

APPENDIX A: PRIORITIZED PROJECT ISSUES

Ranking	Area	Topic
10	Accountability (Integrating Personal Accountability Systems (PAS) with Communications)	<ul style="list-style-type: none"> • Integrating PAS with communications • Electronic accountability • Automatic vehicle location • Electronic command boards
10	Communication Planning and Coordination	<ul style="list-style-type: none"> • Through building (into/out of) • Underground • In building
10	Grants	<ul style="list-style-type: none"> • Small business grants – who and what (if information available)
10	Monitoring Firefighter Welfare and Location On-Scene	<ul style="list-style-type: none"> • Role/responsibility of dispatchers. • Use of field communications units and communications coordinators • Remote monitoring • Vital signs • Location
10	Reliability Issues	<ul style="list-style-type: none"> • Line-of-sight limitations • Underground (subways, parking garages) • Confined space rescue • Communication into and out of buildings (especially high-rises) • Intermittence • Communication coverage/dead spots
10	Reliability Issues – Interference	<ul style="list-style-type: none"> • Communicating into buildings • Radio propagation through fire, heat and smoke
10	Unsuitable Equipment	<ul style="list-style-type: none"> • Frequency band unsuitable for structure/ground penetration

Ranking	Area	Topic
2	Reliability Issues	<ul style="list-style-type: none"> • Equipment Failure • Mechanical/technical issues (unstable equipment, radio malfunction) • Concerns about reliability of 800-MHz digital systems • Failure observability • Field testing prior to implementation • Radios introduced into fire stations without field testing • Interference • Atmospheric • Electronic • Built environment (tunnels, high-rise buildings, shipboard) • Jamming (terrorism) • Reliability of 800 MHz digital technology/reliability of Motorola XTS 3500R digital systems • Repeater performance/repeater infrastructure • Environmental (hills, foliage, mountainous terrain, distance) • Acknowledgement of message
2	Unsuitable Equipment	<ul style="list-style-type: none"> • Most equipment adapted from other uses • Unable to communicate from inside using full personal protective equipment
1	Communication Planning and Coordination	<ul style="list-style-type: none"> • Coordination of ground-to-ground and air-to-ground communications • Lack of integrated communication planning (frequency coordination) • Failure to use ICS correctly or at all • Inadequate ability to receive, disseminate, and analyze information • No backup data – command post destroyed as in World Trade Center • Vehicle/unit tracking – geo-location • Intra- and interagency communications
1	No Equipment	<ul style="list-style-type: none"> • Some firefighters lack radios

Ranking	Area	Topic
Not Investigated	Ergonomics	<ul style="list-style-type: none"> • Human factors receiving little attention • Develop additional skill sets • Stress-tempered communication skills • Survival simulator (similar to airline pilot virtual reality simulator) • Radio discipline • Cultural factors • Unwillingness to call for help • Inadequate training and personnel performance • Performance issues on complex multi-channel/multi-mode radio systems • New systems must be learnable/focus on learn-ability • Unfamiliarity with the use of new radio equipment • Ability to deploy and manage new technology • Resistance to new technology • Difficulty communicating while wearing SCBA • Current adaptations (speech ports, face piece integrated microphones, intercom systems, portable radio interfaces, throat mikes, bone mikes, etc) receive mixed reviews

Ranking	Area	Topic
Not Investigated	Inadequate System Capacity	<ul style="list-style-type: none"> • During complex, multi-alarm incidents with many operating units attempting to communicate • Number of frequencies available vs. number of people attempting to use those frequencies • Legal process to acquire • Lack of repeaters/repeating infrastructure • Opportunities to test and deploy portable, mobile, air-based and stationary repeaters • Portable radios needed for all firefighters • Should be considered a critical item of personal protective equipment akin to SCBA • Every firefighter (or two-person team) working in a hostile environment should have a portable radio with emergency distress feature • Radio spectrum deficiencies • Work at federal level to secure enough radio spectrum • Radio spectrum interoperability for public safety • Department of Defense report re. progress on 138-144-MHz band overdue • Commercial applications (e.g., Nextel) • Cell phones • System capacity • ACU1000 – mixer – multiple frequencies patched (IC only use)
Not Investigated	Unsuitable Equipment	<ul style="list-style-type: none"> • Firefighters must use SCBA and communicate effectively • Needed: a better portable radio specifically designed for the structural firefighting environment • Physically robust system • Waterproof • Ruggedized/shock resistant • Able to withstand high heat environment • Designed to be easily operable with heavy gloves in a hostile environment • Observability of LCD displays in low light conditions • Concerns over triggering radio controlled bombs and terrorist devices • Black box recorder • Battery life, interchangeability