

# Crossbow Technology

**Enabling Anywhere, Anytime,  
Wireless Network Solutions**

**Presented By  
Mike Horton  
President & CEO  
Crossbow Technology  
[www.xbow.com](http://www.xbow.com)**

# Crossbow History

- **Founded by Mike Horton and A. Richard Newton in 1995**
  - Founders instrumental in MEMS technology at UC – Berkeley
  - Headquarters, San Jose CA
- **Successfully installed in over 1,000 customer applications**
- **500,000 intelligent sensors installed in a variety of markets**
- **MEMS Accel/Tilt/Mag Sensors – 1995 to Present**
- **First MEMS Based Gyro – 1997 to Present**
  - FAA Certified January 2003
- **Smart Dust & Wireless Sensor Networks – 2001 to Present**

# Smart-Dust Applications

- **Automotive**
- **Building Automation**
- **Food Warehousing**
- **Factory Automation**
- **Machine Health Monitoring**
- **Power Line Monitoring**
- **Security / Surveillance**
- **Utilities**

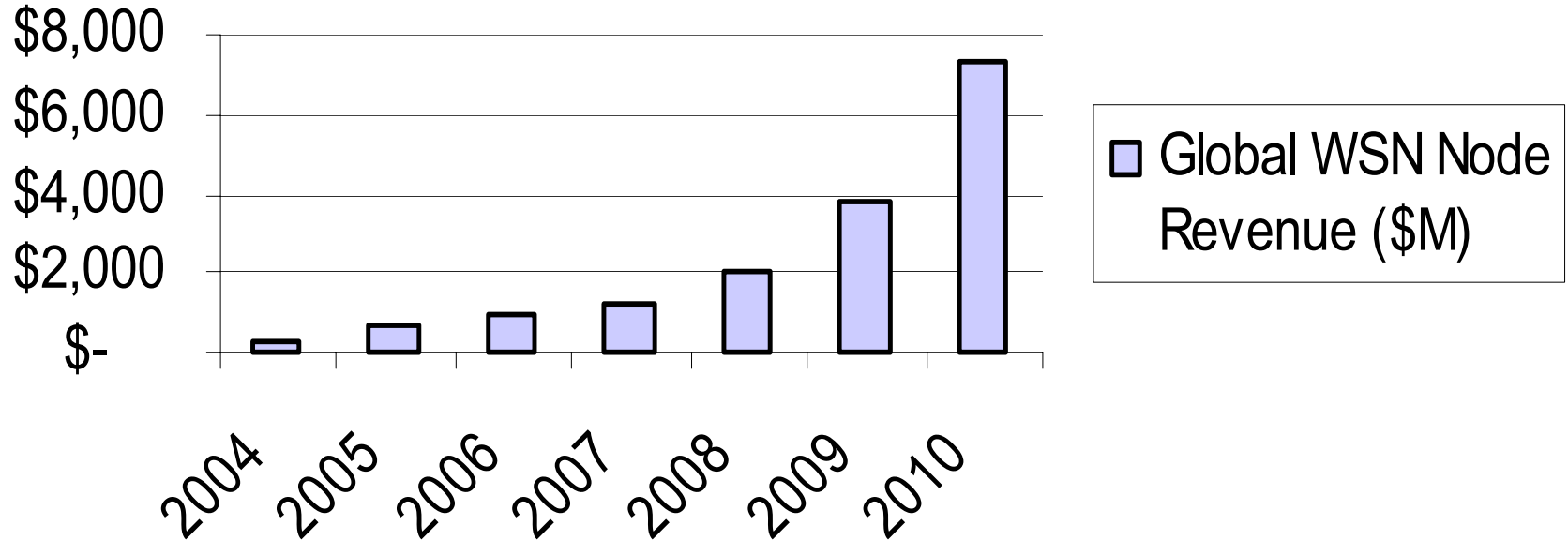
# Smart-Dust Market Stages

- **Pilots** **2001-2003**
  - Proof-of-ROI
  - \$100-\$1000/node
- **Ramp-up** **2004-2006**
  - Reliability, Integration
  - \$10-\$100/node
- **New Applications Emerge** **2007-2010**
  - Consumer-Driven, Cost, Size
  - \$1-\$10/node

