

## **7.0 APPLICATION EVALUATION PROCEDURES**

The Arizona Regional Review Committee will review and evaluate each request based on the sufficiency of the information required in the following:

### **7.1 System Design**

A brief statement of the intended use of the requested frequencies and how they will be integrated into the existing emergency and non-emergency operations will be required. The efficiency of 800 MHz frequencies depends greatly upon the design and programming of the system itself to assist all public safety users in making all systems operate in an efficient manner. This is the reason this area is being included for review. Specific criteria regarding system parameters are in the section, "System Technical Design Requirements." (See 9.0)

Below are the different requirements for the system design. Additional detail follows, including sample calculations.

#### Listing of System Coverage and Service Area:

- Antenna height and power
- Definition of service area
- Calculation of service area
- Provide service area exhibit (map)
- Listing of control stations
- Frequency re-use
- Adjacent channel design
- Trunking requirements
- System loading requirements
- System engineering exhibit
  - Transmit output power
  - Type of intermodulation equipment and losses
  - Type of transmission lines and losses
  - Antenna model and gain
  - Ground elevation above mean sea level
  - Antenna centerline AGL
  - Height above average terrain of antenna centerline
  - Effective radiated power (ERP)
  - PSTN interconnect

### **7.2 Funding Statement**

The applicant's commitment to implement the system ensures maintaining the efficient utilization of these 800 MHz frequencies. The funding statement, which will be a resolution from the applicant's governing

body, will include the method by which the system will be funded.

### **7.3 Implementation Schedule**

The applicant will be requested to furnish a schedule detailing the time period required to implement the proposed communication system, from funding through turn-on and final acceptance. Also indicate if "slow growth" is required.

All agencies applying for frequencies in the 800 MHz bands shall submit a letter of intent from the agency's Chief Administrative Officer verifying a fiscal and engineering commitment to the implementation and construction of a radio system within the parameters listed below:

- Submit to APCO/FCC coordination request and license application.
- Issuance of the RFP - 12 months after licensing.
- Award of contract - 24 months after licensing.

The Regional Review Committee anticipates that not all agencies or jurisdictions with allotted channels in the Plan will construct systems. The Regional Review Committee also recognizes that some agencies or jurisdictions may require more channels than are allotted in the Plan. The Plan envisions and the Regional Review Committee insists on a good faith showing of the intent from all agencies and jurisdictions with allotted channels. Therefore, channels will be considered available for allocation if licensing has not been initiated or specific plans have not been filed with the Regional Review Committee. The Plan has been in effect since September 1991. The Regional Review Committee considers this sufficient time for agencies and jurisdictions to have developed a long-range plan for use of these channels and to have provided notification to the Regional Review Committee.

### **7.4 Justify the Number of Channels**

The following criteria shall be used to justify the number of channels requested:

- Population statistics that are substantial and projected trends that indicate the growth per year.
- Statistics on numbers of radio equipped personnel in the field at one time, both currently and projected, based on population growth statistics or other qualified factors such as traffic analysis.
- The applicant's request must meet FCC rules for channel loading.

### **7.5 Existing Frequency Statement**

The applicant will provide an explanation of how existing frequencies will be used by the applicant and a listing of the frequencies (give backs) to be released for re-use. Time frames for the release of frequencies

for reassignment should be included in the implementation schedule submitted with the request.

Commitments to release channels shall become part of the Regional Plan and released channels shall be assigned to qualified agencies in accordance with the National/Regional Plan commitments. Letters of commitment must be provided by the applicant giving up the frequencies to the ARRC. Reassignment to give back frequencies will be made part of the plan.

### **7.6 Evaluation Criteria**

The criterion, when instituted, incorporates a filing window concept, which will provide for the evaluation of all applications for available spectrum within a set time period. The evaluation is a sequence of events that will be followed in the allocation of the six-megahertz of 800 MHz spectrum. This process follows the guidelines established under the National Plan.

The allocation is placed in the frequency pool. If frequencies are available in the pool (a second iteration of the evaluation could occur if all frequencies are not allocated on the first iteration), a window-opening announcement is made. The first window period will be thirty days with late applications rejected. The second window will open upon completion of processing of applications received in the first window period. Applications are received and reviewed during the window period. The evaluation will result in the award of a score for each application. That score is the total of the points awarded in seven categories, with a maximum possible score of 1000 points.

