Volunteer Communications Plan

City of Beaverton, Emergency Management Program, Communications Group

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Revision 1.0

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Revision History

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1.0 Purpose

This document describes how the City of Beaverton (City) and its volunteers will coordinate and utilize available communication resources to support volunteer efforts in a range of situations including training, planned events, unplanned incident responses and disasters.

This document plans for volunteer support in place today, recognized limitations and recommendations for future improvement.

2.0 Situation and Assumptions

2.1 Situation

Effective communications capability is essential to all organizations to facilitate and support emergency operations. The ability to effectively communicate largely dictates the speed and effectiveness of handling the emergency.

At the present time the effective volunteer force for the City consists of

1) Trained Community Emergency Response Teams (CERT)
2) The Beaverton Communications Group (BCG) supporting communications internal to the City and to served agencies throughout Washington County.

In the future, this may expand to Map Your Neighborhood (MYN) teams, Neighborhood Amateur Radio Operators (AROs) and Faith-based and Fraternal Community Organizations.

Formal communication between volunteers is primarily by email. Contact information of volunteer leadership, including email addresses and voice/ text phone numbers are made available to volunteer members and can be used, in that order, at any time. Phone/text information for volunteers is not published and will not be used routinely to contact volunteers. When available, these methods will continue to be utilized, as applicable, for communication during all scenarios.

The City volunteers participate in four types of situations, or scenarios, each of which has different communications requirements:

- *Planned Exercises, Drills and Training* - Volunteer teams and sub-teams will routinely schedule meetings for verbal information exchange. For field exercises, teams may use Family Radio Service (FRS) and Amateur UHF/VHF radios for remote communication as determined by their Communication operations plan and EAPs. For City-wide events teams will use Public Safety Radios for ease and consistency of communication. By their nature, Communication Group events will involve both Amateur and Public Safety radios.

- *Planned events (*City and Community Service*)* – Volunteer teams will use Public Safety radios for ease and consistency of communication.

- *Incidents* – (Unplanned events where the City requests volunteer assistance, e.g. incident crowd management, Walkaways) Radio communication will use Public Safety radios. Volunteers will be notified of deployment information and instructions via automated texting to mobile phone. FRS and Amateur radio may be used for sub-team communications, if needed.

- *Disasters – (*Where most/all of the City is impacted by a major regional incident(s)) Sub-teams will use FRS and/or Amateur Radio per their team plan. Inter-team and command central communication will be by Ham or, as available, Public Safety radio. Communication Group volunteers support secondary communication to local agencies, Washington County, State and Federal agencies. Distant communications for welfare checks are also supported.

2.2 Resources

The City Emergency Management Program maintains communications resources to support the above scenarios as follows: [NOTE: The Public Safety Future planning information will be removed from this document when the City Communication Plan is approved.]

2.2.1 Public Safety Bands Equipment

- VHF Handheld Transceivers, Quantity 50. Used primarily for volunteer events, training and incidents. A common resource during disasters, some of this resource may be available for volunteer communication. Includes a store of spare antennas and batteries. There are surplus speaker microphones. (See 9.0 Considerations)
- UHF Handheld Transceivers, Quantity 10. Used primarily for volunteer events, training and limited response incidents. They are used with the Radio Audio Bridge in local areas where the VHF signal is weak. A common resource during disasters, some of this resource may be available for volunteer communication. Includes a store of spare antennas and batteries.
- VHF Mobile Transceiver Go Box, Quantity 2. Used primarily as a field command radio for volunteer events, training and limited response incidents. A common resource during disasters, some of this resource may be available for volunteer communication. Includes pouches with a gain antenna, cable, mast and tripod. Planned external battery support. Planned future P.25 upgrade. (See 9.0 Considerations)
- VHF/UHF Mobile Transceiver pair, Quantity 1. Used primarily with the Radio Audio Bridge. Can function as standalone UHF and VHF mobile transceivers. Planned upgrade for field battery operation. (See 9.0 Considerations)
- VHF Base Transceiver, Quantity 1. Used primarily as a command station for EOC operation. It is also available as an office volunteer command radio. The radio is operated remotely over Ethernet using application software on a personal computer. Planned upgrade for low noise and P.25 operation. (See 9.0 Considerations)
- UHF Base Transceiver, Quantity 1. Used primarily as a command station for EOC operation. It is also available as an office volunteer command radio. The radio is operated remotely over Ethernet using application software on a personal computer. Planned upgrade for low noise and P.25 operation. (See 9.0 Considerations)
- VHF Repeater, Quantity 1. Used primarily supporting volunteer events, training and limited response incidents. A common resource during disasters, some of this resource may be available for volunteer communication. Includes battery backup. Potential upgrade to P.25 operation. Potential frequency pair change. Potential relocation. (See 9.0 Considerations)
- Dual UHF/VHF Mobile Transceiver Assembly, Quantity 1. A higher power resource for use with the Radio Audio Bridge. Planned battery capability. (See 9.0 Considerations)
- Future VHF Repeater, Quantity 1. A supplement or replacement for the existing VHF Repeater utilizing an allocated frequency pair. P.25 capability. (See 9.0 Considerations)
- Future UHF Repeater, Quantity 1. Supporting Public Works daily operations and disaster operations for Beaverton Police. P.25 capability. (See 9.0 Considerations)

- Radio Audio Bridge Go Box, Quantity 1. Links two radios together for audio and PTT functions to link two radio channels together. Used primarily supporting volunteer events, training and limited response incidents where the VHF signal is weak. A common resource during disasters, this resource may be available for volunteer communication. Planned support for additional radio pairs. Planned acquisition of a second unit for backup and large events. (See 9.0 Considerations)

2.2.2 Amateur Radio Bands Equipment

- Dual Band 2m/70cm Mobile Transceiver Go Box, Quantity 3. Used for disaster volunteer field operations. 1) Cross-band repeater for weak UHF signal from field teams. 2) Communication with a multi-team field staging area. 3) Secondary communication with a Beaverton Operating Base (BOB). Includes pouches with dual band gain antenna, cable, mast and tripod. Planned external battery capability. (See 9.0 Considerations)
- Dual Band 2m/70cm Mobile Transceiver with Digital Capability Go Box, Quantity 2. Primarily used to support Beaverton Operations Bases (BOB) in disasters. Includes pouches with dual band gain antenna, cable, mast and tripod. Planned external battery capability and adding computer. (See 9.0 Considerations)
- 70cm Repeater, Quantity 1. 1) Support volunteer communication training, 2) During disasters serves as the primary radio link to CERT command at the EOC and is the primary method of communication between CERT field teams. Includes battery backup.
- Dual Band 2m/70cm Base Transceiver with Digital Capability, Quantity 3. BCG communication to served agencies from the primary and secondary EOC sites. Planned upgrade of digital capability and additional computer support. (See 9.0 Considerations)
- Multiple Band HF/VHF Base Transceiver with Digital Capability, Quantity 2. BCG communication to local served agencies, State of Oregon and Federal staging facilities. Planned upgrade of digital capability and additional computer support. Planned transition from Community Center to Public Safety Center (PSC). (See 9.0 Considerations)
- Multiple Band Field Station, Quantity 1 – For field support communicating with served agencies. Includes 2m, 70cm and HF bands support. Need upgrade for HF antenna tuning and Winlink support across all bands. (See 9.0 Considerations)
- Dual Band 2m/70cm Handheld Transceiver, Quantity 6. Primarily used for coverage testing and volunteer training. Included with each deployed Mobile set for testing.

2.2.3 AM Band Transmitter

The City Emergency Management Program maintains a 10 Watt transmitter for broadcasting information and instructions to the public. Instructions to volunteers may also use this media.

2.2.4 Mass Notification System

The City Emergency Management Program utilizes a commercial, web-based, mass notification application to send cellular phone text messages and email messages to volunteers for notifications, informational messages and activation/deactivation information during incidents.

2.2.5 Volunteer Database/Email System

The City Emergency Management Program maintains a confidential database and email messaging system including volunteer status, contact, training and participation information. The associated email messaging system supports distributed routine and incident information to volunteers..

2.3 Assumptions

In most cases, sufficient local communications resources will be available to meet the needs of an event or incident. However, a situation could arise in which one or more channels of communication are overloaded, damaged, or destroyed. In these instances, alternative channels of communication are available to supplement or replace the primary system. Situations that can result in the need to use auxiliary resources and channels include:

- Telephone system overload – Disasters typically generate a spike in cellular and landline phone traffic that can result in busy signals and render those systems useless to most users.
- Radio Channel Overload – The extent of an incident involving many volunteers and resulting radio traffic can be expected to overload the primary volunteer radio channels.
- Radio or telephone damage – Any number of natural or human caused hazards can damage, destroy, or otherwise render unusable one or all the systems.

