

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554**

In re:	)	
	)	
M2Z NETWORKS, INC.	)	File No.
	)	
Application for License and Authority to	)	
Provide National Broadband Radio Service	)	
in the 2155-2175 MHz Band	)	
	)	

**APPENDIX 4**

**M2Z'S PROPOSAL  
TO SERVE PUBLIC SAFETY ENTITIES**

## **M2Z'S PROPOSAL TO SERVE PUBLIC SAFETY ENTITIES**

1. Our nation has become increasingly aware of the importance of public safety entities. These agencies include the nation's first responders in times of crisis (such as firefighters, police officers, and ambulance services). The communications needs of such entities are considerable. With lives in the balance, public safety entities require first class, secure, uninterrupted and interoperable communications to maintain safety for their members and the public they serve. Unfortunately, the United States does not have an interoperable<sup>1</sup> public safety network capable of serving the critical data needs of first responders. In the light of the constant risk of either man-made or natural disasters, this deficiency has been a key concern for policy makers.
2. Congress expressed its concern in Section 7502 of the Intelligence Reform Act, which directs that the Commission "shall, in consultation with the Secretary of Homeland Security and the National Telecommunications and Information Administration, conduct a study to assess short-term and long-term needs for allocations of additional portions of the electromagnetic spectrum for Federal, State, and local emergency response providers . . . ."<sup>2</sup> In making the Congressional assessment, the Commission was directed to: (1) seek input from Federal, State, local, and regional emergency response providers regarding the operation and administration of a potential nationwide interoperable broadband mobile communications network; and (2) consider the use of commercial wireless technologies to the greatest extent practicable.<sup>3</sup>

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<sup>1</sup> Interoperability is defined by the Commission as a communications link within public safety and public wireless systems that permits units from different entities to interact with each other and exchange information. See Federal Communications Commission, *Report to Congress on the Study to Assess Short-Term and Long-Term Needs or Allocations of Additional Portions of the Electromagnetic Spectrum for Federal, State and Local Emergency Response Providers*, Appendix B at 1 (rel. Dec. 19, 2005) ("Report to Congress").

<sup>2</sup> *Intelligence Reform and Terrorism Prevention Act of 2004*, PL 108-458, § 7502(a) (Dec. 17, 2004).

<sup>3</sup> *Id.* at § 7502(c)(1)-(2), Study Requirements.

3. The Commission responded to the Congressional mandate when it issued its Report to Congress in December 2005.<sup>4</sup> After seeking comment from all interested parties, most notably, public safety entities, the Commission acknowledged that there is a place for dual use commercial networks that can both enable commercial communications and help serve the needs of the public safety community.<sup>5</sup> Working with commercial entities is particularly worthy because such networks will likely help ameliorate the key challenges facing public safety—the need for interoperability and affordability.<sup>6</sup>

4. Critically, the use of commercial networks will help create an affordable public safety solution. Various public safety organizations have estimated that the costs of building out a nationwide, interoperable network could be as much as \$18 billion.<sup>7</sup> The Department of Homeland Security (“DHS”) and Public Safety organizations have estimated that the cost of replacing the existing public safety land mobile radio systems to achieve interoperability could reach \$40 billion.<sup>8</sup>

5. This level of funding simply does not exist. In fact, public safety agencies around the country have identified lack of funding as a primary obstacle to interoperability.<sup>9</sup> Similarly, the Department of Homeland Security stated that public safety agencies have been plagued by “inadequate and unreliable wireless communications”<sup>10</sup> for decades, and that they are often “unable to share vital voice or data information with other jurisdictions” in response to incidents that jeopardize the public safety.<sup>11</sup> DHS further concluded that interoperability, which is

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<sup>4</sup> See *Report to Congress*.

<sup>5</sup> See *id.* at ¶¶ 45-49. See also Appendix B to *Report to Congress* at 1-2 (“Public safety entities may also benefit from partnering with commercial wireless providers to leverage technological advances and enter into mutually beneficial network agreements, especially with respect to non-mission critical duties.”).

<sup>6</sup> See *id.* at ¶¶ 45-46. See also Appendix B to *Report to Congress* at 2-3.

<sup>7</sup> See *Report to Congress* at ¶ 25.