The six categories are as follows:

1. **Service (maximum score, 350 points).** Each of the eligible services has a predetermined point value. That point value is multiplied by ten (10) to determine the score for the Service Category. An applicant with multiple services will be scored on the basis of the percentage that each service represents of his total system. That is, a system that is 50 percent police and 50 percent local government (school administration) would be awarded the total of 50 percent of the point value for police plus 50 percent of the point value for school administration.
2. **Intersystem Communications (maximum score, 100 points).** The application is scored on the degree of interoperability that is demonstrated, with a range of points from 0 to 100. This category does not rate the application on the inclusion of the mandated five common channels for interoperability. This category does rate the application on its proposed ability to communicate with different levels of government and services during times of emergency.
3. **Loading/Geographic Efficiency (maximum score 200 points).** Those applicants that have demonstrated that they are part of a cooperative, multi-organizational system and show Geographic Efficiency will be scored on a range of 0 to 150 points depending on the extent of cooperation and Geographic Efficiency; the ratio of mobiles to area covered and the channel reuse potential. The ratio of mobiles to area covered measures the level of Geographic Efficiency that a system demonstrates. The higher the ratio (mobiles divided by square miles of coverage), the more efficient the use of the frequencies. An expansion of an existing 800 MHz system will be scored on a range of 0 to 50 points, depending upon the degree of expansion. A

system could be an expansion of an existing 800 MHz cooperative system, and show a high ratio of Geographic Efficiency, which could result in receiving the combined point value for a maximum value of 200 points.

4. **Spectrum Efficient Technology** (maximum score, 100 points). This category scores the application on the degree of spectrum efficient technology that the system demonstrates. A point value range of 0 to 100 points can be awarded for this category. A trunked system would be considered a "spectrum efficient technology" as well as any technological systems feature that is designed to enhance the efficiency of the system and provide for the efficient use of the spectrum.
5. **Systems Implementation Factors** (maximum score, 50 points). This category scores the application on two factors, budgetary commitment and planning completeness. The degree of budgetary commitment is scored on a range of 0 to 25 points. An application that demonstrates a high degree of commitment in funding the proposed system will receive the higher score. Each application will be scored on the degree of planning completeness with a range of scoring from 0 to 25 points. Applications must include a timetable for the implementation of the communications system or systems.
6. **Give backs** (maximum score, 200 points). The application is scored on two factors: the number of channels given back and the extent of availability of those channels to others. The greater the number of channels given back, the higher the score will be, with a range of 0 to 100 points. The greater the availability of the "give backs", the higher the score will be for this factor, up to a maximum of 100 points. This point system will depend on whether the "give back" frequency is a co-channel frequency or if the "give back" frequency is a single user. The applicant shall submit a letter indicating frequency(s) being given back, authorizing signature, and date that the "give back" frequency(s) will take effect.

Points are totaled for each application and the applications are prioritized by the Arizona Regional Review Committee. The frequency pool is allocated and the Arizona Regional Plan is updated to reflect the frequency assignments.

System implementation is monitored by the Arizona Regional Review Committee, which determines if progress is being made. If progress is not made, the licensee is warned of the consequences of his lack of progress. If continued monitoring indicates that sufficient progress is still not being made, the Federal Communications Commission (FCC) may be notified of the non-compliance and the licensee will be notified by the FCC of pending action that may result in withdrawal of their license. The notified licensee can appeal this action or can allow the license to be withdrawn. If the allocated frequencies are withdrawn, they are added back to the frequency pool.

### **7.7 Appeal Process**

Throughout the frequency allocation process, applicants are given the opportunity to appeal decisions, which have caused rejection of their application. The appeal process has two levels: the Arizona Regional Review Committee (ARRC) and the Federal Communications Commission (FCC). An applicant who decides to appeal a rejection should file the appeal with the ARRC within 45 days from notification of

rejection. If the applicant is not satisfied with the ARRC's final decision based on the appeal, the applicant may file an appeal with the FCC. The FCC's decision will be final and binding upon all parties.

### 7.8 Service Point Rating

	Minimum Value	Maximum Value
Local Government		
Transit Systems	5.0	30.0
Utility Operations	5.0	30.0
School Boards	0.0	20.0
Administration	0.0	25.0
Maintenance	5.0	25.0
Security	5.0	25.0
Other	0.0	25.0
Primary Police	35.0	35.0
Fire	35.0	35.0
Highway	10.0	30.0
Forestry Conservation	10.0	35.0
Fire	15.0	35.0
Medical Services		
Hospitals	0.0	20.0
Invalid Coach	0.0	20.0
Physicians	0.0	10.0
Rescue – BLS & ALS	30.0	35.0
Physically Handicapped	0.0	20.0
Veterinarians	0.0	5.0
Disaster Relief Org.	5.0	20.0