In disaster, the availability of volunteers for base and field assignments for multiple shifts will be limited. This will require establishing personnel priorities supporting radio communication.

The City provides equipment and space supporting the base/command operations and fixed field equipment (e.g. repeaters, bridges) for all situations. In disasters volunteers are expected to provide their own personal communications equipment, augmented by City resources as the disaster allows.

3.0 Concept of Operations

3.1 Definitions

See Appendix E, Definitions of Commonly Used Terms

3.2 General

Effective incident management relies on flexible communications systems that provide accurate, timely and relevant information. During an incident, this system maintains communications connectivity and situational awareness.

Four key communications and information systems principles support the ability of incident managers to maintain a constant flow of information during an incident.

1. Interoperability
2. Reliability, Scalability and Portability
3. Resilience and Redundancy
4. Security

3.2.1 Interoperability

Interoperability is the capacity for emergency management and response personnel to interact and work well together. Interoperable communications systems enable personnel and organizations to communicate 1) within and across jurisdictions and organizations, 2) via voice, data, and video systems, and 3) in real time.

3.2.2 Reliability, Scalability and Portability

Communications and information systems should be designed to be 1) **Reliable** by being familiar to users, adaptable to new technology and dependable in any situation, 2) **Portable** to effectively be transported, deployed and integrated to enable support of incidents across jurisdictions, and 3) **Scalable** from small to large scale , able to expand to support situations, and support the rapid increase in the number of system users.

3.2.3 Resiliency and Redundancy

Resilient and redundant communications ensure the uninterrupted flow of information. **Resilient** systems can withstand and continue to perform after damage or loss of infrastructure. **Redundant** so that, when primary communications methods fail, duplicate systems enable continuity through alternate communications methods.

3.2.4 Security

Because some incident information is sensitive, voice data networks and systems should be secure to the appropriate level to control access to sensitive or restricted information.

Volunteer radio and email systems are NOT secure and must not be used for sensitive, personally identifiable or classified information.

Incident communications and information sharing should comply with data protection and privacy laws.

3.3 Volunteer Communications

Communications to volunteer members will follow the privacy policies established by the City for volunteer communication.

Volunteer teams will follow this communication plan in terms of mode of operation, equipment and allocated channels unless superseded by the current Event Action Plan (EAP) or Incident Action Plan (IAP).

Communication will be predicated on the size and complexity of the incident, the condition of supporting infrastructure, the amount of communications traffic needed to support the response, and the availability of additional resources to meet the need.

As much of the communications planning process as possible will be completed prior to any disaster or emergency and will be maintained as part of the EOC procedures. Any changes, modifications, or additions to the Communications Plan that are made for a specific incident will be documented in the Incident Action Plan.

A 24-hour format clock will be used for all radio traffic.

3.4 Assessing Impacts to Communications Systems

Following the ICS system the Communications Unit Leader (COML), or designee, will continually work with Incident Command, City Emergency Management Program and CERT Group leader to assess the prioritized volunteer communication requirements and the allocation of available equipment and personnel to best meet those requirements.

3.5 Volunteer Communication Modes

Scenario 1 –Exercises, Drills and Training

For field exercises volunteer teams will use FRS and Amateur band radios for remote communication as determined by their communication plan and the EAP.

City-wide exercises will use Public Safety Radios for ease and consistency of communication. (See Appendix B – Beaverton CERT Event Communications) Most events will utilize the Beaverton Emergency Management Repeater (Channel 1) to connect directly from Command to the teams. For the case of events over a small geography or multiple events, Beaverton Channel 5 may be used as the command channel. For extended team to team communications or status messages, a Tactical channel of Channels 4 or 5 will be used.

In some situations, physical obstructions preclude direct communications on a VHF channel. An example is teams deployed both inside and outside of a building where the VHF frequencies do not penetrate well. In these situations, a Radio Bridge will be used to link the VHF command channel to simplex Interop channels UTAC42 or UTAC43. Personnel in the affected area will use UHF handheld transceivers to communicate through the bridge.

Communications Group exercises, by their nature, will utilize Public Safety radios and Amateur band equipment and channels as specified in the EAP.

Scenario 2 – Planned Events – Volunteer teams will use Public Safety Radios for ease and consistency of communication. This scenario will use the same volunteer communication methods as scenario 1. Volunteer command will maintain communication with the event coordinators and Beaverton Police, as appropriate, through alternate communication channels.

Scenario 3 – Incidents - Unplanned events where the City requests volunteer assistance

Volunteer teams will use Public Safety Radios. Volunteers will be notified of deployment information and instructions via automated texting to mobile phone.

This scenario will us the same communication methods as scenario 2. FRS and Amateur radio may be used for sub-team communications, if needed.

Scenario 4 –Disasters – where most/all the City is impacted by a major regional incident(s)

Volunteers will initially focus on the health and safety of themselves and their family. Then check on the welfare of their neighbors to understand the current neighborhood situation. When ready to function as a trained city volunteer, they will contact team members through rally points, FRS and Amateur Band radio to physically form functional teams. They will report to the EOC via Amateur Band radio or, if available, Public Safety radio their service status and situational reports from their neighborhoods. (See Appendix C – Beaverton CERT EOC Communications).

The CERT Repeater is the planned primary link between field Strike Teams and the EOC. Depending on available resources, the BEM Repeater is an alternative link to command. If the repeaters are not available, the VHF simplex frequency 147.480 MHz can be used as a command link. The VHF simplex frequency 147.560 is available as a tactical channel for command and team links

The teams will be directed by the EOC how to serve in their areas, communicating to the EOC via Amateur Band radio or, if available, Public Safety radio. The teams will maintain communication within their team with FRS and Amateur Band radio and inter-team with Amateur Band radio.

At the EOC volunteers, primarily the Communications Group, will provide secondary communication to local agencies, Washington County, State and Federal agencies utilizing Amateur Band radio, both voice and digital. They will provide primary communication to remote operating bases throughout the City and distant communications for welfare checks.

See Appendix D for the ICS 205 forms that list the channel and frequency details for volunteer communications.

3.6 Mitigating Communication Limitations

Use face-to-face communications wherever possible. For example, the co-location of all Command and General Staff at an Incident Command Post (ICP) provides the best direct communications and reduces the demand on communication system resources.

Enforce radio discipline. It is important that all volunteers observe communication procedures and discipline to enable limited frequencies and equipment to be used effectively and efficiently. By Incident Command System (ICS) guidelines, “clear text” (no codes) will be used by all personnel when talking on the radio and phone. PROWORDS are generally understood and accepted in this definition.

When available resources are insufficient to support every incident, resource assignments should be based on the priority levels articulated in the National Incident Management System (NIMS), i.e.:

- Life Safety
- Incident Stabilization
- Property Preservation

Overall communication efforts will be prioritized as follows:

- Tactical command and control and life safety communications
- Emergency coordination and support (e.g. Command-Team and Team-Team)
- Administrative and other uses

4.0 Roles and Responsibilities

4.1 General

For communications resources to be effectively used when needed, it is important for all volunteer organizations to take the following steps prior to any incident:

- *Plan* – Prepare and maintain plans to ensure readiness to deploy internal communications resources during major emergencies or disasters.
- *Equip* – Maintain readiness of communications equipment.
- *Train* – Educate volunteers on department or agency communication procedures to support deployment.
- *Exercise* – Conduct exercises and drills to ensure communication equipment is working and users maintain their skills operating the equipment.

4.2 Task Assignments

4.2.1 Central Volunteer Leadership

Publish policies and procedures for member notification and actions for each of the modes of operation.

Facilitate training and exercises that develop member communication competency per this plan.

For **scenario 1** – Training – Develop the Event Action Plan (EAP). Establish command hierarchy and assure that the communications procedures are clear to all participants.

For **scenario 2** – Planned Events – Develop and organize per the EAP. Report to and receive instruction from the overall event leadership and then establish the volunteer command hierarchy and assure that the instructions and communications procedures are clear to all volunteer participants. Appoint a Logistics leader to coordinate the event communications plan and deploy, maintain and account for equipment resources distributed to volunteer personnel. Maintain coordination and oversight of volunteer teams and direct the standdown procedures at the end of the event. Submit the After Action Report (AAR).

