems Funding Plan will be updated on a regular basis as design elements are finalized and enhanced. This document reflects the current version of the system description, and is a realistic guide to the expected costs and impacts on Members.  Current system description, specifications, functionality are highlighted in Section III.  System costs, financing and expected impacts are described in Section IV.

**III.**      **BAYWEB SYSTEM DESCRIPTION**

  **1.**  **Business Model Description (Highlights of the BOOM Agreement)**

- Motorola and the Authority will execute a 10-year build, own operate and maintain (BOOM) Agreement, and will then transfer the entire system to the BayRICS Authority at no cost.  The BOOM Agreement will govern use of spectrum, rates and service levels, upgrades and final transfer of the system to the Authority.

- Motorola will execute site use agreements directly with site owning jurisdictions; jurisdictions will pay no costs related to site remediation.  Jurisdictions must pay for site lease costs and utilities for the sites.

- Agencies have no obligation to purchase a minimum number of user accounts and Motorola assumes all risk of loading users on the system.

- Motorola will offer an introductory rate of $38/user/month for the first year of operation, and for subsequent years will maintain a rate that is driven from the commercial competitive market and is more affordable than rates for comparable services.  BayRICS Authority will review rates annually.

- Year-one basic features (as described in Motorola's "Option 2"):

    - Unlimited Data
    - Enhanced Quality of Service
    - P25 Push-to-Talk interface
    - Customer Enterprise Network Interface Options:
        1. Motorola Hosted Prioritization Service Manager (PSM) interface
        2. Agency Owned PSM interface

- The Authority will be responsible for all billing and collections, with start-up support from Motorola.  The Authority will consider adding a service fee to user bills to cover its cost of operation.

- The Authority will be responsible for backhaul connectivity to the BayWEB system core and for back office connections from agency enterprise networks to the core.  The BayLOOP sub-system will be used for backhaul where other options are not feasible.

- Roaming:

    - Motorola will provide reasonable technical assistance to the Authority concerning roaming services from that commercial carrier;

    - Users will be responsible for roaming charges both inside and outside the BayWEB service area.

- Users will be provided with a web-based application that will allow them to report system deficiencies on a real-time basis. Such deficiencies would include but not be limited to system performance and coverage. Motorola will accumulate this data in a format to be jointly determined by the JPA and Motorola. Motorola and the JPA will review the data on a regular basis. Such deficiencies may be the result of device functionality, backhaul capacity or system coverage. Solutions to be considered will include but may not be limited to: additional sites, enhanced backhaul, bi-directional amplification, device replacement or remediation, or roaming availability. The JPA and Motorola will jointly agree on the cost-effectiveness of the applied solution.

- System Design and Acceptance

  - System design:

    - Final System Design Detail will be developed over the next 60-90 days. All site agreements will include an "out clause" for jurisdictions to terminate site access commitment if final system design not approved by the BayRICS Authority

  - System design acceptance will require Technical Advisory Committee recommendation and ratification by the BayRICS Authority

  - Service level criteria specifying minimum coverage and bandwidth speeds will be incorporated into the executed BOOM Agreement

- Public Access System: Given the urgency of moving this agreement forward to the approving entities, the public access system BOOM agreement will be negotiated separately.


## 2. Technical and Operational Description

The BayWEB system design is still in development, but will comply with FCC coverage and bandwidth standards for the 4G LTE platform. The following highlights summarize the system description, design and technical features provided in the most current version of the BOOM Agreement.

**Technical Highlights:**

- Up to 193 eNodeB radio sites, operating on 700MHz public safety broadband spectrum (763-768 and 793-798 MHz)

- Enhanced Packet Core proposed location at Twin Peaks in San Francisco

- Backhaul: Hybrid 1Gbps microwave loop and BayLOOP with proposed fiber enhancements

- Compliant with FCC operability and interoperability standards, including:

  - LTE technology platform: 3GPP standard, E-UTRA, LTE Release 8 or higher adopted standards, must support QoS and specified LTE interfaces

  - Availability: The backhaul and network design will provide 99.99% uptime reliability at each eNodeB.

  - Anticipated Available Bandwidth (results of Cornerstone pilot study):

    - Near Cell: 16-19 Mbps Downlink; 6-7 Mbps Uplink
    - Mid-Cell: 11-15 Mbps Downlink; 2 Mbps Uplink
    - Cell Edge: 6-8 Mbps Downlink; .2-.3 Mbps Uplink

o   Current FCC required minimum 768 Kbps downlink and 256 Kbps uplink for a single user at the cell edge

- System must be capable of interconnecting with other regional public safety broadband networks.