**7.8 Service Point Rating (cont.)**

<b>School Buses</b>		
<b>Private Under Contract</b>	0.0	10.0
<b>Municipal Operated</b>	0.0	20.0
<b>Part of OEM EVAV</b>	5.0	20.0
<b>River/Lake/Beach Patrols</b>	0.0	30.0
<b>Isolated Areas</b>	0.0	15.0
<b>Communications</b>		
<b>Standby Facilities</b>	0.0	25.0
<b>Repair of Facilities</b>	0.0	25.0

## **8.0 EXISTING FREQUENCIES**

The Arizona Regional Plan encourages the surrendering of existing frequencies in the VHF and low UHF range by applicants for the 800 MHz spectrum. The ARRC will prioritize applicants for surrendered VHF and low UHF frequencies. This committee will then recommend any available frequency for the use of the highest priority applicant. This recommendation must be consistent with the frequency's normal service category, the applicant's eligibility within that service, and the technical way in which the frequency will be used. The ARRC will recommend approval of the license application by the appropriate frequency coordinator.

The ARRC will evaluate applications based upon the criteria established in Part 47 CFR, Part 22.504 and Part 90 of the Federal Communications Commission Rules and Regulations.

### **8.1 General Re-assignment Philosophy**

Because of the demographic and geographic makeup of Arizona, the Arizona Region Plan encourages the following general frequency usage:

- a. 150-160 MHz: For reassignment in rural, varied topography, wide area applications. Discourage long term usage in the Phoenix Metropolitan Statistical Area (MSA).
- b. 450-470 MHz: For reassignment primarily within the MSA and wide area systems. Usage at high elevations and high effective radiated power outside of the MSA, where there is a high potential for interference to those within the MSA is to be discouraged with the exception of wide area services.
- c. 800 MHz: It is felt that few existing frequencies at 800 MHz will be surrendered. Also, because of propagation characteristics and the technical criteria for frequency reuse at 800 MHz, these frequencies will be treated the same as all other 800 MHz frequencies in their assignment.
- d. Frequency usage within the MSA is to be encouraged within the 450-470 MHz and 800 MHz allocations.

### **8.2 Point System Overview**

The Arizona Regional Plan establishes a system for assigning points in order to prioritize applications for reassignment of surrendered frequencies. A total of 575 points are possible. The components of the point total are dependent upon:

- a. Minimum antenna height above average terrain.
- b. Minimum use of effective radiated power.
- c. Minimizing coverage outside the area of operation.

- d. Use of patterned antennas.
- e. Location of the transmitter in relation to the applicant's area of operation.
- f. Frequency band in relation to the MSA.
- g. The size of the area of operation.
- h. Frequency usage as control, mobile, base, or mobile relay.
- i. The population of the political jurisdiction making the application.

### 8.3 Prioritizing Point System

Criterion	Methodology	Maximum Points
Antenna height above average terrain (HAAT)	Optimum HAAT divided by design HAAT times 50. (See Note 1.)	50
Effective Radiated Power (ERP)	Optimum ERP divided by design ERP times 50. (See Note 2.)	50
Coverage	Area of Operations divided by Reliable Service Area times 100. (See Note 3.)	100
Radiation Pattern	Area of Operations sector width, in degrees divided by the total sector covered by the antenna system, times 75.	30
Location	Subjective evaluation of the selected site with respect to the intended operating area.	30
Loading	1 point per unit.	70
Sharing	25 points per entity or service (Police, Fire, LG.).	100
Band Plan	VHF outside MSA. UHF inside MSA.	100 100

**8.4 Band Plan**

Case 1. The frequency is within the low UHF range - if the station:

<u>Criterion</u>	<u>Raw Points</u>
a. will be used primarily or wholly within the MSA,	8
b. will be used as mobile only or mobile/control,	7
c. has an area of operation less than 500 square miles,	6
d. jurisdiction serves a population fewer than 50,000,	5
e. jurisdiction serves a population more than 50,000,	4
f. has an area of operation more than 500 sq mi.	3
g. is used as base station or mobile relay,	2
h. is outside of the MSA.	1

Case 2. The frequency is within the VHF band - if the station:

<u>Criterion</u>	<u>Raw Points</u>
a. will be used primarily or wholly outside of the MSA,	8
b. will be used as mobile only or mobile/control,	7
c. area of operation is more than 500 square miles,	6
d. jurisdiction serves a population of more than 50,000,	5
e. jurisdiction serves a population of fewer than 50,000,	4
f. area of operation is less than 500 square miles,	3
g. is used as a base station or mobile relay,	2
h. is used primarily or wholly within the MSA.	1