For **scenario 3** – Incident – Identify the volunteer leader (command) and determine the command hierarchy to Incident Command. Receive the assignment(s) for the volunteer teams. Establish the volunteer command hierarchy and assure that the instructions and communications procedures are clear to all volunteer participants. Appoint a Logistics leader to coordinate the event communications plan and deploy, maintain and account for equipment resources distributed to volunteer personnel. Maintain coordination and oversight of volunteer teams and direct the standdown procedures at the end of the incident. Submit the After Action Report (AAR).

For **scenario 4** – Disaster – The standup in a disaster will be very ad hoc. The volunteer field teams will assemble and establish team leadership. The team leadership will make team assignments. They will report, if possible, to the EOC with status and neighborhood situation reports and receive deployment assignments. The contact with the EOC, ideally, will be to the CERT Group Leader in EOC Operations, but may, initially, be to Amateur Radio Operators that have established the EOC Radio Room.

If contact is not possible with the EOC, then the volunteer teams will establish a field command across multiple teams to direct and coordinate the teams’ efforts until contact with the EOC is established.

At the EOC, a CERT Group Leader will be appointed, reporting into Operations. The CERT Group Leader will coordinate with the Operations Chief and Logistics Chief to establish reliable radio communication with the volunteer field teams. This likely will be with the Logistics Communication Unit Leader (COML) or designee. Together they will coordinate effective volunteer communications and develop the communications plan and deploy, maintain and account for equipment resources distributed to volunteer personnel.

4.2.2 Geographic Team Leadership

Develop, publish and train on policies and procedures for volunteer initial and ongoing communications for rally point “meetup” and intra-team communication.

4.2.3 Communications Group Logistics

Inventory, maintain and recommend acquisition and disposal of communication equipment owned by the City per the communications plan.

For **scenarios 1,2, & 3** support Emergency Management personnel and volunteer leadership by providing appropriate equipment and personnel for an event or incident.

For **scenario 4**, provide personnel resource to the EOC Communications Unit Leader or the EOC Logistics Chief for the coordination and deployment of communications equipment and volunteer personnel.

Maintain communications equipment and personnel supporting emergency communications between City EOC/ Emergency Management Program and identified local agencies, Washington County, State of Oregon and Federal agencies.

4.2.4 Training Teams

The Communications Group training section will take the leadership role in developing, publishing and training all volunteers on general communications equipment, policies and procedures.

The training teams in the volunteer groups will develop, publish and train their volunteers on communications equipment, policies and procedures specific to their areas of expertise and/ or geography. For example, a CERT GeoTeam leader develops the tactical procedures for rally points and inter-team communications.

5.0 Direction and Control

5.1 EOC Command Hierarchy

See Appendix A – Volunteer EOC Communications Structure.

The CERT Group will report into the Operations Chief and work directly with the Division Supervisor(s). Depending on the available personnel, CERT Command communications will be in the EOC Radio Room and report into the Communication Unit Leader in Logistics. In the early stages, the CERT radio person may act tactically and report directly to the CERT Group Leader.

Beaverton Communications Group volunteers will report to the Communication Unit Leader and, primarily, work in the EOC Radio Room.

The Incident Commander at the EOC has the authority to direct the use and deployment of City-owned communications resources, and to order additional resources, as necessary. This authority may be delegated to the Logistics Section Chief.

The Communications Unit Leader (COML) or Logistics Section Chief (LSC) will receive requests for communications resources and, as appropriate, match available resource requests with available resources. The COML or LSC may, with the approval of the Incident Commander, order additional resources as needed.

Technical management of communications resources may be further delegated to a qualified Communications Unit Leader, who will coordinate the use of interoperable assets with WCCCA Communications Coordinator and with other spectrum users. The Communications Unit Leader will submit a plan for incident communications to the Logistics Section Chief for approval.

5.2 Auxiliary Communication

The EOC Logistics Chief may activate amateur radio volunteers through the BCG to provide disaster communications or augment regular communications systems.

5.3 CERT Strike Teams

The EOC Operations Chief may activate CERT Strike Teams for disaster field response. CERT Group Leader(s) will coordinate these teams in Operations. The Group Leader(s) report to EOC Operations Division management or to the Operations Chief directly and receive direction from and report status to them. The CERT Group Leader(s) will establish and maintain tactical communications with the CERT Strike Teams through Logistics.

6.0 Administration and Logistics

6.1 Equipment

The volunteer BCG maintains the Emergency Management Program's communications equipment inventory and recommends acquisition and disposal of equipment.

An annual inventory of equipment is performed.

Maintenance includes regular review of equipment functionality, including batteries, repair, as necessary and replacement as needed.

6.2 Maintenance of Records

The following records are maintained on City systems for backup and retention:

- Equipment inventory and status
- Communications plans and procedures at all levels
- FCC licenses for all stations
- Repeater and equipment calibration/ test records
- License trustee information for amateur radio station
- Lists of authorized and trained operators of communications equipment
- Stores of necessary materiel (instructions, procedures, forms, etc.)

7.0 Document Development and Maintenance

The Communications Group maintains this document through scheduled reviews. The City Emergency Management Program Manager approves updates.

8.0 References

Emergency Management Volunteer Personally Identifiable Information (PII) Policy (in Revision)

City of Beaverton Emergency Operations Plan Communication Annex (in Revision)

Beaverton CERT Communications Field Operations Guide

The Washington County EOP Annex D Communications

9.0 Considerations and Planning

This section summarizes the outstanding concerns and plans for addressing current or expected issues with communications preparedness. Projects are defined as efforts whose scope and execution are well understood. Initiatives are efforts that require additional planning and research before they can become projects.

9.1 Projects

9.1.1 Public Safety UHF and VHF Base Transceivers

The EOC Gateway presently includes ICOM F521 (VHF) and F621 (UHF) transceivers (1 each). These units should be upgraded to Motorola units for greater sensitivity and better compatibility with the Motorola 8500 800MHz units in the EOC Gateway. They should have digital capability, but the timing for P.25 capability is part of the P.25 initiative.

9.1.2 Public Safety UHF and VHF Mobile Transceivers

The ICOM F221 (UHF) and F121 (VHF) mobile transceivers are used with the Radio Audio Bridge. They are currently kitted with an AC power supply. They should be upgraded for battery field operation compatible with the battery project.

9.1.3 Radio Audio Bridge

The present Tracer Technology Tactical Communications Bridge should be upgraded for battery field operation compatible with the battery project. Cable should be purchased or fabricated to provide full capability with the HT cache and the Public Safety Mobile Transceivers. A second unit should be acquired to support large or multiple events and as a backup unit.

9.1.4 Field Antenna Pouches

The field Ham kits require the common resource of a pouch that includes the antenna, cable, mast, tripod and minimal other accessories to get the radio on the air. The material has largely been purchased and needs to be assembled and inventoried as common pouches. The minimal accessories, and the container for such, must be identified and acquired.

9.1.5 Backup Base Radio Station

The Maloney box is designed to provide backup to primary Ham communications if the Public Safety Center must be evacuated. There are questions as to the suitability of the HF tuner, the HF antennas to be used, and the battery operating capability. These questions must be resolved, and upgrades applied, as necessary.

9.1.6 Interim Ham Digital Field Stations

The initiative of the same name will be the long-term solution. This project pulls together the bits and pieces that we have presently to make 2-3 functional Winlink stations and a mechanism for EOC support.

9.1.7 AM Transmitter

The AM transmitter includes a personal computer and software to store and select multiple standard messages for rapid access. These messages must be updated and adequate documentation generated for creating and selecting messages and operating the transmitter.

9.1.8 City Council Handheld Radios

City Management (Mayor, City Manager, City Council) require a means to communicate with each other and with the EOC in a disaster. The plan is to deploy Handheld Public Safety Band radios to them for this purpose. The current plan is to use existing ICOM F11 HTs.

9.2 Initiatives

9.2.1 Transition to Public Safety P.25 capability

In the future, the Emergency Management radio operations will naturally transition to digital P.25 capability. This could be driven by Beaverton Police support, Public Works support and/or the broader need to support multiple City and volunteer communication needs with a limited number of repeaters available. The radio cache should gradually transition to digital capability with the upgrade to P.25 when the City demand warrants it. A transition year has not yet been identified.

