

# ***Motorola and MeshNetworks***

## ***Technology Update***

Sept 27, 2004

# WiFi / Broadband Technologies

Unlicensed/Enterprise



Unlicensed/Enterprise



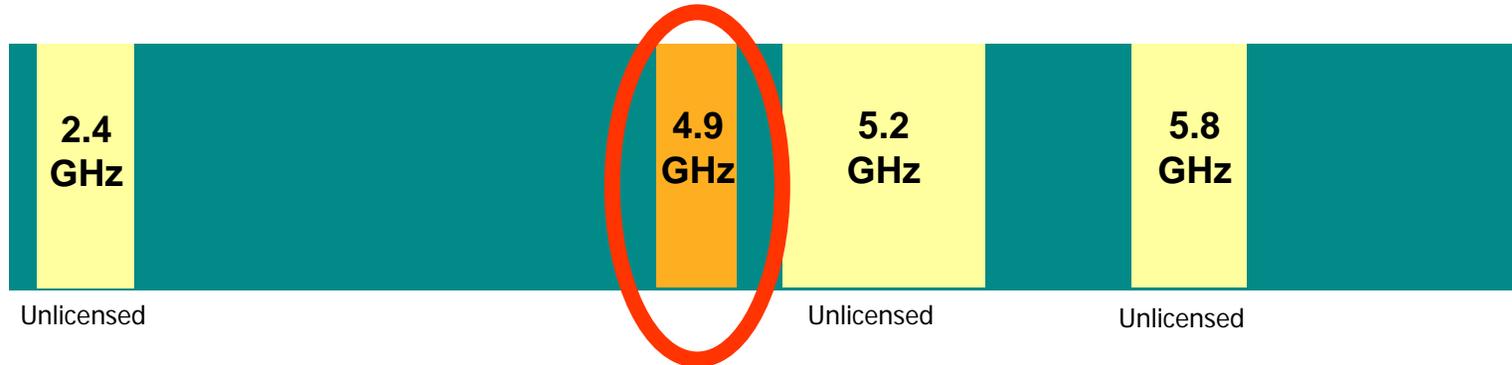
Home

2.4GHz

5.2GHz

5.8GHz

## 4.9 GHz Licensed Spectrum



- February, 2002:
  - FCC designates 50 MHz of spectrum at 4.9 GHz for broadband public safety use
  - Licensed Spectrum – Eliminate Interference

