

TO: Pima County Wireless Integrated Network (PCWIN) Participants

Subject: PCWIN Ranking of Voice and Data Attributes

DATE April 13, 2006

We are now ready to begin the Ranking of Attributes process that will assist CTA in determining, from the users perspective, what elements of a Radio and Data System you believe are the most essential for your day to day operations as well as in times of emergency.

On the second Tab of this Worksheet you will find a listing of Attributes. These Attributes are characteristics of a Voice and Data System that will address the problems as either observed or identified to us, We are focusing on resolving problems and needs identified during our interviews, site surveys, and operational surveys. Feel free to include comments on listed attributes or important factors you believe require additional consideration.

On the third Tab of this Worksheet you will find a detailed description of each Attribute for your review and understanding. Please take a moment to review these descriptions to ensure you fully understand how each Attribute will affect your operations and mission.

We will compile the results from each responding participating agency and use the results to provide weighting factors for the ranking of the system design alternatives we will consider. We will then merge our assessment of the alternative system solutions with the weighting of the attributes, resulting in a numerical ranking of the system alternatives.

Our PCWIN project is a fast paced project and accordingly we ask that you return these Attributes Rankings as quickly as possible and not later than 19 April 2006. We thank you very much for your continued active participation in PCWIN, it is this participation that will ensure the success of PCWIN.

Before providing your responses to this ranking form, please perform a "Save As" and rename the document by adding your agency name to the end.

Sincerely,
CTA Communications, Inc.

Cheryl S. Siggett

Cheryl S. Giggetts, PMP
President
CTA Project Manager

cc: Captain Paul Wilson (Pima County Sheriff's Department)
Ken Ballard, Ph.D. (CTA)
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Organization /
Agency Name: _____

Contact Name: _____

Date: _____

VOICE AND DATA ATTRIBUTES RANKINGS

Ranking Scale:

- 0 - Attribute is NOT IMPORTANT to the user.
- 1 - Attribute is MINIMALLY IMPORTANT to the user.
- 2 - Attribute is NICE TO HAVE, could enhance operations.
- 3 - Attribute is USEFUL, will promote more efficient day to day operation.
- 4 - QUITE IMPORTANT, lack could result in degradation of mission, injury, or loss of property.
- 5 - CRITICAL, lack generally will result in injury, loss of property, or degradation of mission.

	ATTRIBUTE	RANK (0 - 5)	COMMENTS
Radio Coverage			
1	Improved Voice Radio Coverage – Eastern County		
2	Improved Voice Radio Coverage – Central County		
3	Improved Voice Radio Coverage – Western County		
4	In-building Coverage		
5	Minimize Local Interference		
Voice Radio Operations			
6	Increased Channel Capacity		
7	On-scene Fire Channels		
8	Monitored Firegrounds		
9	Emergency Alerting		
10	Workgroup Oriented Operation		
11	Voice Security		
12	Operational Boundary Transparency		
13	One System Serves All Agencies		
14	Interoperability through Dispatch		
15	Interoperability with Adjacent Counties		
16	Interoperability with State Agencies		
17	Interoperability with Federal Agencies		
18	Person Location		
19	System Control		
20	Recorded Operations		
21	Simplified User Operations		
Dispatch Operations			
22	Increased Dispatch Channel Capacity		
23	Dispatch Capacity		
24	Dispatch Coverage		
Mobile Data Functions			
25	One Mobile Data Network Serves All Agencies		
26	Cross CAD Interconnection		
27	Mobile Data Criticality		
28	Vehicle Location		
29	EMS Telemetry		
30	High-Speed Broadband Service		
31	Mobile Applications		
32	Advanced Mobile Applications		
33	Access County Information		
Paging and Alerting Operations			
34	Private Personnel Paging		
35	Fire Station Alerting		
36	Paging over Cellular		
Infrastructure Capabilities			
37	Future Expansion		
38	Owner-Controlled Backbone		

Organization /
Agency Name: _____

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	ATTRIBUTE	RANK (0 - 5)	COMMENTS
39	Microwave Connectivity		
40	Microwave Additional Capacity		
41	Regional Connectivity		
Reliability and Availability			
42	Survivability		
43	Reliability/Failure Hierarchy		
44	Single Points of Failure		
45	Power Backup		
Training and Maintenance			
46	Staffing and Training		
47	Centralized Maintenance		
Cost and Procurement			
48	Competitive Procurement Process		
49	Commonality of Equipment		
50	Multiple Sources		
51	Phased Implementation		
52	Tiered Subscriber Cost		

System Attribute Descriptions:

System attributes are characteristics that COULD be emphasized in the new system design.