The transition plan will address the following points:

1. The transition and planned size of the VHF and UHF HT radio cache. The present cache and spares are sufficient for events, incidents and disasters for today's plans.
2. The transition and planned size of the VHF and UHF Mobile radio cache. The present cache and spares are sufficient for events, incidents and disasters for today's plans.
3. The value and necessity of one or more UHF repeaters for BPD disaster operations.
4. The value and necessity of one or more UHF repeaters for Public Works daily and disaster operations.
5. The value and necessity of additional repeaters for other City departments.
6. The timing for the above repeaters and the further transition to P.25 capability.
7. The transition from the current Beaverton School District VHF repeater frequency pair to a City-licensed pair.

9.2.2 New Repeater Siting

The present Maverick repeater site has coverage issues, particularly with the UHF Ham Repeater. Two additional sites have been identified on Mount Williams and Cooper Mountain. The timing of the construction will be driven by decisions on the P.25 Transition initiative. Several siting issues must be resolved:

1) Is the WCCCA tower site on Williams available and practical for our use?
2) What is the timing and location of the City water tower on Williams? Is there room for our pole and shed without the water tower blocking our signal?
3) What is the timing and location of the City water tower on Cooper?
4) Should our pole and shed be near Kemmer Rd or close to the water tower?
5) In the interim, should support be established for a temporary tower for use in a disaster?

9.2.3 Ham Field Support 'Go' Boxes

There are presently two battery powered dual band (2m/70cm) radio units in water resistant cases and an associated pouch with tripod, mast, antenna, cable and minimal accessories. These are planned to support field teams that otherwise do not have radios capable of communicating with the EOC. They could operate at a staging area or as cross-band repeaters for mobile field teams. How many of these are needed?

9.2.4 Ham Digital Field Stations

The plan calls for radio stations that support six Beaverton Operation Bases (BOBs) placed in some of up to 15 preselected locations. These stations must be digital capable due to the volume of expected resource and status traffic. The number of planned BOBs may expand in the future. The present method is Winlink. What technologies should be explored prior to investing in equipment for additional stations? What is the estimated investment required for 6 stations and the incremental expense for additional stations?

10.0 Appendices and Tables

A. Volunteer EOC Communications Structure

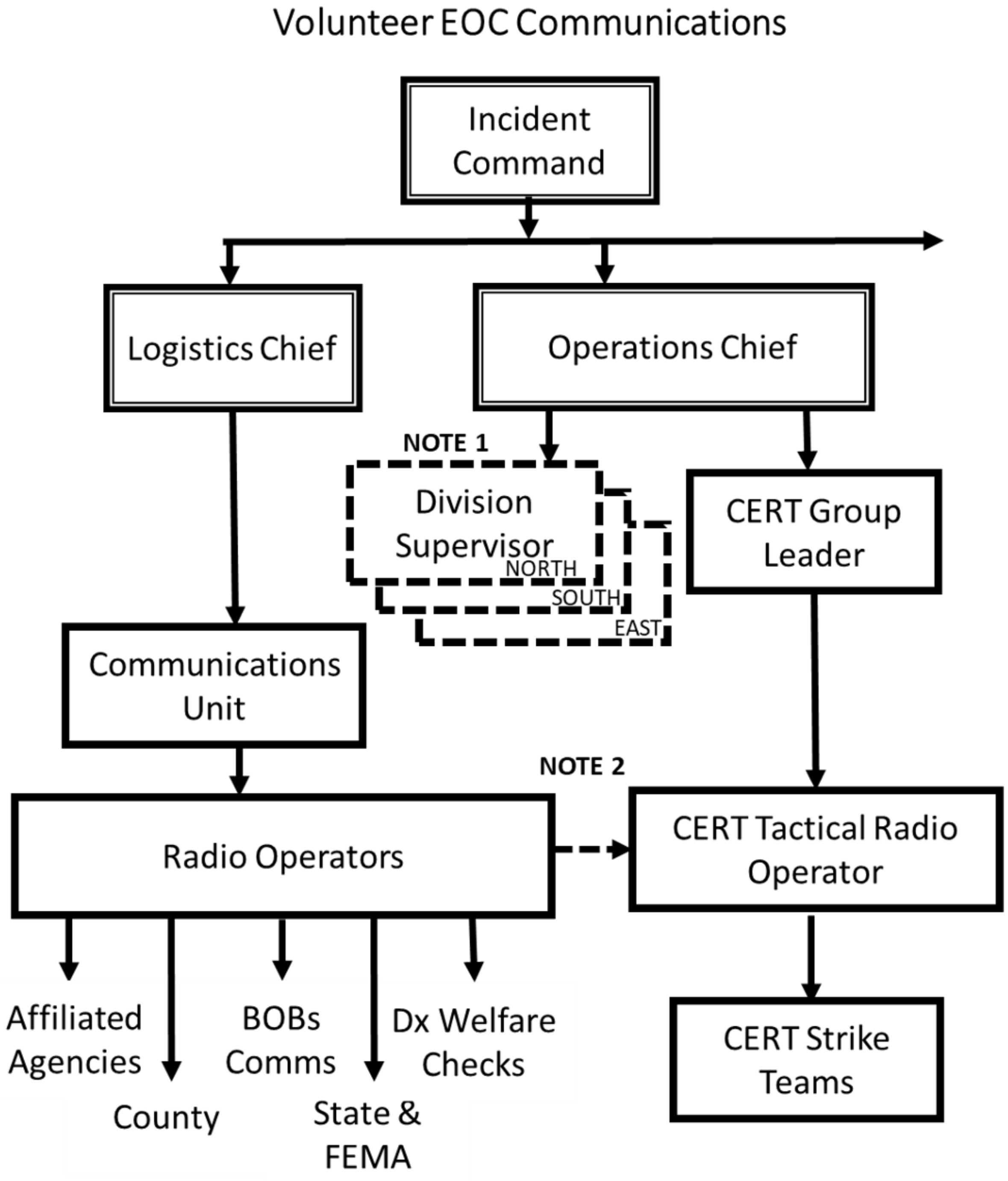
B. CERT Event Communication

C. CERT EOC Communication for Disasters

D. ICS 205 Communications Plan

E. Definitions of Commonly Used Terms

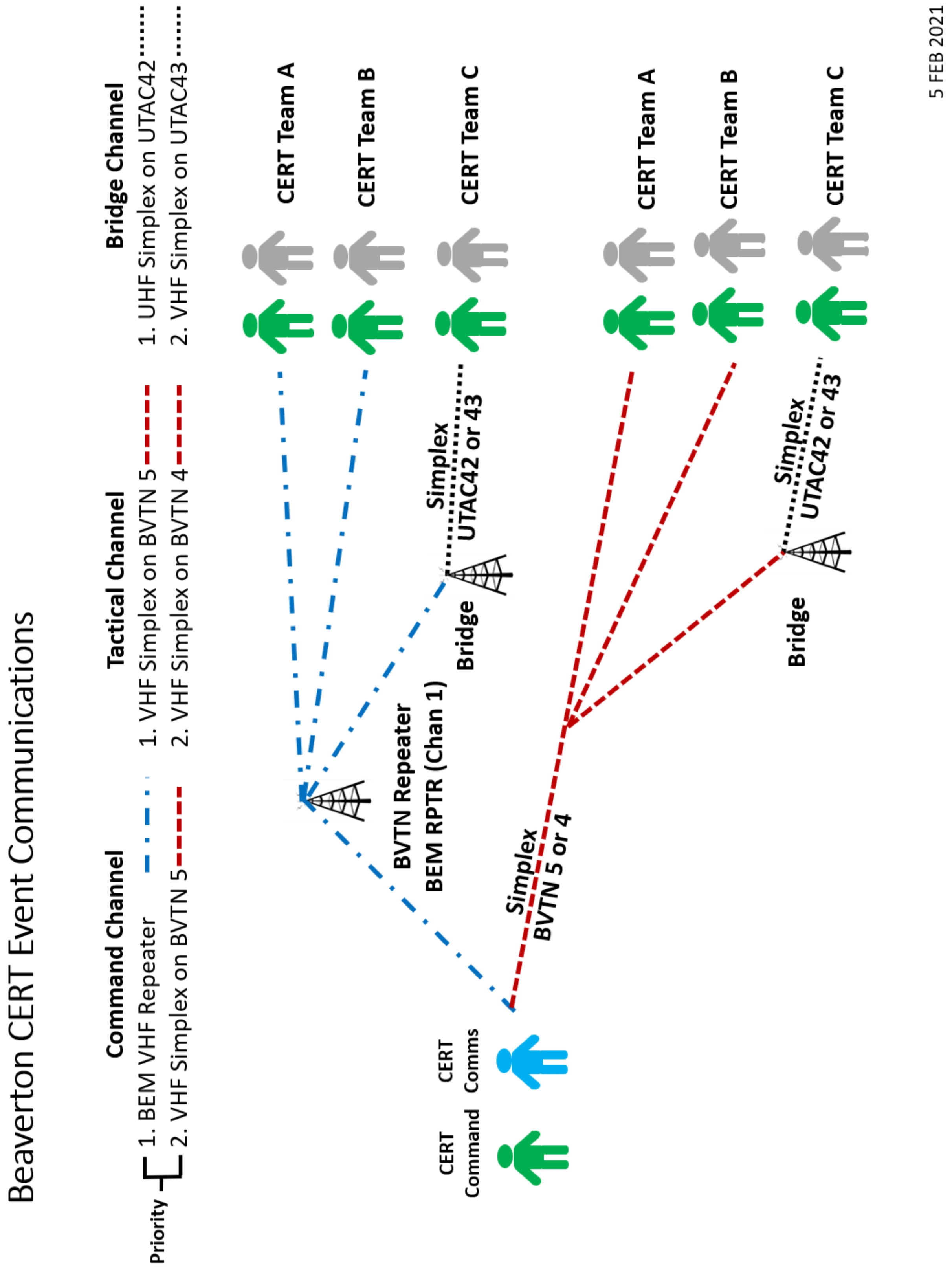
A. Volunteer EOC Communications Structure