<sup>8</sup> See *The State of Public Safety Communications*, International Symposium on Advanced Radio Technologies, SAFECOM (March 2, 2004) at 9, available at [www.safecomprogram.com](http://www.safecomprogram.com).

<sup>9</sup> *Id.*

<sup>10</sup> See *Statement of Requirements of Public Safety Wireless Communications and Interoperability*, The SAFECOM Program, Department of Homeland Security, January 26, 2006 at 1 (“*Statement of Requirements*”).

<sup>11</sup> *Id.*

currently lacking in public safety entities' communications systems, is a vital element in securing the safety of U.S. citizens.<sup>12</sup>

6. No doubt, the creation of a nationwide interoperable broadband communications network is a tall order. The good news is that M2Z will enable first responders to have seamless nationwide data communications that can supplement their existing systems with no recurring costs to the first responders or federal and state governments.

### **I. M2Z's Network Will Help Solve the Interoperability Problem and Provide Significant Benefits to First Responders**

7. As explained elsewhere in this Application, M2Z proposes to provide the first free nationwide broadband wireless network in the United States.<sup>13</sup> While consumers will be able to enjoy the vast benefits of this network, M2Z's deployment will provide numerous public safety benefits to first responders. M2Z plans to deploy an IP-based fixed wireless network that will support fixed and mobile devices and provide full interoperability to public safety agencies. M2Z's network will have significant scale and reach. Indeed, by the terms of the conditions under which M2Z must operate, at least 95% of the U.S. population will have access to its network within the next decade.<sup>14</sup> This will enable the rapid implementation of broadband wireless infrastructure for public safety interoperability over virtually the entire country. Moreover, as explained below, M2Z has entered into a strategic relationship with PacketHop to deliver additional security-oriented applications to public safety entities.

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<sup>12</sup> *Id.*

<sup>13</sup> See Application at 2-3.

<sup>14</sup> The 5% of the U.S. population that may not have guaranteed coverage is due to the lack of backhaul from other networks and other provisioning issues beyond M2Z's control. Nonetheless, M2Z will make all reasonable efforts to provide 100% coverage as it builds out its network.

**A. M2Z’s Network Will Provide Free Interoperable and Secure Broadband Connections to the Public Safety Community**

8. M2Z’s network will provide free 512 kbps (384 Kbps download and 128 Kbps upload) service to every registered public safety user who purchases M2Z certified customer premise equipment (“CPE”), which will be available through various retailers and local Internet service providers (“ISPs”). M2Z’s certified CPE will seamlessly operate on both wide area networks (“WANs”) and local area networks (“LANs”). The CPE has the operational capacity to accomplish this because it will include dual radios: one radio operating in the WAN mode using M2Z’s multi-users advanced antenna system (“AAS”) orthogonal frequency division multiple access (“OFDMA”) technology; and another radio operating using WiFi radios operating on various unlicensed bands, including 2.4 GHz and 5.47-5.85 GHz bands in the LAN mode.<sup>15</sup>

9. Getting M2Z’s CPE in the hands of a significant number of public safety entities is feasible. SAFECOM has estimated that the number of firefighters in the U.S. is approximately 960,000; the number of law enforcement officials totals roughly 710,000; and EMS personnel number about 830,000, for a total of approximately 2,500,000 public safety officials. Assuming an initial cost of \$250 for each piece of CPE, every public safety official in the country could utilize this service for an estimated \$625,000,000. That is a minuscule figure compared to the \$40 billion estimated by DHS to achieve public safety interoperability.

**B. M2Z’s Partnership with PacketHop Will Provide Additional Valuable Subscription-Based Applications to First Responders**

10. While M2Z’s Basic Service will provide a robust base level of secondary data connectivity to public safety officials, M2Z recognizes that there are a number of additional features, above and beyond raw data connectivity, that would provide additional tools to public safety. For that reason, M2Z has partnered with PacketHop ([www.packethop.com](http://www.packethop.com)) to make each

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<sup>15</sup> The radios will also be capable of functioning on 4.9 GHz.