Source: OnWorld 2004

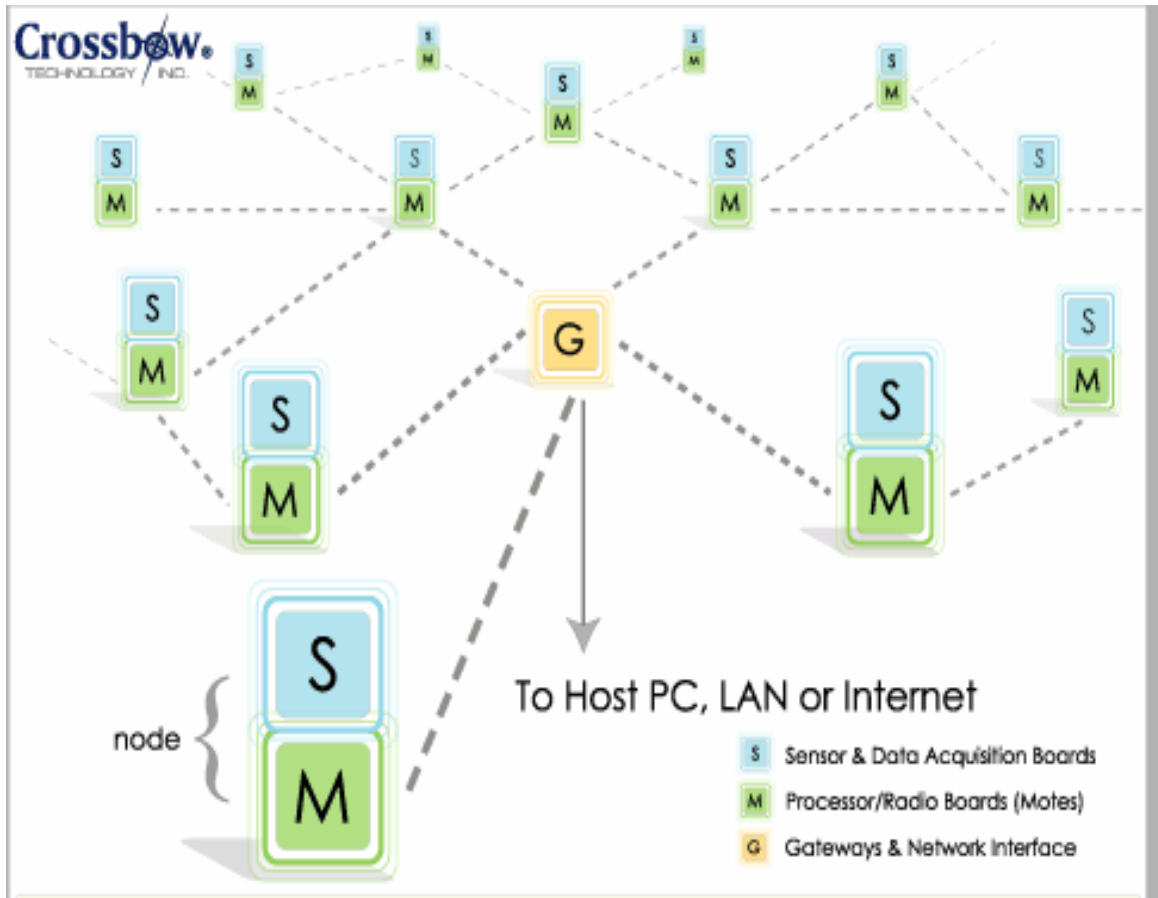
# Smart-Dust Market Size

Global WSN Node Revenue (\$M)