In order to accentuate band propagation characteristics in this prioritizing process, a weighted schedule will be used. The maximum number of raw points is 26 and the minimum number of raw points is 10. The weighted points are derived from the following schedule:

<u>Raw Points</u>	<u>Weighted Points</u>
26	100
25	95
24	90
23	85
22	80
21	75
20	70
19	65
18	60
17	55
16	50
15	45
14	40
13	35
12	30
11	25
10	20

- NOTES -

Note 1: Optimum HAAT =  $d \text{ times } d/2$  where HAAT is in feet and  $d$  is the distance in miles to the Operating Area limit. HAAT shall be computed in accordance with Part 90.309(a)(4) of the FCC rules.

Note 2: Optimum ERP will be that ERP which provides an Alpha of 37 dBu for VHF high band or 39 dBu for UHF at the Operating Area limit. ( $\text{Alpha} = 36.6 + 20 \log f + 20 \log d$ ) where  $f$  is the frequency in MHz and  $d$  is the distance in miles.

Note 3: In VHF high band, 37 dBu will be used and in the 450-470 MHz band, 39 dBu will be used for computing the Reliable Service Area. Part 22.504 of the FCC's rules applies.

## **9.0 SYSTEM TECHNICAL DESIGN REQUIREMENTS**

### **9.1 Coverage Limitation - Antenna Height and Power**

System coverage or service area is limited to geographical boundaries in order to maintain maximum frequency reuse within the region. The intent is to restrict the area of radio coverage to the actual jurisdictional boundaries. Agencies requesting new or additional channels will have their proposed system design evaluated by the Arizona Regional Review Committee. Any agency requesting a transmitter location not centrally located within its jurisdiction must include in their request adequate justification for such placement. Transmitter placement and antenna radiation patterns must be chosen to maintain radio system coverage within the jurisdictional boundaries of the entity making the application.

Agencies with service areas outside their political boundaries may request extended system coverage. Such requests for extended coverage must be accompanied by written justification, including an Intergovernmental Agreement covering all involved parties.

Extended coverage systems will not be authorized unless approved by the Arizona Regional Review Committee. Favorable consideration will be given to those extended coverage systems, which are made available for use by eligible entities other than the licensee.

A licensee may apply to utilize one of their authorized base/mobile frequencies as a point-to-point channel pair. This usage must be within the licensee's defined service area, or extended service area, if authorized. Channel loading requirements still apply to a channel used for point-to-point communications.

### **9.2 Definition of Service Area**

Radio System Coverage for "Service Area" is defined as the boundary where predicted signal strength falls to 41 dBu. System parameters must be modified to make sure that the location where the actual service strength falls to 41 dBu is located near the actual service area boundaries, and the signal strength must fall to 40 dBu or below at a point three (3) miles beyond this point.

### **9.3 Calculation of Service Area**

Three factors must be known to determine service area:

(1) the strength of the received signal, i.e., "received signal strength," (2) antenna height above average terrain (HAAT), and (3) the effective radiated power (ERP). Received signal strength has been defined (41dBu), leaving the other two factors that can be modified to achieve the desired coverage. The resulting calculations determine the radius of coverage from the transmitting site. An example of these calculations is shown in the appendix.

It will be permissible for agencies requesting system authorization to determine the distance to the 41 dBu boundary on a radial-by-radial basis with a minimum of eight equally spaced radials at 45 degree intervals, beginning at true North, and plot the service area boundary based on these points. This plot should be submitted with the request for frequencies to show that radio coverage area outside the agencies' political boundary is being kept to a minimum. In any case, a minimum antenna height of 100 feet above ground elevation will be necessary to provide clearance with rooflines and treetops. Any agency with its service area radius of eight (8) miles - regardless of the size of its jurisdiction - providing interference protection for existing co-channel and adjacent channel systems is sufficient.

#### **9.4 Responsibility for Calculations**

It will be the responsibility of the requesting agency to calculate the proposed radio coverage service area and to validate the accuracy of the calculation. It is the requesting agency's responsibility to provide accurate system parameters and determine "Height Above Average Terrain" radials as specified in 90.309(a)(4) of the FCC's Rules and Regulations.