IV.        **SYSTEM FUNDING**

This Section provides specific detail regarding all costs to the Authority and to Members for the BayWEB Project.  The following categories of costs have been identified:

1. Costs to All Members:
   a. Annual membership fee paid by members to the Authority;
   b. Site costs related to lease payments, access by Motorola and electrical utility charges;
2. Costs to Members with System  Users:
   a. Device costs;
   b. Member agency back office connectivity costs;
   c. User Fees, paid directly to the JPA:
      i. User fees charged by Motorola;
      ii. BayRICS Authority surcharge, which includes:
         1. Costs of billing user agencies on behalf of Motorola;
         2. Costs related to enhancing system coverage allocated to the Authority, including any roaming charges assessed to user agencies;
         3. Additional Administrative costs not covered by annual member fee
      iii. Backhaul Costs
3. Costs to JPA not passed on to members (funded from other sources):
   a. Costs of increasing capacity and performance of the system allocated to the Authority, for example adding additional fiber to the backhaul system

## 1.  Costs to All Members

### a.  Annual Membership Fee

All current Authority Members have paid an annual membership fee, as provided under Section 5.01 of the Authority's joint powers agreement.  For the initial year, this fee was set at $24,500.  For subsequent years, each Member shall pay an Annual Fee no later than July 1st of each Fiscal Year to maintain membership in the Authority.  The Board shall set this annual fee in an amount not to exceed the initial year membership fee, except that the Board may adjust the Annual Fee each Fiscal Year to reflect changes in the Consumer Price Index.

Public agencies that apply to become a Member after the Initial Membership Period, may be assessed a different membership fee.  The Board shall determine the amount of each subsequent member fee, which may be more, but cannot be less, than the initial membership fee paid by current Members.

This report assumes that the annual membership fee will remain at $24,500 per Member for the first three years of operation.

| Sub-total Annual Member Fee per Jurisdiction | $ 24,500.00 |
|---|---|

#### b. Site Costs

Although Motorola has agreed to pay all costs associated with site remediation and equipment installation operation and maintenance, each site owning jurisdiction will be responsible for on-going site costs such as lease costs, cost of electricity consumed by Motorola's equipment and staff time. Staff time may include one-time costs such as coordination of project implementation, construction permitting, environmental studies, attending community outreach meetings, as well as on-going costs such as security and escorting Motorola maintenance or service providers on site.

Sites will be approved to use for the system through independent site use agreements between the agency and Motorola. Thus, a Member agency may control those costs to some extent, by authorizing only sites that meet specified cost constraints set by the Member agency. For example, if the cost of leasing a site determined to be excessive, the agency and Motorola simply agree to eliminate that site from consideration and choose another.

With the exception of electrical usage (estimated to be $4,800 annually per site), site costs will vary greatly depending on whether third-party site owners will require lease payments. Sites owned by the agency, with no additional lease costs, may have no lease costs. Sites leased from third parties may require additional lease costs, which can range from $2,400 to $30,000 or more per year. Some jurisdictions have been successful in negotiating significant discounts for lease costs, or in bartering other facilities or services for lease rights.

Likewise, staff time and resources will vary considerably from site to site and agency to agency, therefore only general ranges for these costs are provided.

Therefore, with the exception of electrical costs, this report provides only general ranges of estimated site costs. Actual costs for each jurisdiction will vary according to the number of sites and the unique characteristics of each site.

| | |
|---|---|
| **Annual Electrical Costs per site** | $4,800 |
| **Annual Lease Costs per Site** | $0 - $30,000+ |
| **Annual Agency Staff Time and Resources** | $0 - $10,000 |
| **Total Annual Cost per Site** | $4,800 -$44,800+ |

#### 2. Costs for Members Using the Service

##### a. Device Costs

End user devices (EU) will be required for each user account. The cost of these devices is not included in the Motorola base fee or Authority surcharge. Member agencies will be responsible for the cost of these devices, which may be procured form Motorola or from any other vendor selling devices certified as compliant with network open standards requirements. In addition, it is possible that at some time in the future, the Authority may negotiate preferred rates, or identify other discounts or funding sources for devices, and offer them to Members.