Radio Coverage

- 1 Improved Voice Radio Coverage – Eastern County
The voice radio system shall provide coverage over the majority of the eastern half of the County including metropolitan Tucson. Coverage will be designed with areas for portable coverage, in-building portable coverage where appropriate, and street level coverage for mobiles. The coverage area will include specific areas outside the County where service is required. Coverage should be evenly distributed over the service area.
- 2 Improved Voice Radio Coverage – Central County

The voice radio system shall provide as much coverage as possible in areas within the central area of the County. The coverage design will maximize the coverage that can be obtained from the available tower sites.
- 3 Improved Voice Radio Coverage – Western County

The voice radio system shall provide coverage over the majority of the populace and highway areas of the western areas of the County. Coverage will be designed with areas for portable coverage and street level coverage for mobiles. Coverage should be evenly distributed over the service area.
- 4 In-building Coverage

The radio system shall be designed to provide in-building coverage in the metropolitan Tucson area and in other areas where appropriate. In-building coverage will be provided first by increasing coverage in areas of light, medium, and heavy buildings, and then through the application of in-building coverage systems in targeted buildings.
- 5 Minimize Local Interference

The system shall eliminate inter-site (co-channel), and local bleed-over interference.

Voice Radio Operations

- 6 Increased Channel Capacity

The system design shall include additional channels for current and future capacity. Additional channels are important are to alleviate congestion on the dispatch and incident channels.
- 7 On-scene Fireground/Tactical Communications Channels

The system design shall include licensed simplex frequencies for use by fire departments or law enforcement units on-scene. Direct radio-to-radio frequencies enable local incident communications in-building, below grade, and in other situations where repeated channels do not offer solid coverage.
- 8 Monitored Firegrounds

The system design shall provide a means of routing direct radio-to-radio fireground channels to dispatch. Fireground communications must be available to be monitored by dispatch, command personnel, or recording.

System Attribute Descriptions:

System attributes are characteristics that COULD be emphasized in the new system design.

- 9 Emergency Alerting
The radios and system shall provide an emergency function for alerting dispatch and supervisors to the need for assistance.
- 10 Workgroup Oriented Operation
The system shall be organized with sufficient channels or talk groups to allow departmental workgroups to have their own channel or talk group.
- 11 Voice Security
The system shall provide encrypted communications for users that need to prevent unauthorized interception of sensitive information.
- 12 Operational Boundary Transparency
The radio system design shall utilize multiple tower sites, and to the extent possible, automatically switch to the correct site, transparent to the radio user. System operation will be logical, with the focus on who the user wants to call rather than where they are located.
- 13 One System Serves All Agencies
One radio system shall support all Public Safety agencies in Pima County including all Fire agencies and all Police and Emergency Service agencies. Convenient, same-radio communications is important between all Public Safety agencies within the County.
- 14 Interoperability through Dispatch
The radio system shall provide a connection between all dispatch operations allowing dispatchers to facilitate information flow between agencies through dispatch and incident command, rather than at the user level.
- 15 Interoperability with Adjacent Counties
The radio system design shall emphasize compatibility with radio systems in the adjacent counties to enable public safety users to assist in adjacent counties (and visa versa) and communicate with users from other Public Safety agencies using their assigned radios.
- 16 Interoperability with State Agencies
The radio system design shall emphasize compatibility with radio systems in use by the State of Arizona. This will facilitate communications between State agencies and agencies within Pima County.
- 17 Interoperability with Federal Agencies
The radio system design shall emphasize compatibility with radio systems in use by the Federal agencies operating in Pima County. While local agencies cannot operate radio on Federal channels, compatible equipment would facilitate Federal/local cooperative efforts if Federal users could communicate over County infrastructure.