Volunteer EOC Communications
Incident Command
Logistics Chief
Operations Chief
NOTE 1
Division Supervisor
NORTH
SOUTH
EAST
CERT Group Leader
Communications Unit
NOTE 2
Radio Operators
CERT Tactical Radio Operator
Affiliated Agencies
County
BOBs Comms
State & FEMA
Dx Welfare Checks
CERT Strike Teams

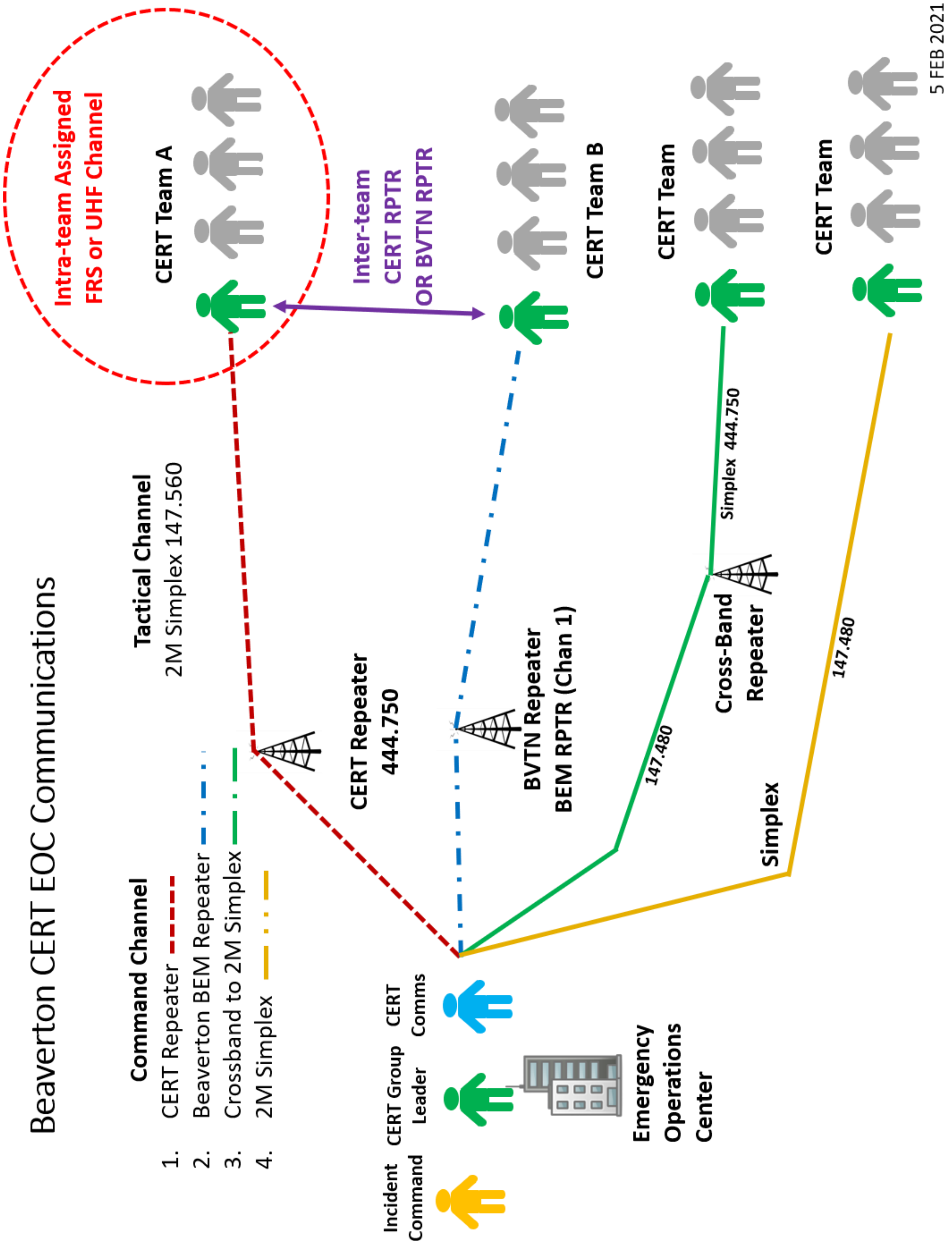
Note 1: Divisions are included for clarity. The CERT Group will support all divisions.
Note 2: Radio Room personnel report into Communications. Optionally, independent CERT Tactical communications may report directly to the CERT Group Leader.