Estimating the cost of devices is difficult because these devices are not currently available on the market. Preliminary information suggests that three types of devices may be available:

- "Dongle" type devices that plug into a laptop or similar computer;
- Handheld devices similar to smart phones or tablets (but without voice capability)
- Vehicular modems that would be installed in first responder vehicles

Pricing for these devices is not yet available, but is estimated to range from $450 - $1500 per device, with a three year life.  Members can expect the dongle devices to be priced at the low end of the range, and vehicular modems priced at the high end.  Handheld devices will be priced in the mid-range.  Therefore, Members with users on the system should estimate that costs of these devices based on their agency needs within this price range.  Unlike today's land mobile radios, the devices will not require programming; however vehicular modems will require installation and possibly some ongoing maintenance.

| End User Devices, per user, three-year refresh cycle | $450 - $1,500 |
|---|---|

### b.  Back Office Connectivity Costs

According to Motorola's preliminary system design:

> Each agency accessing the LTE network is required to provide a connection to the LTE Core. This connection enables the back office applications like email, internet access, database access such as NCIC, CLETS, etc. Motorola will work with each of the agencies to determine the required size of the backhaul based on the applications a particular agency plans on using on the network. Preliminary evaluations indicate that an agency with 1000 users would need a connection that supplies between 30 Mbps – 50 Mbps, however existing agencies using 3G services today use significantly smaller connections.

Back office connectivity costs for Member agencies using the service will vary greatly from Member to Member.  Member's back office costs will depend on the physical location of the facility that must be connected, the nature of the applications desired and the potential need to increase bandwidth connection at the facility.  These costs may be one time or recurring costs.

One Time Connectivity Costs.

Initial integration engineering costs will depend on the Member's existing ability to support data exchange with 911 core systems, and may include upgrades such database access, E-ticket, Video display monitors, VLPR, VoIP Telephone applications and the Internet.  As these costs are incurred only to the extent that a jurisdiction intends to utilize the system or specific applications on the system, such costs are not practical to estimate over the entire Membership.  Therefore, each Member must evaluate its current status, plans for use of the system and anticipated hardware and software needs.

Ongoing Connectivity Costs.  Member agencies will also be responsible for the cost of broadband connections from back room equipment to a designated demarcation point, where Motorola will assume responsibility for completing the connection to the core.  The agencies have several choices regarding the connection to the LTE Core including:

- Direct Connection between the Agency's enterprise network and the Core via microwave or third party fiber
- Connection at a third-party provider's aggregation point via microwave or third party fiber
- VPN connection through an ISP between the Agency and the LTE Core

Once again, these costs could vary greatly depending on the location of the PSAP, existing connectivity and bandwidth needs of the applications to be supported. Ongoing costs could be very low, in cases where the PSAP is already connected via broadband.  In cases where no broadband connection exists,

low-cost solutions are available such as cable modem or T1 service.  For example, Comcast Cable currently offers 50Mbps managed Ethernet service for $190.00/month, or 100Mbps for 370.00/month.  This service could used to connect the PSAP to a demarcation point through a private VPN.  Alternatively, AT&T will provide 1Gbps connection for approximately $2,000.00/month (probably more bandwidth than necessary).

The Authority is working with third party fiber and broadband providers to make no- or low-cost broadband access available to Members.  As with the one-time costs above, each Member must evaluate its current needs and plans when assessing these costs.

| One-time PSAP connectivity cost | Varies according to current status and future needs |
|---|---|
| Ongoing PSAP connectivity Cost | $0 – $4,440.00 per year |

### c.  User Fees Paid by Member Agencies

#### 1.  Motorola Service Fee

The BOOM agreement provides that Motorola will charge a flat fee of $38.00 per month per user for the first year of service, or until July 1, 2014, whichever occurs later.  After that date, Motorola may change the fee annually on July 1 of each year.  The amount of the fee shall be driven by the competitive "market rate" as determined by Motorola and reviewed by the Authority.  It is impractical to predict at this time whether the market rate for comparable services will increase or decrease.  Therefore, this report assumes that the rate will remain $38/user/month for the first three years of the agreement.