System Attribute Descriptions:

System attributes are characteristics that COULD be emphasized in the new system design.

- 18 Person Location
The radio system shall include radio location technology to map the location of user radios. Dispatch can determine the location of a user (to his portable or mobile radio), useful for example when sending assistance.
- 19 System Control
Agency is significantly more comfortable with the high level of system control that comes with exclusive use and system ownership.
- 20 Recorded Operations
The system design shall provide the capability of recording audio for all Public Safety agencies using the system. Logged audio is important for all dispatch and incident communications.
- 21 Simplified User Operations
The user radios shall offer advanced functionality but emphasize simple user operation. It is important for user radios to be easy to use and operate, require little attention, resist accidental setting changes, interface to advanced accessories (including wireless), exhibit good battery life, and be of rugged design.

Dispatch Operations

- 22 Increased Dispatch Channel Capacity
The system shall provide for sufficient channels for dispatch operations
- 23 Dispatch Capacity
The dispatch system shall provide sufficient consoles and dispatcher positions so that a dispatcher can be contacted whenever one is needed.
- 24 Dispatch Coverage
Users can contact dispatchers via radio from anywhere in the operational area.

Mobile Data Functions

- 25 One Mobile Data Network Serves All Agencies
One mobile data network shall support all Public Safety agencies in Pima County including all Fire agencies and all Police and Emergency Service agencies. A common network is important for compatibility and to avoid duplication of equipment, operation, and maintenance.
- 26 Cross CAD Interconnection
The system design shall include a means of exchanging information across the three major CAD systems used in the County: Spillman, ADSI, and PRC. CAD information exchange is important for information database sharing.

System Attribute Descriptions:

System attributes are characteristics that COULD be emphasized in the new system design.

- 27 Mobile Data Criticality
The mobile data network is equally important to public safety communication as the voice radio system. The mobile data network will be designed to meet the same critical communications standards as the voice radio system.
- 28 Vehicle Location
Automatic vehicle location (AVL) shall allow vehicles to be located by users in other vehicles and by dispatch. Unit location information can assist dispatch in selecting units for incident response and by incident commanders for checking location status of assigned units.
- 29 EMS Telemetry
The mobile data radio network shall support telemetry of EMS patient data. This function is needed in the vehicle while en route and patient-side in the field.
- 30 High-Speed Broadband Service
The system design shall include locations with access to wireless broadband service. High bandwidth service is important for advanced surveillance applications, exchange of bulky files, access to bandwidth intensive County/City information, and laptop maintenance.
- 31 Mobile Applications
The mobile data system shall be designed around an application set suitable for routine law enforcement and fire operations. These capabilities typically include:
- CAD dispatch
 - Records access
- The mobile data system shall be designed around an application set suitable for routine law enforcement and fire operations. These capabilities typically include:
- Unit status
 - Sheriff civil process
 - In-car mapping
 - Automatic Vehicle location
 - Messaging
 - Email
 - State and National Queries
 - Access to electronically stored reference materials
 - Other law, fire, public service specific applications
- 32 Advanced Mobile Applications
The mobile data system shall include capacity and capability for advanced applications for law enforcement and fire operations. Advanced capabilities include:
- Video Surveillance
 - Field biometrics
 - Mobile access to many types of County information
 - Larger photos
 - Field citations
 - Field reports
- 33 Access County Information
The mobile data radio network shall provide access to County GIS (AIMS) information. Transfer of this type information tends to require significant bandwidth and may be offered over wireless broadband or be provided as local MDC files.

System Attribute Descriptions:

System attributes are characteristics that COULD be emphasized in the new system design.

Paging and Alerting Operations

34 Private Personnel Paging

The radio infrastructure shall include a private paging system and pagers for alerting individuals and groups of users in any agency. Private paging helps assure rapid and reliable paging using dedicated equipment with guaranteed capacity.