#### **9.5 Proposed Service Area Exhibit**

An agency shall provide, along with its request for frequencies, an exhibit showing the calculated radio coverage service area and the agency's jurisdictional boundaries as well as adjacent city, town, county and state boundaries. The boundaries must be drawn to scale on a 1:250,000 USGS map or suitable scaled computer drawn maps, with a title block including the name of the requesting agency, and the following transmitter information: antenna height, height above average terrain, effective radiated power, latitude, longitude, ground elevation of each transmitting site, and the distance to the service area boundary in miles, as calculated and indicated on the map.

#### **9.6 Control Station (Limit on Effective Radiated Power)**

Control/Base stations shall conform to the radio service area 41 dBu boundary requirement.

#### **9.7 Frequency Reuse**

Careful adherence to the system technical design requirements of this Plan will allow for maximum co-channel usage within this region. Because of the close proximity of adjacent channel frequencies, planning for adjacent channels must be similar to the considerations required for co-channel system design.

An agency requesting frequencies that have been previously licensed within this region or an adjacent region must demonstrate that the proposed system will provide, an "existing to proposed" signal margin of at least 25 dB at the closest point to the service area boundary of the existing system.

As part of this plan, distances between transmitters for co-channel reuse will not be held to seventy- (70) mile separation. Separation of co-channel transmitters will be determined by the coverage needs of the

applicant, natural barriers for separation, antenna patterning and limited ERP's where possible. System tests and/or propagation studies may be provided to establish minimum distances for separation.

### **9.8 Adjacent Channel Design**

Proposed systems must also be designed for minimum interference operation with adjacent channel licensees. The method of determination is identical to that of co-channel design as detailed elsewhere in this Plan, with the exception of the existing to proposed signal margin criteria. In the case of adjacent channel systems, this margin will be reduced to 15 dBu, except that if all adjacent agencies are meeting the narrowband 12.5 kHz emission mask, no adjacent channel protection will be required. All other calculations will remain the same.

It should be noted that the FCC has adopted technical standards for transmitters, which will reduce adjacent channel interference and permit closer geographically adjacent channel use. However, the FCC has not adopted improved receiver technical standards. It is the position of the Commission that receivers do not cause interference, nor do they threaten effective operation of the public safety network, as would substandard transmitters.

Because of the demand for limited spectrum, it is the intent of this Plan to provide efficient spectrum utilization within current technological capabilities. Agencies are encouraged to carefully consider the receiver selectivity specifications of any equipment to be purchased for use in the 821-824/866-869 MHz band. Poorly designed receivers may cause serious degradation of the system in areas using adjacent channels.

### **9.9 Absolute Mileage Separation**

In any case where the radio service areas of adjacent channel systems are separated by at least 70 miles, or co-channel systems separated by 100 miles, the interference studies as set forth in this Plan are unnecessary because of free space and terrain losses.

### **9.10 Trunking Requirements**

As referenced in the "National Plan", trunking is mandated for any new system with more than four channels in the 800 MHz band when located at a single transmitting site. The Arizona Regional Review Committee for mobile data use, encryption, and telemetry stations will consider requests for exceptions. Other requests for waiver of the trunking requirement will be considered after presentation of evidence by the requesting agency. Approval to waive the trunking requirement will be based on the individual merits of the presentation, and will be subject to FCC final approval.

### 9.11 System Loading Requirements

An agency requesting a single frequency to replace a frequency currently in use, that will be turned back for reassignment, will not be required to meet loading requirements in order to obtain the new frequency. However, if the single frequency is not loaded to more than 50 units within three years after the license is granted, the frequency will be available for assignment to other agencies on a shared basis. Shared use of a frequency is not interference free. Users of single frequency systems will be required to provide the ARRC "confirmation of loading" for mobiles and portables as a method of validating system loading. This required updating shall be done annually until minimum loading has been completed.

This exception shall apply to agencies, which have only one system and a single frequency. Agencies requesting additional frequencies or having multiple systems shall comply with the loading standards as outlined in the loading tables or provide a "Traffic Loading Study" that meets the criteria as listed in the loading tables.

#### LOADING TABLES

<u>PUBLIC SAFETY</u>		<u>LOCAL GOVT./OTHER</u>	
Channels	Units/Channel	Channels	Units/Channel
1 - 5	70	1 - 5	80
6 - 10	75	6 - 10	90
11 - 15	80	11 - 15	105
16 - 20	85	16 - 20	120

### 9.12 System Engineering Requirements

All requests to the ARRC for frequencies must include sufficient data for the Committee to be able to determine proposed system operating parameters and shall be considered a system engineering exhibit.