#### 2.  Authority Surcharge Fee

This report assumes a "pass-through" model, in which any Authority administrative costs that exceed the total amount of annual member fees collected would be passed on to user agencies in the form of a surcharge added to the base user fee paid to Motorola.  In addition, costs of billing and "roaming" (enhancing system coverage) allocated to the Authority under the BOOM Agreement would be passed on to end users.  This means that only Members with users on the system would pay billing, roaming and excess administrative costs.

Motorola has committed to provide support to the Authority for one-time startup costs of establishing a billing process.  It is anticipated that the ongoing costs of administering this billing will not be excessive.

Roaming costs will consist of "in-system" and "out-of-system" roaming.  Out-of-system roaming service and rates will be negotiated with third party providers and will be billed separately and passed on to the user.  These costs will only accrue when the user is operating outside of the BayWEB service area, for instance when providing mutual aid to an outside jurisdiction.  When other 700MHz public safety networks are deployed, inter-system roaming arrangements can be developed at no additional cost.

To address in-system roaming, Motorola and the Authority have agreed to a one-year evaluation period in which coverage and performance are tested, coverage gaps identified and solutions proposed.  The parties intend for third party roaming agreements to be the "last resort" after other solutions are applied and found to be lacking.  Therefore, roaming costs may not materialize until the second year of service, after other solutions are attempted.  Thus, these costs are impractical to estimate until this evaluation process can occur.

For these reasons, staff recommends that the Authority set a surcharge for each user at a year-one rate of $5/user/month.  The surcharge will be revised annually based on a review of the actual revenues and

expenses for the prior year, and the need to add coverage or roaming enhancements.  For example, if, at the end of year one, the Authority's actual cost per user is found to be only $4/month and no coverage enhancements or roaming is required, the surcharge for year two would be reduced to reflect actual revenues and costs for the prior year.  Any surplus revenues collected by the Authority could be applied to reduce the current year surcharge, or could be held in a reserve fund for future system enhancements.  JPA staff would implement cost saving measures to make best efforts to ensure that the surcharge remains affordable.

**Summary of Member User Fees**

| Per User Motorola Annual Base Service Fee (Year One $38x12) | $456 |
|---|---|
| Per user Authority Surcharge (Year One $5x12)) | $60 |
| Per User Total Annual Service Fees | $516 |

Authority Administrative Costs:  General administrative costs associated with operating a joint powers authority include staffing, bookkeeping and accounting, legal representation, insurance and office/miscellaneous expenses.  In addition, the Authority will incur specialized expenses such as cost and legal advice related to the 700MHz spectrum lease, and telecommunications specific technical consulting services.  Annual Membership fees are anticipated to cover some, but not all of these expenses.  Excess administrative expenses not covered by the annual fee will be passed on to users as part of the Authority surcharge.

This report assumes 15 Authority Members and 2,000 system users at the end of the first year of system operation, 4,000 users at the end of year two and 6,000 users at the end of year three.  However, the system will not begin loading users until mid-year (June or July) of 2012.  Therefore, user surcharge revenues are expected to be very low for year one.  To fill this gap, the BAY Area UASI has agreed to support the Authority with a one-year funding of $170,000 in 2012.  In addition, staff anticipates that an additional $85,000 may be available for the UASI in 2013, to fund the project through the build out phase.

Attachment B provides a tentative budget for Years One, Two and Three estimated administrative expenses and revenues.  Although the Authority will operate on a July – June Fiscal Year, for simplicity's sake, these administrative budgets are based on a calendar year.

### 3. Backhaul Costs

Under the current version of the BOOM Agreement, the Authority is responsible for backhaul costs.  The current design of BayWEB relies on a hybrid backhaul connectivity plan.  This configuration incorporates municipal fiber, BART fiber, BayLOOP and point-to-point microwave links to create a viable backhaul network.  Each of these backhaul alternatives has been evaluated by Motorola and has been found to meet minimum bandwidth requirements for backhaul usage.  The consensus is, however, that fiber backhaul is the preferred solution.

Several backhaul options are being evaluated by the Authority, including:

- Municipal Fiber.   One or more Member agencies intend to contribute dark fiber.  Dark fiber and other backhaul facilities will be treated similar to sites, so the contribution will not result in a cost to the Authority, but may result in costs to the contributing Member.

- BayLOOP. BayLoop is a Microwave Radio System which circles the Bay Area Region connecting 18 radio sites located in eight counties.  BayLoop consists of two OC3's, one which is dedicated to carry BayWEB Broadband Traffic with the throughput of 155 mbps.  The second OC3 supports channelized traffic with the capacity of supporting up to 84 T1's. BayLoop is intended to provide the wide area connectivity to support Information Sharing and Voice Systems throughout the Bay Area Region and beyond.

