



**OMESH Networks Incorporation**  
[www.omeshnet.com](http://www.omeshnet.com)  
3 Kilkenny Drive  
Toronto ON, Canada M1W1J3  
Tel: 1-416-837-8980  
Fax: 1-416-977-2796  
Email: [info@omeshnet.com](mailto:info@omeshnet.com)

## Applicable Areas

Emergency wireless networking presents a set of civic/military applications where the network infrastructure cannot be pre-planned due to time or other limitations. Examples exist in battlefields, public safety, and earthquake/tsunami relief among others. Despite the lack of any network infrastructure in those applications, high-performance and secure wireless communications among a large number of users (terminals) are usually required. In addition, the communication terminals are usually of high mobility.

Because of scalability constraints and the fact that wireless-communication quality degrades quickly with the number of wireless hops, currently in-use wireless networks do not support such communications adequately. OMesh's solution for emergency wireless networking processes the unique value of providing a fluid mesh network with a large number of dynamic users (terminals) of high mobility. It further supports reliable data/voice/video communications, and establishes instantaneous connection among the users without any pre-configuration.



**Emergency Wireless Networking**

## Principles of the Solution

The core technology of this solution is OPM (Opportunistic Mesh) Networks (or Large-scale Cognitive Networks). OPM can dynamically establish large wireless networks among mobile terminals without predetermined topology constraint and spectrum allocation, and support high mobility for the user terminals. It also uniquely provides reliable and real-time (multi-hop) wireless communications over unlimited number of wireless hops. Since the radio transmission power is limited to reaching its neighboring terminals, it provides physical-layer security against adversaries in sensitive environments.

More specifically in emergency wireless networks, the technology advantages of OPM translate to:

- Supporting instantaneous ad-hoc communications among a large number of terminals with high mobility; performance improving with larger network scale;
- Supporting reliable real-time data/voice/video (push-and-talk) sessions among mobile terminals over unlimited number of wireless hops;
- Adaptable to interference in unlicensed bands and low radio transmission power, providing radio-level security against adversarial jamming and eavesdropping;
- Compatible with established network layer standards, providing easy interface to external networks and applications;
- Low power consumption; low cost and small footprint.

## Technology Comparison

Here is a comparison of different wireless solutions to the emergency-network applications:



	WiFi	Satellite	<b>OPM</b>
Scalability/Reliability	Usually 100-200 meters from AP	Limited to outdoor environments	<b>Unlimited multi-hop wireless</b>
Application Bandwidth	High	Low-Medium	<b>High</b>
Real-time Communications	Partially	Supported	<b>Supported</b>
Terminal Mobility	Low	High	<b>High</b>
Security Risks	Medium	High	<b>Low</b>
Power Consumption	>1W per unit	>1W per unit	<b>Depends on RF technology</b>
Cost	Medium	High	<b>Low</b>
External Networks	Supported by additional gateway	Supported	<b>Supported by additional gateway</b>