Presented below is a scenario that illustrates how the First InterComm System supports the Department of Homeland Security's SAFECOM Program Statement of Requirements (SOR) for Public Safety Wireless Communications and Interoperability.

This scenario was extracted from Version 1.0 of the Statement of Requirements (SOR), dated March 10, 2004. The scenario has been modified to illustrate how the First InterComm system could be used to provide interoperable voice communications and a wireless mesh network in support of the "Fire Response to a Residential Fire Call" scenario from section 3.3.2, beginning on page 10.

In the scenario, text from the original Statement of Requirements (SOR) is *shown in italics*. Hypothetical utilization of the First InterComm system is shown in blue text.

The first section walks through the fire response scenario and the second section provides the fire communications summary.

3.3.2 Fire Response to a Residential Fire Call

1. At 3:17 a.m., the Brookside PSAP receives a 9-1-1 call from a cab driver that the apartment building at 725 Pine is smoking and appears to be on fire. From the CAD display, the dispatcher finds that the BFD-7 station is available and close to the address. The dispatcher notifies BFD-7 to send E7 and L7, and to send BFD-7 battalion chief as the fire's incident commander (IC). As E7 is leaving the fire station, firefighter F788 jumps onto the back of the vehicle. The vehicle registers that F788 has become part of the E7 crew for accountability and tracking. The dispatcher simultaneously sends a digital message providing the apartment building's address. The dispatcher notifies another Brookside Fire Department, BFD-12, to also send an engine to the fire (E12). By 3:19 a.m., E7, L7, and the incident commander leave BFD-7 and report their status to the dispatcher. As the incident commander's command vehicle leaves the station, a nearby wireless PSCD sends the apartment's building plans and the locations of nearby fire hydrants, the building's water connections, the elevator, and the stairwells to the command vehicle's GIS. The dispatcher sends a reverse 9-1-1 call message to all residents of the building, which has eight apartments on each of three floors. The nearest ambulance (A34) is alerted by the dispatcher to proceed to the scene. The local utility is alerted to stand-by for communications with the IC at 725 Pine.

2. The E7, L7, and IC drivers view the apartment's address on the cab monitor displays, which also maps the route for the drivers; a computer-activated voice tells the drivers what lane to be in and which turns to make. As the fire vehicles approach traffic lights along the route, the on-board signaling system changes the lights to the emergency vehicles' favor and the geo-location system provides the vehicles' location and progress on the dispatcher's CAD display. The on-board system also interrogates the county's transportation system for road closures,

blockages, train conflicts, or slow traffic conditions to route the vehicles around impediments and provide the fastest route to the fire.

3. The IC arrives on scene at 3:22 a.m., his First InterComm unit automatically activates when he puts his vehicle in park, assesses the situation, noting that smoke and fire are visible, and alerts dispatch that 725 Pine is a working fire. The local utility truck (T5) arrives on scene and his First InterComm unit automatically activates and autonomously connects in an ad hoc fashion to the IC First InterComm unit to establish an incident area network (IAN). The IC changes his radio to the IAN channel and directs the local utility, over the First InterComm IAN, to shut off the gas to 725 Pine. As L7 and E7 arrive and get into position, their First InterComm unit automatically connects to the established IAN and registers resulting in all fire personnel and equipment being shown on the IC's GIS display. The First InterComm system automatically sets up the tactical communications channels for the IC and the fire crews. The fire crews are able to talk continuously with each other, reporting conditions and warning of hazards. Because the apartment building is not large enough to require a built-in wireless incident area network for emergency services, the first fire crew into the apartment drops selforganizing wireless First InterComm IAN pods on each of the floors at they progress through the building. Soon E12 and the assigned EMS unit arrive on site and their First InterComm unit automatically connects to the First InterComm IAN and register with the IC commander. Figure 1 shows a communication layout at the scene of incident and how the First InterComm system provides a temporary network between the first responders from different responding agencies.
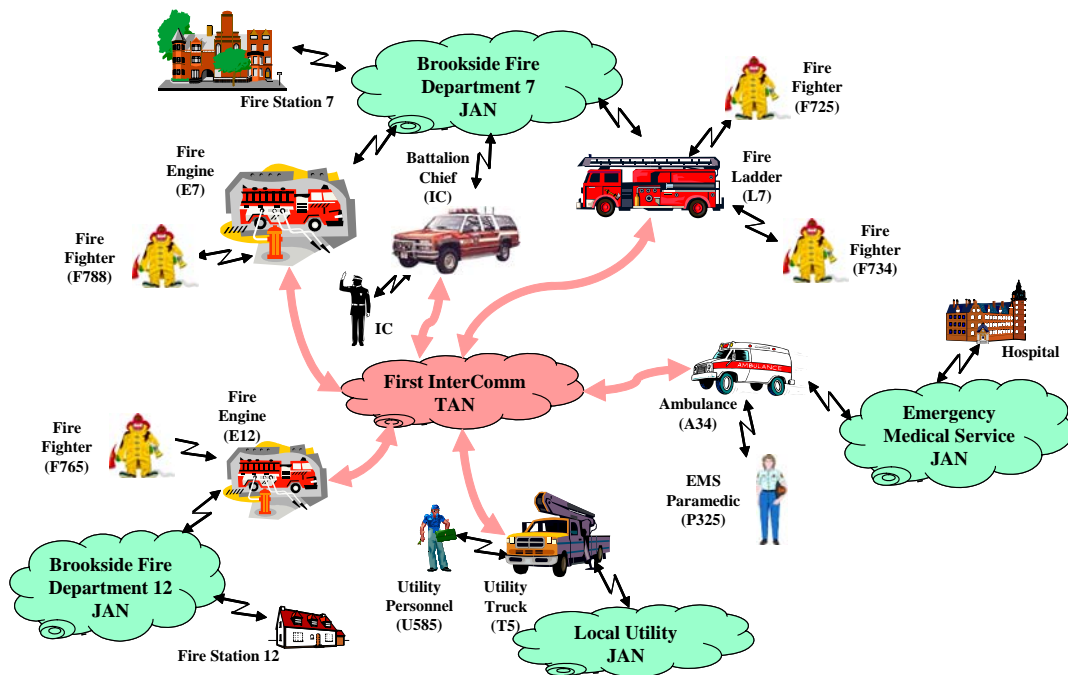