35 Fire Station Alerting

The radio infrastructure shall include equipment for alerting individual fire stations.

36 Paging over Cellular

The paging system shall include a means of delivering pages over secondary path through commercial wireless service to cellular phones or PDA devices. This capability provides a backup paging service and also out-of-town paging.

Infrastructure Capabilities

37 Future Expansion

The system shall be capable of future expansion in the number of channels and the number of users. System design shall incorporate expansion to the level of usage predicted for the next 10 years with only the addition of equipment.

38 Owner-Controlled Backbone

The system shall be interconnected using a dedicated interconnecting backbone network. The goal is to maximize reliability, minimize use of leased carriers and associated costs, and maintain control of the network.

39 Microwave Connectivity

The system design shall include a microwave network to carry radio and mobile data traffic. The goal is to have a dedicated, highly reliable network interconnecting all major radio locations.

40 Microwave Additional Capacity

The network design shall include extra capacity, over and above the radio and mobile data needs, for other County uses. The County intends to add the microwave network into the overall County network for transport of various types of information.

41 Regional Connectivity

The system design shall provide infrastructure connectivity to adjacent areas. For example, PCWIN may be connected, either directly through the infrastructure, or through a gateway, to the Phoenix/ Mesa system, adjacent County systems, or State infrastructure.

System Attribute Descriptions:

System attributes are characteristics that COULD be emphasized in the new system design.

Reliability and Availability

42 Survivability

The system shall be designed to survive in severe weather or emergency conditions. If dispatch points are shifted from their primary to a backup location, radio control shall be available at the backup location to the same degree it was available at primary dispatch.

43 Reliability/Failure Hierarchy

The radio system and equipment must be designed such that single-mode failures do not perceptibly impact the routine operations of the system.

The following requirements shall apply to failure conditions:

- Channel failure: no operating impact due to failed voice channel.
- Site failure: no operating impact except reduced coverage area.

Primary power failure: UPS backup shall be supplied for all computer/control equipment, and generator backup for the radio equipment.

Console failures: Single console failure: use reserve console. Console common equipment failure, dispatchers operate co-located radio control station. Communications Center failure: Dispatch using radio control stations at a backup dispatch center.

44 Single Points of Failure

The system shall, as much as practical, minimize single points of failure. This is accomplished through redundant equipment, multiple paths, backup equipment, etc.

45 Power Backup

All fixed radio equipment shall require backup power with automatic transfer, capable of handling 100 percent loading of radio equipment. An uninterruptible power system (UPS) shall be required for computer control equipment.

Training and Maintenance

46 Staffing and Training

The system vendor shall provide formal training for system administrators, supervisors, dispatchers, radio users, and maintenance technicians.

47 Centralized Maintenance

The County prefers to centrally maintain and administer the radio system, dispatch systems, and user radios, either in-house or using a service shop. Centralized maintenance provides consistent and coordinated services for all user departments.

System Attribute Descriptions:

System attributes are characteristics that COULD be emphasized in the new system design.

Cost and Procurement

48 Competitive Procurement Process

The overall system concept shall be available from more than one vendor allowing a competitive procurement process. Equipment shall be procured using open non-restrictive, competitive specifications. Award to be based on the most cost-effective system meeting the regions operational and functional requirements.

49 Commonality of Equipment

A single vendor shall install and supply all required equipment. As much as possible, user equipment shall be similar in operation and maintenance requirements. The goal is to minimize spare parts inventory and multiple vendor training requirements.

50 Multiple Sources

Compatible user equipment shall be available from multiple vendors. Competitive procurement of user equipment is more important than equipment commonality.

51 Phased Implementation

As much as possible, system procurement and implementation shall occur on a phased basis, allowing costs to be spread over several years. The radio system shall be designed to add user groups to the system over time.

52 Tiered Subscriber Cost

High-, mid-, and low-tier radio equipment with feature sets and costs matched to the user group shall be provided. The initial cost of user radios is a prime concern in the evaluation of proposed alternatives.