5 FEB 2021

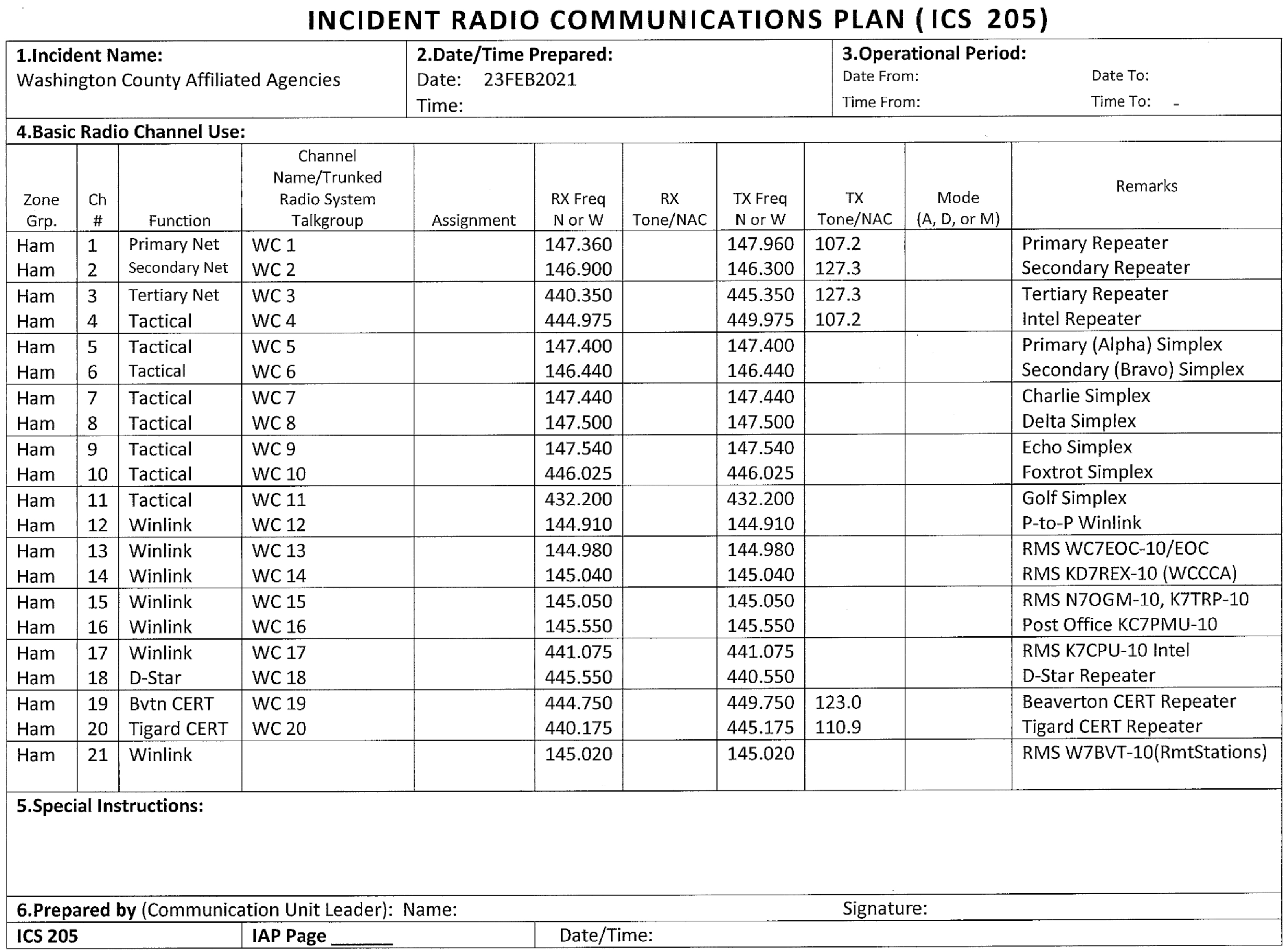
B. CERT Event Communication


Beaverton CERT Event Communications
Priority
Command Channel
1. BEM VHF Repeater
2. VHF Simplex on BVTN 5
Tactical Channel
1. VHF Simplex on BVTN 5
2. VHF Simplex on BVTN 4
Bridge Channel
1. UHF Simplex on UTAC42
2. VHF Simplex on UTAC43
CERT Command
CERT Comms
BVTN Repeater
BEM RPTR (Chan 1)
Simplex
BVTN 5 or 4
Bridge
Simplex
UTAC42 or 43
Bridge
Simplex
UTAC42 or 43
CERT Team A
CERT Team B
CERT Team C
CERT Team A
CERT Team B
CERT Team C
5 FEB 2021

C. CERT EOC Communication for Disasters


Beaverton CERT EOC Communications
Command Channel
1. CERT Repeater
2. Beaverton BEM Repeater
3. Crossband to 2M Simplex
4. 2M Simplex
Tactical Channel
2M Simplex 147.560
Intra-team Assigned
FRS or UHF Channel
CERT Team A
Inter-team
CERT RPTR
OR BVTN RPTR
CERT Team B
CERT Team
CERT Team
5 FEB 2021
CERT Repeater
444.750
BVTN Repeater
BEM RPTR (Chan 1)
147.480
Cross-Band
Repeater
Simplex 444.750
Simplex
147.480
Incident
Command
CERT Group
Leader
CERT
Comms
Emergency
Operations
Center

D. ICS 205 Communications Plans



INCIDENT RADIO COMMUNICATIONS PLAN (ICS 205)

1.Incident Name:
Washington County Affiliated Agencies

2.Date/Time Prepared:
Date: 23FEB2021
Time:

3.Operational Period:
Date From: Date To:
Time From: Time To: -

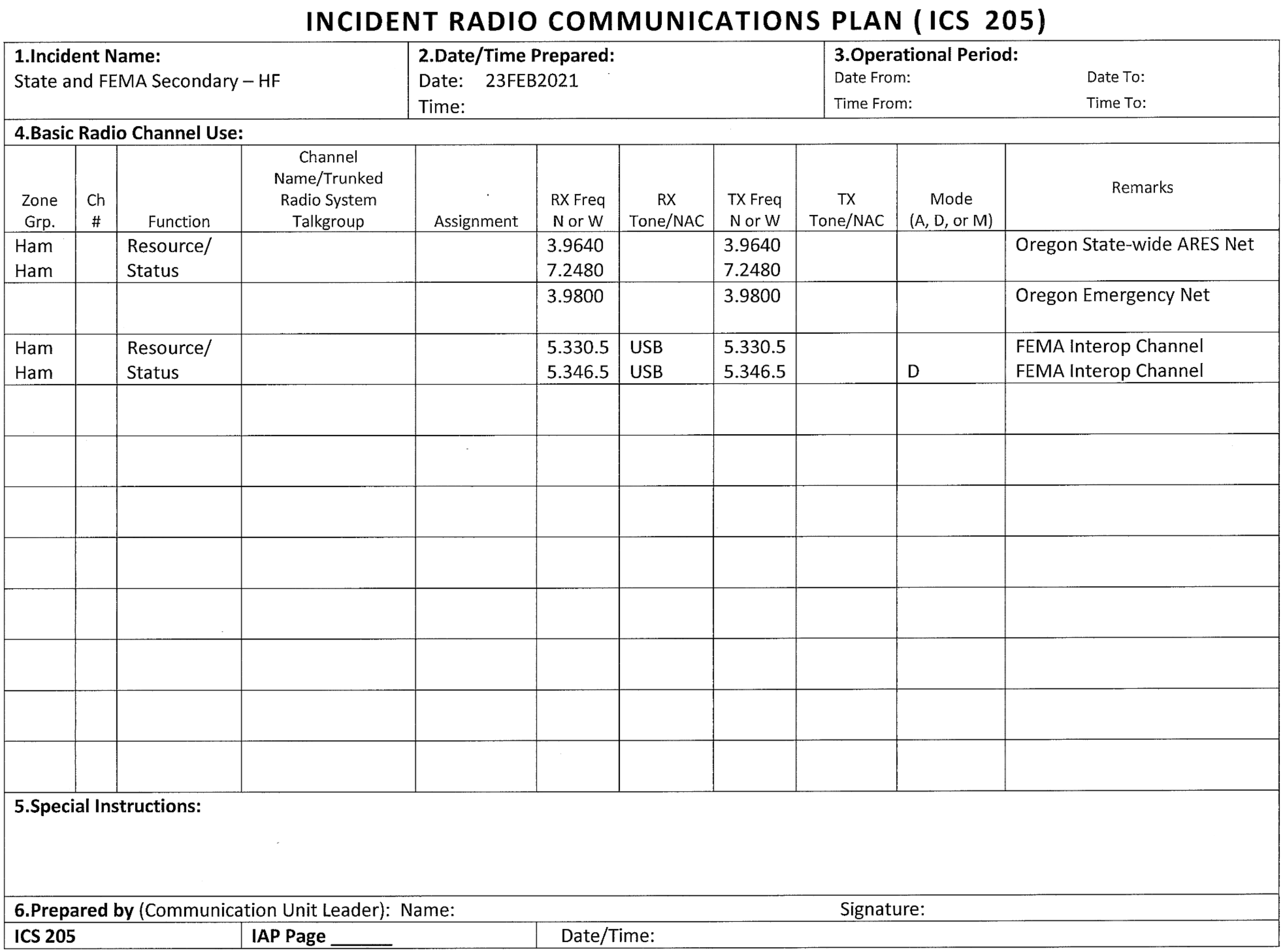
4.Basic Radio Channel Use:

Zone Grp.	Ch #	Function	Channel Name/Trunked Radio System Talkgroup	Assignment	RX Freq N or W	RX Tone/NAC	TX Freq N or W	TX Tone/NAC	Mode (A, D, or M)	Remarks
Ham	1	Primary Net	WC 1		147.360		147.960	107.2		Primary Repeater
Ham	2	Secondary Net	WC 2		146.900		146.300	127.3		Secondary Repeater
Ham	3	Tertiary Net	WC 3		440.350		445.350	127.3		Tertiary Repeater
Ham	4	Tactical	WC 4		444.975		449.975	107.2		Intel Repeater
Ham	5	Tactical	WC 5		147.400		147.400			Primary (Alpha) Simplex
Ham	6	Tactical	WC 6		146.440		146.440			Secondary (Bravo) Simplex
Ham	7	Tactical	WC 7		147.440		147.440			Charlie Simplex
Ham	8	Tactical	WC 8		147.500		147.500			Delta Simplex
Ham	9	Tactical	WC 9		147.540		147.540			Echo Simplex
Ham	10	Tactical	WC 10		446.025		446.025			Foxtrot Simplex
Ham	11	Tactical	WC 11		432.200		432.200			Golf Simplex
Ham	12	Winlink	WC 12		144.910		144.910			P-to-P Winlink
Ham	13	Winlink	WC 13		144.980		144.980			RMS WC7EOC-10/EOC
Ham	14	Winlink	WC 14		145.040		145.040			RMS KD7REX-10 (WCCCA)
Ham	15	Winlink	WC 15		145.050		145.050			RMS N7OGM-10, K7TRP-10
Ham	16	Winlink	WC 16		145.550		145.550			Post Office KC7PMU-10
Ham	17	Winlink	WC 17		441.075		441.075			RMS K7CPU-10 Intel
Ham	18	D-Star	WC 18		445.550		440.550			D-Star Repeater
Ham	19	Bvtn CERT	WC 19		444.750		449.750	123.0		Beaverton CERT Repeater
Ham	20	Tigard CERT	WC 20		440.175		445.175	110.9		Tigard CERT Repeater
Ham	21	Winlink			145.020		145.020			RMS W7BVT-10(RmtStations)