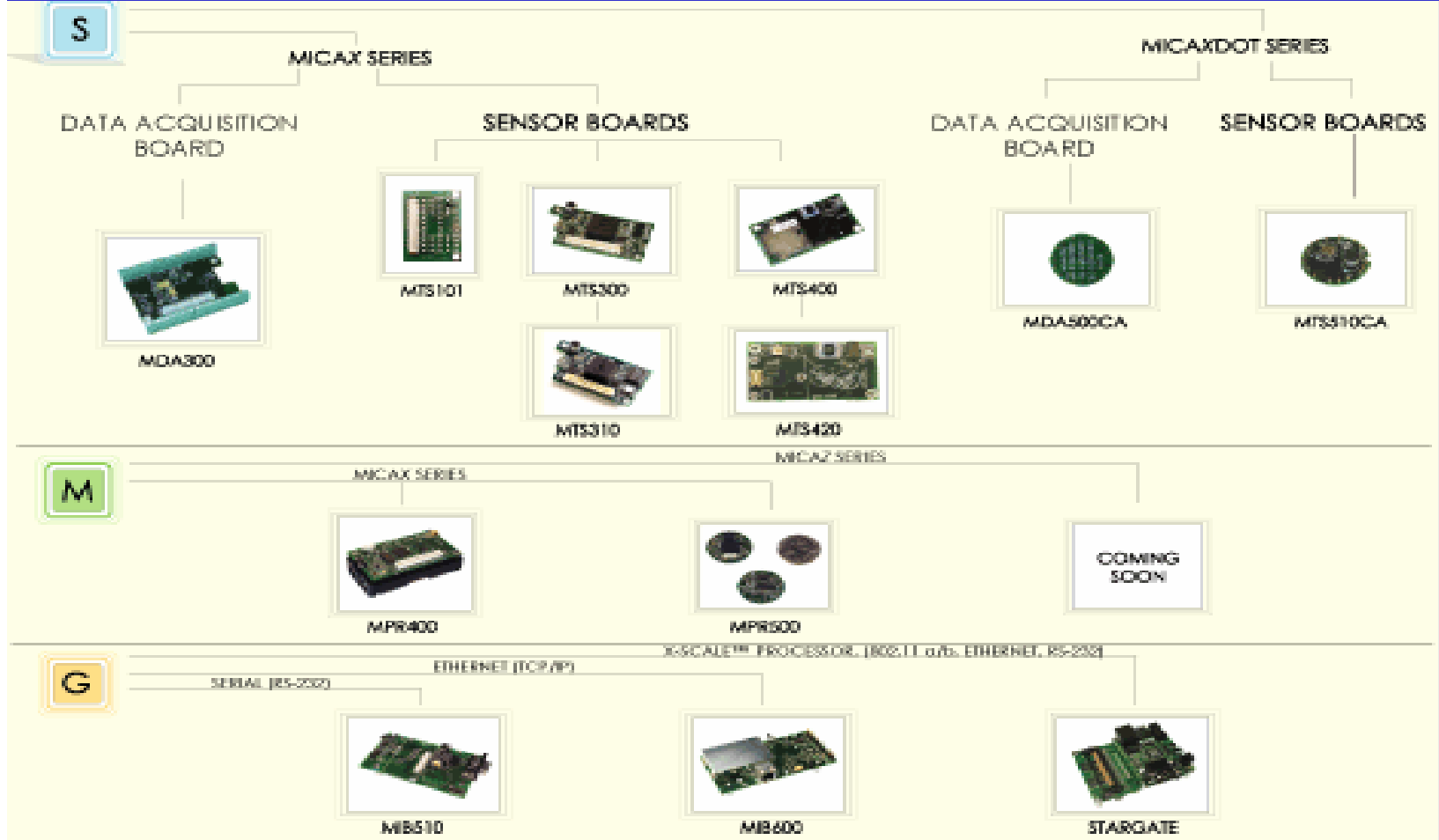
Source: OnWorld 2004

# Anywhere, Anytime Networking



- **Only True Mesh, No Wires**
- **Reliable & Range Extension**
- **Nodes can be mobile**
- **Nodes can enter & leave seamlessly**

# Crossbow's Plug-and-Play Solution



# TinyOS Software

- **Mote / Smart Dust Operating System**
- **Open-Source, Royalty-free—*De Facto Standard***
- **500 Active Organizations in Users-Group**
- **Multiple flows of data in real-time**
- **Highly modular**
- **Established at UC Berkeley as the operating system for Wireless Sensor Networks**