The system-engineering exhibit must show:

1. Transmitter output power.
2. Type of cavities (duplexers, combiners and isolators) their insertion losses and all other associated losses.
3. Type of transmission line and associated loss (including jumpers).

4. Antenna model, gain, downtilt, pattern plots.
5. Ground Elevation above Mean Sea Level.
6. Antenna centerline AGL.
7. Height above average terrain of antenna centerline.
8. Effective Radiated Power as determined by items 1 through 4.
9. Additional "receiver only" locations.
10. CTCSS coding information on both conventional and trunked systems.

### **9.13 Average Elevation Exhibit**

An additional exhibit showing the average elevation of the terrain of each of the eight main radials is required. If an outside source is used for the calculation of average terrain, a copy of this report may be substituted for the average elevation exhibit.

### **9.14 Public Switched Telephone Network (PSTN) Interconnect Use**

The applicant of an 800 MHz trunked radio system may use an interconnect to Public Switched Telephone Network for systems implemented under this Regional Plan. However, the use of cellular telephones (or other telephone interconnect systems) for automatic interconnect to the Public Switched Telephone Network is recommended. Utilization of cellular telephone networks will not impact radio systems implemented under this plan.

### **9.15 Frequency Allocation List**

The frequency allocations contained within this Plan are based on the current and projected needs and system loading through the year 2010. The basis for this frequency allocation listing was taken from a population growth study done by Mountain West Research, completed June 6, 1989. All cities in Arizona with a population above 10,000 in the 1980 Census were extrapolated using county population growth projections for the year 2010. Channel allocation per town is based on one channel per 25,000 population, with a minimum of two channels.(Appendix IV.)

All regional systems being installed by larger entities such as Counties or State are required to allow shared secondary use of the regional system for rural users. All large area systems are encouraged to solicit participation by the rural entities to better facilitate spectrum efficiency, and to provide better communications capability for the rural users. (Refer to Appendix IV for frequency listing.)

**9.16 General Standards**

All authorizations under this plan shall utilize equipment that complies with all applicable technical standards of the Federal Communications Commission.

**10. APPENDICES**

APPENDIX I	Planning Committee Membership
APPENDIX II	ARRC Bylaws
APPENDIX III	NPSPAC Application Procedure
APPENDIX IV	Frequency Allocation List
APPENDIX V	Procedure for Determining Service Area
APPENDIX VI	Adjacent Region Concurrence
APPENDIX VII	Cellular Notifications
APPENDIX VIII	Interagency Radio System Plan

**APPENDIX I - PLANNING COMMITTEE MEMBERSHIP**

**ORIGINAL PLANNING COMMITTEE MEMBERSHIP**

Debbie Overton  
Maricopa County Sheriff's Office  
102 West Madison Street  
Phoenix 85003

Scott Tillman  
AZ. Dept. of Public Safety  
P.O. Box 6638  
Phoenix 85005

Steve Powles  
EMS Coordinator  
State of Arizona  
P.O. Box 6638  
Phoenix 85005-6638

Gail Denny  
Scottsdale PD  
3739 N. Civic Plaza  
Scottsdale 85253

Bill Jordan  
Rural Metro Fire  
4124 N. 33rd Street  
Phoenix 85018

Susan Young  
Sun Health Corporation  
P.O. Box 1690  
Sun City 85372

Carol Quering  
Yavapai College PD  
1100 E. Sheldon Street  
Prescott 86301

David Bennett  
Phoenix PD  
620 W. Washington  
Phoenix 85003

John Stewart  
Snowflake-Taylor PD  
P.O. Box  
Snowflake 85937

Marjorie Burns  
Sierra Vista PD  
2400 E. Tacoma  
Sierra Vista 85635

Abe Castaneda  
Miami PD  
804 Sullivan Street  
Miami 85539

Debbie Woosley  
Wilcox DPS  
151 W. Maley  
Wilcox 85644

Charles Touchstone  
Kearny PD  
P.O. Box 639  
Kearny 85237

Dennis Thompson  
Safford PD  
525 10th Ave.  
Safford 85546

Rod Bosell  
Apache Junction PD  
1001 N. Idaho Road  
Apache Junction 85219

Ed Schnautz  
Tombstone Marshall Dept.  
P.O. Box 339  
Tombstone 85638

Roy Finch  
Cottonwood PD.  
816 N. Main  
Cottonwood 86326

Manuel Cabera  
Arizona Western College PD  
P.O. Box 929  
Yuma 85364

Arlieth Richmond  
Navajo Co. Sheriff's Office  
P.O. Box 668  
Holbrook 86025

Carol Capas  
Huachuca City PD  
500 N. Gonzales  
Huachuca City 85616

Darrel Jenkins  
Springerville PD  
P.O. Box 390  
Springerville 85938

Anna Serrano  
Superior PD  
734 Main Street  
Superior 85273

T.J. Horrall  
Florence PD  
P.O. Box 988  
Florence 85232

Ken Murphy  
LR Pyle Memorial Hospital  
807 S. Ponderosa  
Payson 85541

Shannon Pendleton  
Rural Metro Fire  
4151 W. El Camino Del Cerro  
Tucson 85741