5.Special Instructions:

6.Prepared by (Communication Unit Leader): Name: Signature:

ICS 205 **IAP Page** ______ Date/Time:



INCIDENT RADIO COMMUNICATIONS PLAN (ICS 205)

1.Incident Name: State and FEMA Secondary – HF	**2.Date/Time Prepared:** Date: 23FEB2021 Time:	**3.Operational Period:** Date From: Date To: Time From: Time To:

4.Basic Radio Channel Use:

Zone Grp.	Ch #	Function	Channel Name/Trunked Radio System Talkgroup	Assignment	RX Freq N or W	RX Tone/NAC	TX Freq N or W	TX Tone/NAC	Mode (A, D, or M)	Remarks
Ham Ham		Resource/ Status			3.9640 7.2480		3.9640 7.2480			Oregon State-wide ARES Net
					3.9800		3.9800			Oregon Emergency Net
Ham Ham		Resource/ Status			5.330.5 5.346.5	USB USB	5.330.5 5.346.5		D	FEMA Interop Channel FEMA Interop Channel

5.Special Instructions:

6.Prepared by (Communication Unit Leader): Name: Signature:

ICS 205 **IAP Page** ______ Date/Time:

INCIDENT RADIO COMMUNICATIONS PLAN (ICS 205)

1.Incident Name: CERT Radio Template	**2.Date/Time Prepared:** Date: 23FEB2021 Time:	**3.Operational Period:** Date From: Date To: Time From: Time To:

4.Basic Radio Channel Use:

Zone Grp.	Ch #	Function	Channel Name/Trunked Radio System Talkgroup	Assignment	RX Freq N or W	RX Tone/NAC	TX Freq N or W	TX Tone/NAC	Mode (A, D, or M)	Remarks
1	1	PRIM CMD	BCRTRP		444.750		449.750	123.0		Primary Command Channel
1	2	Talkaround	BCRTTA		444.750		444.750			Repeater Talkaround
1	3	Command	BCRTS1		147.480		147.480			Primary Simplex
1	4	Tactical	BCRTS2		147.560		147.560			Secondary Simplex

5.Special Instructions: Channel 4 is shared with Lake Oswego CERT

CONTINUED ON PAGE 2

6.Prepared by (Communication Unit Leader): Name: Signature:

ICS 205	**IAP Page** ______	Date/Time:	**Page 1 of 2**

INCIDENT RADIO COMMUNICATIONS PLAN (ICS 205)

1.Incident Name: CERT Radio Template	**2.Date/Time Prepared:** Date: 23FEB2021 Time:	**3.Operational Period:** Date From: Date To: Time From: Time To:

4.Basic Radio Channel Use:

Zone Grp.	Ch #	Function	Channel Name/Trunked Radio System Talkgroup	Assignment	RX Freq N or W	RX Tone/NAC	TX Freq N or W	TX Tone/NAC	Mode (A, D, or M)	Remarks
1	5	Team	ORANGE1		431.1250		431.1250			Primary Orange
1	6	Team	ORANGE2		431.0500		431.0500			Secondary Orange
1	7	Team	GREEN1		431.2750		431.2750			Primary Green & Grey
1	8	Team	GREEN2		431.2250		431.2250			Secondary Green & Grey
1	9	Team	BLUE1		431.0250		431.0250			Primary Blue
1	10	Team	BLUE2		432.1250		432.1250			Secondary Blue
1	11	Team	RED1		432.1500		432.1500			Primary Red
1	12	Team	RED2		432.1750		432.1750			Secondary Red
1	13	Team	YELLOW1		431.1750		431.1750			Primary Yellow
1	14	Team	YELLOW2		432.2250		432.2250			Secondary Yellow
1	15	Team	TEAL1		431.0750		431.0750			Primary Teal
1	16	Team	TEAL2		445.5000		445.5000			Secondary Teal
1	17	Team	GREY1		431.2750		431.2750			Primary Grey & Green
1	18	Team	GREY2		431.2250		431.2250			Secondary Grey
1	19		NVCALL		146.5200		146.5200			National VHF Calling
1	20		NUCALL		446.0000		446.0000			National UHF Calling
1	21	Interop	WORC2m		145.4700		144.8700	107.2		Western OR Radio Rptr 2m
1	22	Interop	WORC70		443.4250		448.4250	107.2		Western OR Radio Rptr 70
1	23	Interop	WC1		147.3600		147.9600	107.2		WCARES Primary Repeater
1	24	Interop	WC2		146.9000		146.3000	127.3		WCARES Secondary Repeater
1	25	Interop	TGRDTA		440.1750		445.1750	110.9		Tigard CERT Repeater
1	26	Interop	TGRDTA		440.1750		440.1750			Tigard CERT Rptr Tlkaround

5.Special Instructions: **PAGE 2 of 2**

6.Prepared by (Communication Unit Leader): Name: Signature:

ICS 205	**IAP Page** ______	Date/Time: **Page 2 of 2**

INCIDENT RADIO COMMUNICATIONS PLAN (ICS 205)

1.Incident Name: Bvtn EM VHF Template	**2.Date/Time Prepared:** Date: 23FEB2021 Time:	**3.Operational Period:** Date From: Date To: Time From: Time To:

4.Basic Radio Channel Use:

Zone Grp.	Ch #	Function	Channel Name/Trunked Radio System Talkgroup	Assignment	RX Freq N or W	RX Tone/NAC	TX Freq N or W	TX Tone/NAC	Mode (A, D, or M)	Remarks
1	1	Command	BEM RPTR		160.1775	110.9	152.9375	110.9		N
1	2	Cmd/Tac	Beaverton1		154.650	156.7	154.650	156.7		N
1	3	Bvtn Law	City Law		155.010	156.7	155.010	156.7		N
1	4	Tactical 2	Beaverton2		155.565	156.7	155.565	156.7		N
1	5	Tactical 1	BEM TAC		160.1775	110.9	160.1775	110.9		N
1	6	CntyInterop	V-CALL		155.7525	156.7	155.7525	156.7		N
1	7	InteropTac1	V-TAC1		151.1375	156.7	151.1375	156.7		N
1	8	InteropTac2	V-TAC2		154.4525	156.7	154.4525	156.7		N
1	9	InteropTac3	V-TAC3		158.7375	156.7	158.7375	156.7		N
1	10	InteropTac4	V-TAC4		159.4725	156.7	159.4725	156.7		N
1	11	InteropR1	V-TAC36		151.1375	136.5	159.4725	136.5		N
1	12	InteropR2	V-TAC37		154.4525	136.5	158.7375	136.5		N
1	13	InteropR3	V-TAC38		158.7375	136.5	159.4725	136.5		N
1	14	Bv Interop	BEM INOP		155.0475	110.9	151.2275	110.9		N
1	15	BEM RPT Tlk	BEMR TALK		160.1775	110.9	160.1775	110.9		N
1	16	BEM IOP Tlk	BEMI TALK		155.0475	110.9	155.0475	110.9		N

5.Special Instructions:

6.Prepared by (Communication Unit Leader): Name: Signature:

ICS 205 **IAP Page** ______ Date/Time:

INCIDENT RADIO COMMUNICATIONS PLAN (ICS 205)

1.Incident Name:
BEM UHF 1

2.Date/Time Prepared:
Date: 23FEB2021
Time:

3.Operational Period:
Date From: Date To:
Time From: Time To:

4.Basic Radio Channel Use:

Zone Grp.	Ch #	Function	Channel Name/Trunked Radio System Talkgroup	Assignment	RX Freq N or W	RX Tone/NAC	TX Freq N or W	TX Tone/NAC	Mode (A, D, or M)	Remarks
1	1	UnivCall Rp	UCALL40		453.2125		458.2125	156.7		N
1	2	Tactical	UTAC41		453.4625		458.4625	156.7		N
1	3	Tactical	UTAC42		453.7125		458.7125	156.7		N
1	4	Tactical	UTAC43		453.8625		458,8625	156.7		N
1	5	UnivCall Sx	UCALL40D		453.2125					N
1	6	Tactical Sx	UTAC41D		453.4625					N
1	7	Tactical Sx	UTAC42D		453.7125					N
1	8	Tactical Sx	UTAC43D		453.8625					N
1	9	SO SAR	SOSAR1		460.375	100	465.375	100		N
1	10	SO SAR	SOSAR2		460.150	100	465.150	100		N

5.Special Instructions:

6.Prepared by (Communication Unit Leader): Name: Signature:

ICS 205 **IAP Page** ______ Date/Time:

E. Definitions of Commonly Used Terms

Analog – For the purpose of this plan, analog refers to radio communications or systems that use a continuous function of non-quantized variances in frequency and amplitude to propagate information via radio waves. The 800 MHz trunked radio system is currently an analog system.