# It just makes sense..



**Before**



**After**

# Building Monitoring



**Before**



**After**

# Vibration Monitoring



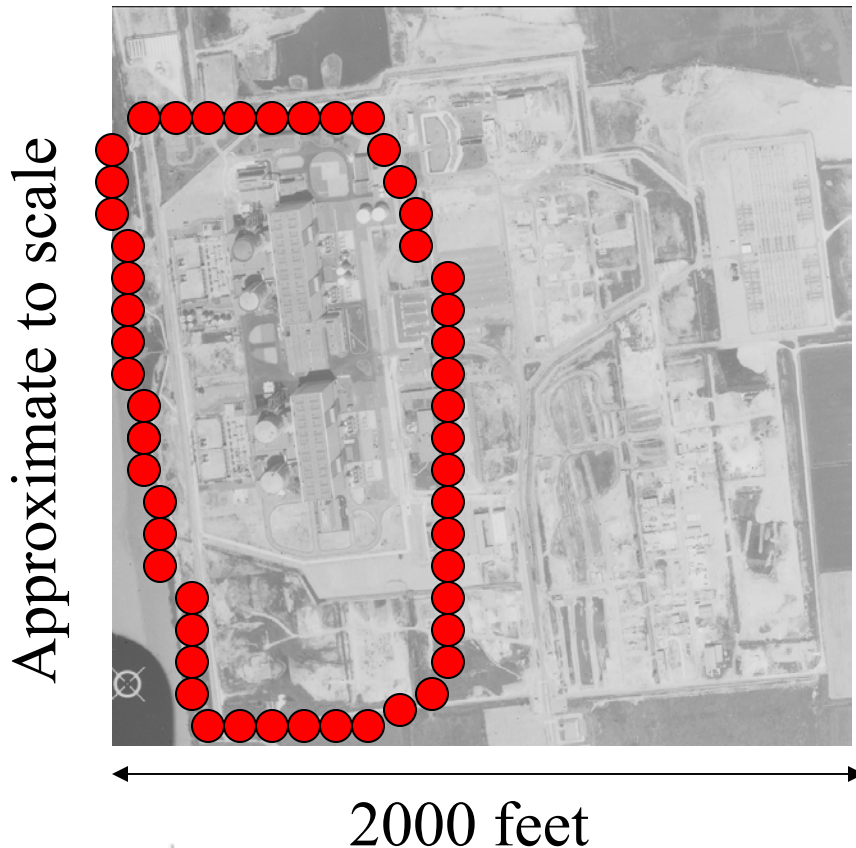
**Before**



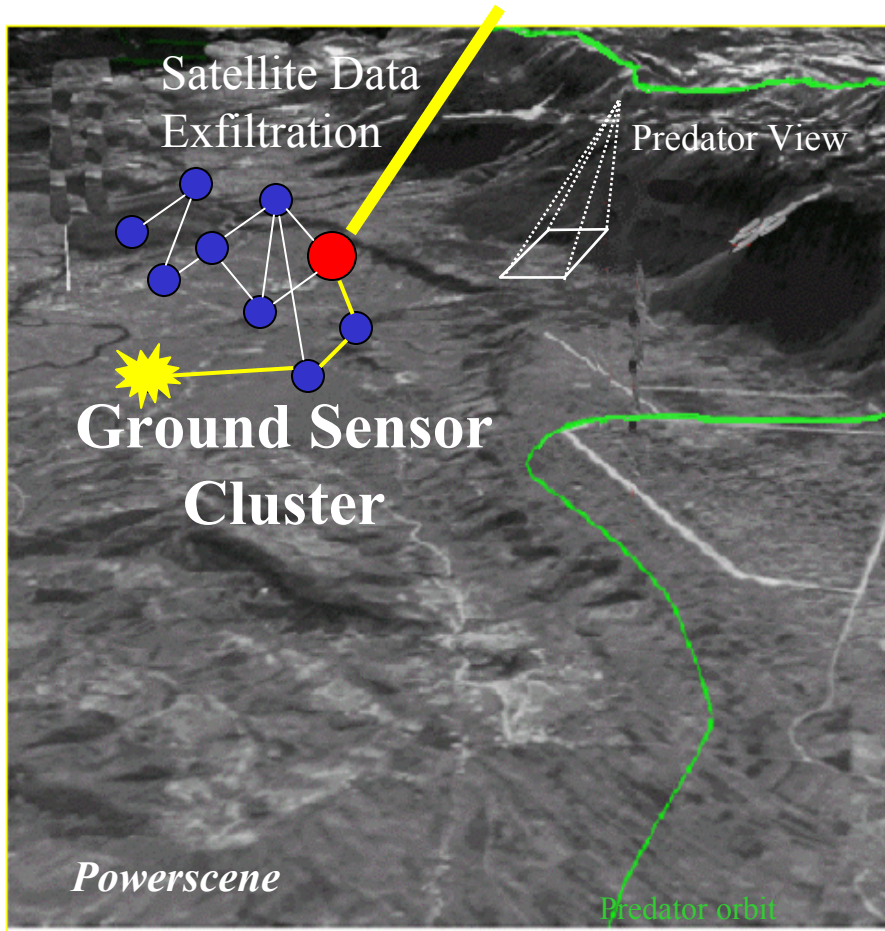
**After**

# Perimeter Security / Monitoring

- **Networked Ground Sensors**
  - Wide area 24/7 coverage
  - Mobile
- **50 sensors can cover physical area of plant**
- **Rapidly deployed to threat**
- **Sensor hit cues security action**



# Remote Surveillance



- **Networked Ground Sensors**
  - Wide area 24/7 coverage
- **Sensor Hit Cues Predator**
  - Personnel detected to 30m
- **GPS on each sensor**
- **Satellite Data Exfiltration**
  - Real time response