  The UASI Interoperability Working Group and TAC are currently studying BayLOOP costs and potential revenues.  One proposal indicates that maintenance services (technical support, repair services, onsite corrective maintenance and preventive maintenance) and remote monitoring will cost approximately $265,000 annually.  In addition, some TAC members believe that additional annual support costs would raise this annual estimate to $500,000.  TAC has not provided details for these additional costs.

  To secure BayLOOP for use as backhaul, staff proposes that Authority should negotiate continuing arrangements with the 8 counties currently supporting BayLOOP to continue this relationship for Year One (2012). Beginning with Year Two (2013), the Authority should begin a transition plan to assume operational responsibility for BayLOOP in phases over the next two years (2013-2014).  This transition plan should also include a revenue component to charge agencies for uses of BayLOOP not related to BayWEB.  The goal of the Authority should be to make BayLOOP self-supporting through BayWEB and other agency uses.

- BART Fiber. BART fiber is viewed as an essential element in the success of the BayWEB project. Staff are currently engaged in discussions with BART to develop a MOU that results in no cost to the Authority.  Recent discussions suggest that this MOU can be developed using creative terms that will result in $0 cost to the Authority.  If, however, BART fiber results in a significant cost, the Authority must approve the cost and determine the best method of recovering that cost.

- Other Backhaul Alternatives.  Other entities may have fiber and other backhaul alternatives that can enhance the current backhaul design.  Such entities may include CENIC, commercial fiber providers, cable operators and wireless carriers.  The Authority should continue to conduct research aimed at identifying low-cost backhaul solutions and enhancements.

At this time, accurate backhaul costs are uncertain.  As Motorola's system design is finalized, specific backhaul responsibilities are identified and third party providers are secured, these costs, if any, can be estimated with more accuracy.  If significant backhaul costs arise, the Authority has limited resources to pay these costs.  The proposed administrative funding plan has identified revenues for years one-three that would provide some funding for backhaul:

| Year 1 | $78,000 |
| Year 2 | $218,000 |
| Year 3 | $263,495 |

The Authority should consider aggressively seeking out other funding sources to pay future backhaul costs.  Available options include:

- Increasing the surcharge to users. The Authority could, for instance, increase the monthly surcharge from $5 to $10 per month, to pay backhaul costs.  The Authority should, however, carefully consider the effect of this increased surcharge and whether revenues from such increases would be offset by reduced user counts from fewer subscribers willing to pay higher

monthly fees. Staff does not recommend increasing the surcharge beyond $5/month without real market data.

- Assessing the additional cost as a supplemental member fee.  However, the Board may not increase the annual member fee by more than the Consumer Price Index (CPI) each year without amending the JPA agreement, which requires a unanimous vote of the Board and adoption of the changes by Member agencies.

- Identifying other resources, such as grants or additional partnerships with third party fiber providers.

### 3. Other System Costs, Including Backhaul Enhancements

After system activation, it may become apparent that backhaul enhancements will be required to increase bandwidth for certain parts of the region, add preferred applications or refresh system components.  For example, it may become advisable for the Authority to invest in additional fiber capacity to enhance network capacity or resiliency.  In that case, the Authority would need to identify additional funding sources or models to pay for such improvements.  The Authority could look to grant funding, or various cost sharing models to address such needs, if and when they occur.  At present, such costs remain speculative and therefore are not addressed in detail in this report.

**Total Estimated Cost to Members**

Due to the significant variance of costs among sites, user levels, connectivity and system application for individual agencies, a total cost of participation cannot be calculated.  This report provides one-year cost projections for those cost categories that may be estimated with a fair degree of certainty, and ranges of possible costs for those categories that are less certain.  In some case however, costs are extremely location- or jurisdiction-specific.  Members should consult with their staff to properly calculate those costs for their jurisdictions.

Many of the costs identified in this report are projected to remain somewhat consistent in future years. A three-year projection of certain costs in included in Attachment A.