Amateur Radio Operators (ARO) – Volunteer radio operators trained to assist maintaining communications across multiple agencies during a disaster.

ARES – *Amateur Radio Emergency Service* – A volunteer amateur radio organization under the auspices of the American Radio Relay League, which provides emergency communications support using amateur radio equipment and frequencies during emergency or disaster situations. In Washington County, ARES volunteers are concurrently identified as RACES volunteers. (See RACES)

AUXCOMM - A term that stands for " Auxiliary Emergency Communications ". **AUXCOMM** plays an important role during events, incidents, and disasters. **AUXCOMM** volunteer operators assist agencies at the local, state, and national levels during events, incidents, and disasters when called upon to do so.

Bandwidth – The amount of information, whether analog or digital, that can be carried by a communications system during a specific time, i.e., the size of the "pipe" that carries voice or data communications. As it relates to radio systems, bandwidth is limited by the number of frequency pairs (think traffic lanes) allocated to a system. This limits the number of users who can simultaneously use the system.

Beaverton Communications Group (BCG) – Communications volunteers assisting the City Emergency Management Program planning and staging communications needs.

Beaverton Operations Base (BOB) [PROPOSED]– Stations established remote from central command from which emergency response personnel operate during a disaster. Agencies represented may include Beaverton Police, Tualatin Valley Fire and Rescue (TVF&R), Beaverton CERT, Red Cross, County Medical Reserve Corps (MRC).

COML – *Communications Unit Leader* – Designs, orders, manages, and ensures the installation and maintenance of all communications systems. A certified COML is a NIMS ICS position in the Logistics Section.

COMT – *Communications Unit Technician* – Maintains and repairs communications equipment under the direction of the COML. A certified COMT is a NIMS ICS position in the Communications Unit of the Logistics Section.

Digital – A digital system is a data technology that uses discrete (discontinuous) values, i.e., ones and zeroes. By contrast, non-digital (or analog) systems represent information using a continuous function. The 800MHz Trunked System is transitioning to digital technology.

Disaster – A major incident, or series of incidents, impacting most/all the City where resources cannot respond normally.

ECC – *Emergency Coordination Center* – Essentially the functional equivalent of an EOC. The use of *coordination* rather than *operations* is intended to indicate the center's primary focus on coordination of resources versus the direct command of on-scene operations.

EOC – *Emergency Operations Center* – During major emergency or disaster operations, the City EOC establishes strategic goals for City and citywide activities, manages resources and information, and coordinates with other city, county, state and other agencies. The EOC is generally responsible for coordinating public information, resource allocation decisions, and policy decisions on a citywide basis.

EOP – Emergency Operations Plan – A comprehensive document that details the planning, execution and responsibilities for the City's response to a major emergency or disaster.

Events – Meetings, field training and exercises that have been planned in advance.

Event Action Plan (EAP) – A document created for volunteer planned events that describes the who, what and how of the event, including the specific communication plan.

Family Radio Service - An improved walkie-talkie radio system authorized in the United States since 1996. This personal radio service uses channelized frequencies around 462 and 467 MHz in the Ultra High Frequency (UHF) band. Formal licensing is not required.

Frequency – An established slice of radio spectrum used for simplex communications, e.g., 155.805 MHz.

Gateway – Facilitates communication across multiple radio systems by using Radio Over Internet Protocol (ROIP) technology for audio and control. In addition to radios, the network nodes can include consoles, telephones and other communication devices.

GHz – *Gigahertz* – Equal to one billion hertz.

Ham – A shorthand for the set of frequencies used by Amateur Radio Operators. These include HF (High Frequency), VHF, and UHF radios bands.

Hz – *Hertz* – A unit of frequency defined as the number of cycles per second of a periodic phenomenon. In radio, hertz is used to describe a radio frequency sine wave.

IP – Internet Protocol.

Incident – A unplanned event where volunteers are called up to quickly assist in adherence to established procedures. A walkaway from a Senior home is an example where the Police request immediate assistance by volunteers.

Incident Action Plan (IAP) – A series of documents that together form the detailed plan for responding to an incident, large or small. The communications plan and assignments are included in the plan.

Interoperability – Interoperability is the ability of public safety agencies to talk across disciplines and jurisdictions via radio communications systems, exchanging voice and/or data with one another on demand, in real time, when needed, and as authorized.

- The federal government has established a set of federal interoperability channels across the radio spectrum that can be programmed into local radios. The National Interoperability Field Operations Guide (NIFOG) has information on channel programming as well as rules governing the use of these channels.
- Locally, the Portland UASI Tactical Interoperability Communications Plan (TICP) contains agreed upon standard operating procedures for the joint use of local, state and federal radio spectrum during an emergency or disaster.

Map Your Neighborhood – A training program for neighborhood residents to work together for mutual assistance after a disaster.

MHz – *Megahertz* – Equal to one million hertz.

Operation SECURE – *State Emergency Communications Using Radio Effectively* is a high-frequency (HF) radio network that provides a secondary emergency backup communications capability for intra- and inter-state use.

P.25 – A multi-layered digital protocol for Public Safety Radio that supports trunking, encoded and encrypted communication.

POTS – *Plain Old Telephone Service* – A POTS line consists of a telephone on a desk and a single pair of copper wires between the phone and the CO.

Public Safety Radio – A set of radio frequencies set aside for public safety and other municipal agencies.

RACES – *Radio Amateur Civil Emergency Service* – A standby radio service created by the Federal Emergency Management Agency (FEMA) and the Federal Communications Commission in accordance with FCC Regulations (Title 47, Part 97.407). RACES volunteers serve their respective jurisdictions pursuant to guidelines and mandates established by local emergency management officials. (See ARES)

Radio Audio Bridge – A device that connects the audio and transmit control between two radios**,** providing interoperability between otherwise exclusive systems. Can be used to support field operation in a weak signal area, such as communication within a building to field personnel.

Radio Channel – A name given to a frequency or frequency pair that describes the intended use. An example would be the non-federal VHF channel known as VTAC 34 which is a coordinated pair of radio frequencies that are used in a radio repeater for interoperability.

Served Agencies – Designated agencies within the County served by an organized group of radio volunteers.

Simplex – Radio communication between two mobile or portable radios using a single radio frequency, without the benefit of a repeater or trunked system. Simplex communication is generally restricted to line of site, although in ideal circumstances that can still be several miles.

Tactical Interoperability Communications Plan (TICP) – The TICP is intended to document what interoperable communications resources are available within the urban area, how to access each resource, and what rules or operational procedures exist for activation and deactivation of each resource.

TRS – *Trunked Radio System* – The concept of a trunked system is similar to a cellular phone system. It uses a system of geographically dispersed repeaters and a finite number of frequencies to support many individual radio users. Because everyone is not using the radio at the same time, a trunked system can support literally hundreds of "talk groups" using a much smaller number of actual channels

UASI – The *Urban Areas Security Initiative* – The Portland area UASI is a coordinated grant program involving Clark County in Washington and Multnomah, Clackamas, Columbia and Washington counties in Oregon.

UHF – *Ultra High Frequency* – The segment of the radio frequency spectrum between 300 MHz and 3 GHz.

VHF – *Very High Frequency* – The segment of the radio frequency spectrum between 30 – 300 MHz.

WCCCA – *Washington County Consolidated Communications Agency* – Washington County's Public Safety Answering Point (PSAP). This is the central point where 911 calls are answered and assistance is dispatched.

Windshield Survey – A reconnaissance conducted to assess the scope of the problem and identify response priorities in a first response area.

WebEOC – An Internet (web) based software application that provides a "Virtual EOC" environment that can be viewed by authorized users wherever an Internet connection exists.