Larry Gale  
Greenlee Co. Sheriff Off.  
P.O. Box 998 - Hwy 666  
Clifton 85533

Velma Washington  
Buckeye PD  
P.O. 537  
Buckeye 85326

Zetta Hall  
Eager PD  
P.O. Box 1300  
Eagar 85925

Debbie Kosmata  
Yuma PD  
1500 1st Ave.  
Yuma 85364

Clem Rogers  
Tohono O'Odham PD  
P.O. Box 188  
Sells 85634

Pat Spence  
Clarkdale PD  
P.O. Box 308  
Clarkdale 86324

Eileen Halpin  
Tucson Medical Center  
5301 E. Grant  
Tucson 85712

Mike Sipes  
Patagonia State Park  
P.O. Box 1150  
Nogales 85628

Virginia Howard  
Marana Volunteer FD  
13470B N. Sandario  
Marana 85653

James Eidson  
Lake Havasu City PD  
296 London Bridge Rd.  
Lake Havasu City 86403

Ernie Encinas  
Tolleson FD  
9169 W. Monroe  
Tolleson 85353

Leon D. Dame  
Tucson Estates FD  
3195 S. Kinney Rd.  
Tucson 85713

James Broome  
Rincon Valley Fire Dist.  
P.O. Box 279  
Vail 85641

Rich Tannehill  
AZ. Dept. of Public Safety  
P.O. Box 6638  
Phoenix 85005

Dan Wills  
Sedona Fire Dept.  
2860 Southwest Dr.  
Sedona 86336-3728

Herb LeGendre  
Phoenix Fire Dept.  
620 W. Washington St.  
Phoenix 85003-5008

Sam Bass  
APCO FAC  
1361 S. Edlin Ave.  
Tucson 85711-6033

Ron Barwick  
Maricopa County Telecomm.  
3325 W. Durango St.  
Phoenix 85009-6214

Lois Engstrand  
U.S. Marshall  
P.O. Box 791  
Tucson 85702

Jack Young  
Gilbert PD  
459 N. Gilbert Rd.  
Gilbert 85234

John Fairchild  
Flagstaff PD  
120 N. Beaver St.  
Flagstaff 86001

Jim Luce  
Cochise Co. Sheriff's Office  
P.O. Drawer F  
Bisbee 85603

Gary Dull  
Chandler PD  
250 E. Commonwealth  
Chandler 85225

John Mangogian  
US Marshall Service  
230 N. 1st Ave Room 8204  
Phoenix 85025

Henry Zappia  
U of A Telecomm.  
CCIT Bldg 73 Rm 218  
Tucson 85721

Hal Collett  
La Paz Co. Sheriff's Office  
1015 Arizona Ave.  
Parker 85344

Arlan Berg  
Kingman PD  
310 N. 4th St.  
Kingman 86401

Onno Prinze  
Paradise Valley PD  
6401 E. Lincoln  
Paradise Valley 85253

Kevin Corso  
Gila Co. Sheriff's Office  
P.O. Box 311  
Globe 85502

Robert Erickson  
City of Phoenix Aviation  
3400 Sky Harbor Road  
Phoenix 85034