**ATTACHMENT A**

**Three Year Cost Estimates**

## Attachment A: Administrative Funding Plan
### Estimated Costs for Jurisdictions Participating in BayWEB
### Years One - Three

| ITEM | UNIT COST $ | COST TIMEFRAME | Notes |
|---|---|---|---|

**1. COSTS TO ALL MEMBERS**

### a. Annual Membership Fee Paid by Members to the Authority

| ITEM | UNIT COST $ | COST TIMEFRAME | Notes |
|---|---|---|---|
| | $24,500 | Annual | Assumes that the annual membership fee will remain at $24,500 per Member for the first three years of operation. |

**Sub-total Membership Costs per Jurisdiction, Year One Through Three = $73,500**

### b. Site Costs (Motorola will execute site use agreements directly with site owning jurisdictions)

| ITEM | UNIT COST $ | COST TIMEFRAME | Notes |
|---|---|---|---|
| Electrical | $4,800 / site | Annual | Cost of electricity consumed by Motorola equipment. Monthly usage rate based on equipment specifications. |
| Site lease | $0 - $30,000+ / site | Annual | For sites that jurisdictions don't already own or that face increased lease costs. Costs will vary greatly depending on whether third-party site owners require lease payments. Includes engineering studies or lease application fees. |
| Staff time | $0 - $10,000 / site | One-time and annual | May include one-time costs such as coordination of project implementation, construction permitting, and environmental studies, as well as on-going costs such as security and escorting Motorola maintenance or service providers on site. Costs will vary from site to site and agency to agency. |

**Sub-total Costs per Site, Year One Through Three = $14,400 - $134,400**

## 2. COSTS TO MEMBERS WITH USERS

### a. Device Costs *(Jurisdictions may purchase devices from Motorola or another compliant vender; jurisdictions incur costs only if and to the extent that agencies elect to purchase devices)*

| | | | |
|---|---|---|---|
| Dongle and handheld devices and/or vehicular modems | $450 - $1,500 per device | One-time, every three years | Devices are not currently available on the market and so costs are hard to estimate.  Dongles will be priced at the low end, handhelds in the mid-range, and vehicular modems at the high end. |
| Vehicular modem installation and maintenance | | | |

**Sub-total Costs _per Device_, Year One Through Three = $450 - $1,500**

### b. Member Agency Back Office Connectivity *(Jurisdictions incur costs only if and to the extent that they utilize the system or specific applications on the system)*

| | | | |
|---|---|---|---|
| One-time PSAP connectivity | *na* | One time | Initial integration engineering costs depend on Members' ability to support data exchange with 911 core systems; may include upgrades such as database access, E-ticket, Video display monitors, VLPR, VoIP Telephone systems, and Internet. |
| Ongoing PSAP connectivity | 0 - $4,400 / PSAP | Annual | Includes broadband connections from back room equipment to a designated demarcation point. Costs will vary depending on location, existing connectivity, and bandwidth needs of the applications to be supported. |

**Sub-total Connectivity Costs _per PSAP_, Year One Through Three = Costs dependent on circumstances of each individual facility**

*c. __User Fees__ (Motorola will execute service agreements directly with user agencies; jurisdictions incur costs only if and to the extent that agencies elect to use services. Members pay user fees directly to the JPA.)*

| | | | |
|---|---|---|---|
| User fee charged by Motorola | $38/ user/ month | Annual | User fees charged by Motorola will change annually after the first year.  For purposes of this report, an estimate of $38/ user/ month is used for year one through three. |
| BayRICS Authority surcharge | $5/ user/ month | Annual | Includes costs of billing, roaming, and excess administrative expenses not covered by the annual membership fee (see Attachment B).  In-system roaming costs cannot be calculated with precision until after the coverage evaluation period, which will take place during the first year of service.  The surcharge will be revised annually based on a review of the actual revenues and expenses for the prior year and the need to add coverage or roaming enhancements. |
| Backhaul | 0 - $500,000 | Annual | The JPA is currently evaluating backhaul options (e.g., municipal fiber, BayLOOP, BART fiber).  If significant backhaul costs arise, the JPA has some, but limited, resources to pay these costs.  As Motorola's system design is finalized, specific backhaul responsibilities are identified, and third party providers are secured, backhaul costs - if any - can be estimated with more accuracy. |
| **Sub-total Fees _per User_, Year One Through Three (not including backhaul) = $1,548** | | | |