M2Z First Responder modem embedded with the ability to activate PacketHop's First Responder optimized software applications.<sup>16</sup>

11. PacketHop's technology allows wireless devices to communicate directly with each other on a peer-to-peer basis. It does so by forming an instant short-range mobile mesh network. By loading cutting edge software onto standard IP radio-equipped (e.g., 802.11) such as the M2Z CPE device, the mobile mesh networking creates a self-organizing wireless communications network in which every mobile device becomes a network router. Such a network promotes instant connectivity with other devices in the mesh network. In such an environment, wireless communications are not dependent on the distance to the nearest access point or base station. Rather, the only key distance is the amount of terrain separating each wireless device.

12. PacketHop's technology is well suited for responding to an emergency. In the event that network infrastructure is unavailable or compromised, fixed network infrastructures such as base stations or access points are not required in order to provide communications between devices. Moreover, unlike other mesh systems, PacketHop's solution does not require special infrastructure or access points. Thus, where infrastructure exists, PacketHop's technology permits communication outside the network and thus acts as an extension to existing networks. Indeed, PacketHop's applications meet the DHS requirements for secure interoperable data communications systems for public safety networks.<sup>17</sup> This additional level of connectivity can be accessed by first responder organizations as a subscription service by working directly with PacketHop and its activation partners.

13. The PacketHop software, which is well tested and is currently deployed today, will allow public safety officials to perform a variety of multimedia applications that are especially important for multi-jurisdictional first responders. Some PacketHop benefits are detailed below.

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<sup>16</sup> PacketHop's software enables autonomous mesh networks and server-less broadband applications running on open standard networks (802.11). See <http://www.packethop.com/company/>.

<sup>17</sup> See *Statement of Requirements* at 22.

- **Real-time Multicast Video Application:** Live video can be invaluable for assessing a situation and responding with maximum effectiveness. Multiple high-quality video feeds can be selectively multicast and viewed individually or concurrently; new video feeds can be quickly provisioned at any time.
- **Resource Tracking Application:** High-resolution maps with real-time resource location tracking show who is at a scene and where they are at any time, using the Global Positioning System (“GPS”) receiver in their device.
- **Multimedia Instant Messaging Application:** In addition to text-based instant messages, users can share files in a variety of formats - including documents, spreadsheets, diagrams, still digital photographs and selected video frames.
- **Whiteboarding Application:** Two or more users can share tactical information graphically (e.g. annotate a map, video frame, or other image) and collaborate on a course of action. This virtual whiteboard is especially powerful in situations where it is impossible or impractical to meet in person.
- **Security Policy Management Application:** Public safety entities will enjoy the authentication and authorization of users, equipping them with the credentials needed to participate in the PacketHop-enabled autonomous mobile mesh network.
- **IT Management and Administration:** The PacketHop system enables secure account management, provisioning, logging, configuration setting, maintenance and other IT management tasks.

**C. M2Z is Committed to Work with DHS and Public Safety Entities to Optimize its Network for Public Safety Applications**

14. As part of its network deployment, M2Z pledges to build such additional network facilities as necessary to serve public safety entities that plan to use the National Broadband Radio Service when it becomes available in their area. Further, to the extent public safety entities require uninterrupted service, M2Z will work with them to achieve that goal. If the Commission believes that it is necessary, M2Z will seek modification of its license after grant in order to make any necessary changes to implement our discussions with the public safety community. In addition, for the provision of enhanced services to public safety entities beyond the National Broadband Radio Service, M2Z is working with PacketHop, a company experienced in serving the needs of first responders to bring the benefit of applications optimized for their needs.<sup>18</sup>

**II. Conclusion**

15. M2Z's network will provide an invaluable enhancement to public safety entities' communications systems. Because M2Z will provide its National Broadband Radio Service for free (with low one-time CPE costs), even small public safety agencies with limited IT/telecom budgets will now be able to obtain high-speed and reliable broadband data services to supplement their existing systems. Moreover, through M2Z's partnership with PacketHop, first responders will have a suite of useful applications available at any incident site.

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<sup>18</sup> Information on PacketHop's Public Safety and Government services is available at [http://www.packethop.com/markets/public\\_safety.php](http://www.packethop.com/markets/public_safety.php). In addition, on April 22, 2006, PacketHop demonstrated its technology at the large U.S. public safety and homeland security field exercise held at Long Beach, California. See press release available at [http://www.packethop.com/news\\_events/press\\_releases/2006/042406.php](http://www.packethop.com/news_events/press_releases/2006/042406.php).