Figure 1 IAN for a Fire Response to a Residential Fire Call

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4. Several families have already evacuated the building. As firefighters ask for their names and apartment numbers, they use the voice recognition capabilities of their PSCDs to capture the information, applying an RF ID wrist strap to each resident to track their status and location. Other firefighters enter the building to guide survivors out and to rescue those who are trapped. The IR cameras on the firefighter's helmets pass video over the First InterComm IAN to provide the IC a view of fire conditions within the building and where the hot spots are located. Additionally, the firefighters monitor the temperature of the surrounding air in their location; this information is directly available to the firefighter, as well as the IC and EMS unit on-scene over the First InterComm IAN. Other passive sensors, such as hazardous gas detectors, are also operating in the firefighter's PAN and this data is distributed over the First InterComm IAN. With the IC's guidance, the firefighters search each apartment for survivors and the source of the fire. The IC is able to monitor the location of each firefighter and is aware of which apartments have been searched by the information provided on the GIS displays.

5. The EMS unit outside the apartment uses the First InterComm IAN to monitor the vital signs of all the firefighters in and around the fire scene. The unit alerts the IC that firefighter F725 is showing signs of distress and the IC orders F725 and his partner F734 out of the building for a check-up with the EMS team.

6. Firefighter F765 pushes his emergency button when he becomes disoriented in the smoke. The emergency call is sent as a priority message over the First InterComm IAN to the IC where an alarm is generated and a communication path is established between the IC and firefighter F765. The IC immediately directs firefighter F788 to his aid by providing F765's location relative to F788.

7. While the firefighters check every apartment for victims, the main fire is discovered in a second floor apartment kitchen where an electric range is burning. Two adults and two children are discovered in the apartment suffering from smoke inhalation. RF IDs are attached to their arms and each is given an oxygen tank and mask to help their breathing. They are carried outside the building where the EMS unit is ready to take over medical aid.

8. While the firefighters put out the fire in apartment 202, the IC checks the GIS display, which shows where the fire personnel are and where all the survivors and rescued individuals live in the apartment building. Two top-floor apartments have not been searched and the IC moves fire personnel to those apartments. The apartment database indicates an invalid may be living in apartment 321. The firefighters break down the doors of both apartments and in 321 find a bedridden individual, who is in good condition, and a pet dog in the other apartment. Both are outfitted with RF ID devices and taken from the building.

9. The fire is brought under control. The IC releases E12 and the IC disconnect E12's First InterComm units from the active talkgroup. E7 and L7 wrap their fire operations and A34 has to transport one fire victim to the hospital. The IC releases all remaining equipment, disconnects their First InterComm units from the active talkgroup, and gives control to dispatch.

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3.3.2   Fire Communications Summary

Throughout the scenario, the fire personnel and equipment, EMS support personnel, and the fire victims interoperate over the First InterComm temporary, area network. They are tracked by the First InterComm network providing geo-location information in real time, providing the Incident Commander with current accountability of public safety personnel and of the fire's victims. All victim information and vitals are recorded through the First InterComm wireless monitors and voice recognition systems with no reliance on paper reports and notes. All fire personnel and equipment have monitors to measure vital conditions and status that are reported by the wireless PAN and First InterComm IAN systems to the IC's GIS. The GIS also has access to city building department databases, which are searched and queried for building information and plans, fire hydrant locations, etc.

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