Duncan Mac Phail  
Sun Lakes FD  
25455 Sun Lakes Blvd.  
Sun Lakes 85248

Eric Duthie  
Sunnyside FD  
1255 21st  
Douglas 85607

Brent Ackzen  
Glendale PD  
7119 N. 57th Dr.  
Glendale 85301

Don Parks  
Gilbert PD  
459 N. Gilbert  
Gilbert 85234

Kathleen Brennan  
Pima Co. Sheriff's Office  
P.O. Box 910  
Tucson 85711

Norm Hicks  
Grand Canyon Airport  
P.O. Box 3188  
Grand Canyon 86023

George Lawton  
Pima College PD  
2202 W. Anklam  
Tucson 85709

John Amidon  
ADOT  
206 S. 17th Ave.  
Phoenix 85007

Hank Potosky  
US Secret Service  
230 N. 1st Ave. Rm 2041  
Phoenix 85025

John Harris  
Puerco Valley Emerg. Svc.  
P.O. Box 39  
Sanders 86512

Dave Petrushka  
Chandler FD  
98 W. Chicago  
Chandler 85224

Bob Gates  
Salt River Project  
P.O. Box 52025  
Phoenix 85072-2025

Viola Mullins  
Peoria PD  
8355 W. Peoria  
Peoria 85345

Ernie Levario  
Kords Ambulance Service  
P.O. Box 41866  
Tucson 85717

Roger Snapp  
El Dorado Hospital  
1400 N. Wilmot  
Tucson 85712

Joseph Mortimer  
Cyprus Bagdad Copper Corp.  
P.O. Box 245  
Bagdad 86321

Gilbert Balcome  
Surprise FD & PD  
12604 Santa Fe  
Surprise 85374

Bob Frey  
City of Tempe  
P.O. Box 5002  
Tempe 85280-5002

Dep. Chief Curtis  
Central Yavapai Fire Dist  
8555 E. Yavapai Rd.  
Prescott Valley 86314

Taylor Satala  
Indian Health Service  
P.O. Box 198  
Peach Springs 86434

Karl Hartmetz  
Buckskin FD  
Rt. 2 Box 721  
Parker 85344

Bob Ford  
Entech Elec. Svcs.  
4401 S. 36th St.  
Phoenix 85040-2901

Gary Schmidt  
Baptist Hospitals  
6025 N. 20th Ave.  
Phoenix 85015

Joseph E. Paulus  
City of Cottonwood  
827 N. Main  
Cottonwood 86326

Jon D. Colvin  
Chinle Community FD  
P.O. Box 825  
Chinle, Navajo Nation

Peter Meeks  
City of Phoenix Comm.  
2441 S. 22nd Ave.  
Phoenix 85009-6917

Tony Tricoci  
City of Mesa Comm.  
P.O. Box 1466  
Mesa 86211-1466

Mike Zakrajsek  
City of Phoenix Computer Svcs.  
620 W. Washington St.  
Phoenix 85007

Don Pfohl  
City of Mesa Comm.  
P.O. Box 1466  
Mesa 85211-1466

Werner Wolff  
Oro Valley PD  
680 W. Calle Concordia  
Oro Valley 85737

Rose Johnson  
South Tucson DPS  
P.O. Box 7307  
Tucson 85725

Ralph Clair  
Youngtown Public Safety  
12038 Clubhouse Square  
Youngtown 85363

Jose Solarez  
Town of Guadalupe  
9050 S. Avenida del Yaqui  
Guadalupe 85283

Bud Avery  
Yuma PD  
1500 1st Ave.  
Yuma 85364

Jake Bender  
Yavapai Co. Sheriff's Office  
255 E. Gurly  
Prescott 86301

Pat Harvey  
Fountain Hills Road District  
16941 E. Pepperwood Circle  
Fountain Hills 85268

Karl Hartmetz  
Buckskin FD  
Rt. 2 Box 721  
Parker 85344

Jim O'Melia  
Motorola C & E  
2737 W. Baseline Suite 22  
Tempe 85283

John Atlee  
US DEA  
3150 Windsor Suite 202  
Yuma 85365

Max Grigg  
General Electric  
3020 E. Camelback Suite 365  
Phoenix 85016

Victor Ortiz  
Santa Cruz Sheriff's Office  
P.O. Box 1150  
Nogales 85621

Lee Roberts  
AT & SF Railway Police  
P.O. Box 4247  
Phoenix 85030

Skip Luttrell  
Surprise PD  
12604 Santa Fe  
Surprise 85374

Judy Robertson  
Mesa General Hospital  
515 N. Mesa Dr.  
Mesa 85201

Roy Heatherly  
Mesa Lutheran hospital  
525 W. Brown  
Mesa 85201

Mark Kishbaugh  
Picture Rocks FD  
6625 N. Sandario Rd.  
Tucson 85743

Robert Schmidt  
Apache Junction FD  
3955 E. Superstition  
Apache Junction 85219

Leon D. Dame  
Tucson Estates FD  
3195 S. Kinney Rd.  
Tucson 85713

Eddie Jenkins  
San Luis DPS  
P.O. Box 3740  
San Luis 85349

Audrey Martin  
Tri Valley Ambulance  
35810 Antelope Dr.  
Welton 85356

**APENDIX II - ARRC BYLAWS**