**ATTACHMENT B**

**ADMINISTRATIVE FUNDING PLAN**

**Years One - Three**

**Year One (1/1/2012 – 12/31/2012)**

| Expenses | | |
|---|---:|---:|
| Administrative Staff: | | |
| 1 FTE ED/Project Manager | | |
| .5 FTE Billing Clerk | | |
| .5 FTE Admin. Assist. | | $250,000 |
| Bookkeeping/Accounting | | $7,500 |
| Legal Services | | |
| General Legal (12 months x $5,000/m) | | $60,000 |
| FCC Waiver | | $100,000 |
| Technical Consulting | | $28,000 |
| Spectrum Lease | | $15,000 |
| Insurance | | $10,000 |
| Miscellaneous Expense | | $17,000 |
| Backhaul Costs | | **$78,000** |
| **TOTAL Expenses** | | **$565,500** |
| **Revenues** | | |
| Memberships | 15 | $24,500 | | $367,500 |
| Authority Surcharge | 2,000 | $60 | | $28,000 |
| BAUASI Funding | | | | $170,000 |
| **Total Revenues** | | | | **$565,500** |

**System Loading by Month: 2012**

| 2012 | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov | Dec | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Users | 0 | 0 | 0 | 0 | 0 | 100 | 200 | 400 | 700 | 1000 | 1200 | 2000 | |
| Surcharge | $0 | $0 | $0 | $0 | $0 | $500 | $1,000 | $2,000 | $3,500 | $5,000 | $6,000 | $10,000 | $28,000 |

**Year Two (1/1/2013 – 12/31/2013)**

| Expenses | | |
|---|---|---:|
| Administrative Staff: | | |
| 1 FTE ED/Project Manager | | |
| .5 FTE Billing Clerk | | |
| .5 FTE Admin. Assist. | | $250,000 |
| Bookkeeping/Accounting | | $7,500 |
| Legal Services | | |
| General Legal (12 months x $5,000/m) | | $60,000 |
| FCC Waiver | | $40,000 |
| Technical Consulting | | $28,000 |
| Spectrum Lease | | $15,000 |
| Insurance | | $10,000 |
| Miscellaneous Expense | | $17,000 |
| **Backhaul Costs** | | **$218,000** |
| **TOTAL Expenses** | | **$645,500** |
| Revenues | | |
| Memberships | 15 | $24,500 | | $367,500 |
| Authority Surcharge | 4,000 | $60 | | $193,000 |
| BAUASI Funding | | | $85,000 |
| **Total Revenues** | | | **$645,500** |

**System Loading by Month: 2013**

| 2013 | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Users | 2200 | 2400 | 2600 | 2800 | 3000 | 3200 | 3400 | 3600 | 3700 | 3800 | 3900 | 4000 | |
| Surcharge | $11,000 | $12,000 | $13,000 | $14,000 | $15,000 | $16,000 | $17,000 | $18,000 | $18,500 | $19,000 | $19,500 | $20,000 | $193,000 |

**Year Three (1/1/2014 – 12/31/2014)**

| Expenses | | |
|---|---|---|
| Administrative Staff:<br>1 FTE ED/Project Manager<br>.5 FTE Billing Clerk<br>.5 FTE Admin. Assist. | | $250,000 |
| Bookkeeping/Accounting | | $7,500 |
| Legal Services | | |
| General Legal (12 months x $5,000/m) | | $60,000 |
| FCC Waiver | | $40,000 |
| Technical Consulting | | $28,000 |
| Spectrum Lease | | $15,000 |
| Insurance | | $10,000 |
| Miscellaneous Expense | | $17,000 |
| **Backhaul Costs** | | **$263,495** |
| **TOTAL Expenses** | | **$680,995** |
| Revenues | | |
| Memberships | 15 | $24,500 | | $367,500 |
| Authority Surcharge | 4,000 | $60 | | $313,495 |
| BAUASI Funding | | | | $0 |
| **Total Revenues** | | | | **$680,995** |

**System Loading by Month: 2014**

| 2014 | Jan | Feb | Mar | Apr | May | June | July | Aug | Sept | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Users | 4200 | 4400 | 4699 | 4800 | 5000 | 5200 | 5400 | 5500 | 5600 | 5800 | 6000 | 6100 | |
| Surcharge | $21,000 | $22,000 | $23,495 | $24,000 | $25,000 | $26,000 | $27,000 | $27,500 | $28,000 | $29,000 | $30,000 | $30,500 | $313,495 |