# WiFi / Broadband Technologies

Unlicensed/Enterprise



Licensed Broadband



Unlicensed/Enterprise



Home

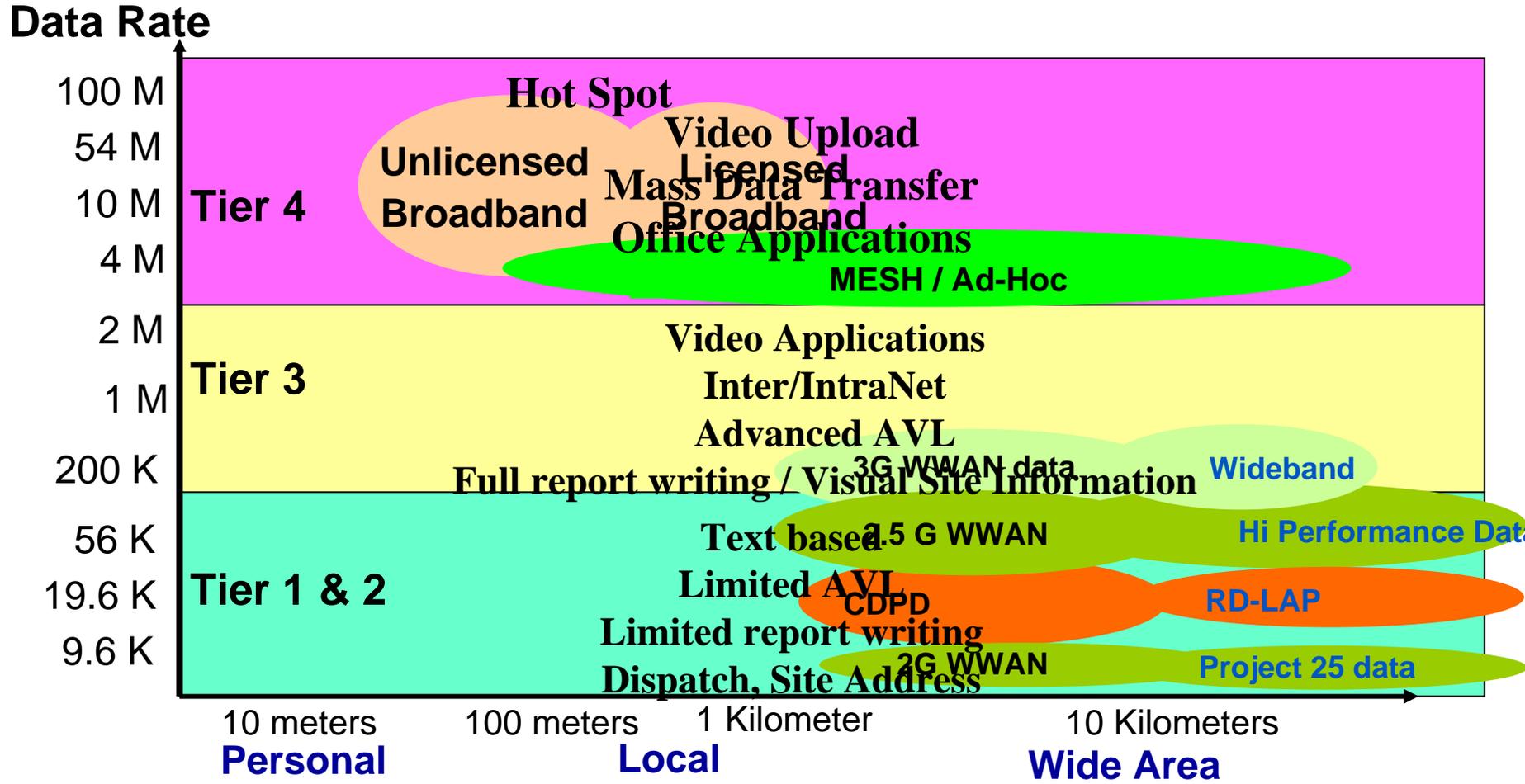
2.4GHz

4.9GHz  
Licensed

5.2GHz

5.8GHz

# Data Options



## Coverage

## ***Motorola and MeshNetworks have Joined Forces***

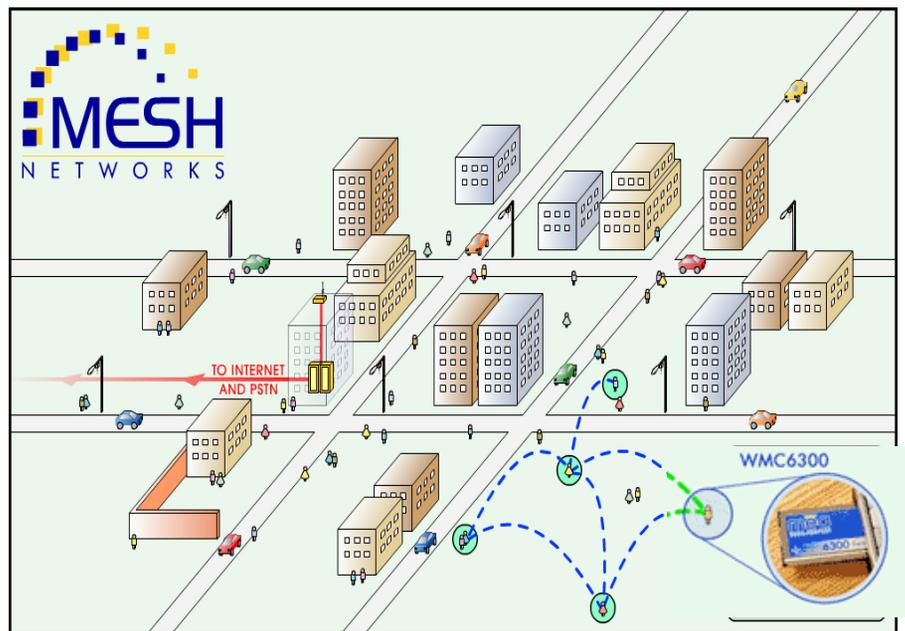
- **MeshNetworks offers Innovative Broadband Technology**
  - “Multi-hop” technology
  - “Self forming”, “self healing” network
  - “Ad-Hoc” mode supports connectivity between users in the absence of infrastructure
  - Full Mobility
    - 100 mph
  - Full Roaming
- **Motorola brings the “Complementary Assets”**
  - Product Development
  - Distribution
  - System Integration Expertise

# *What is “MESH” Technology?*

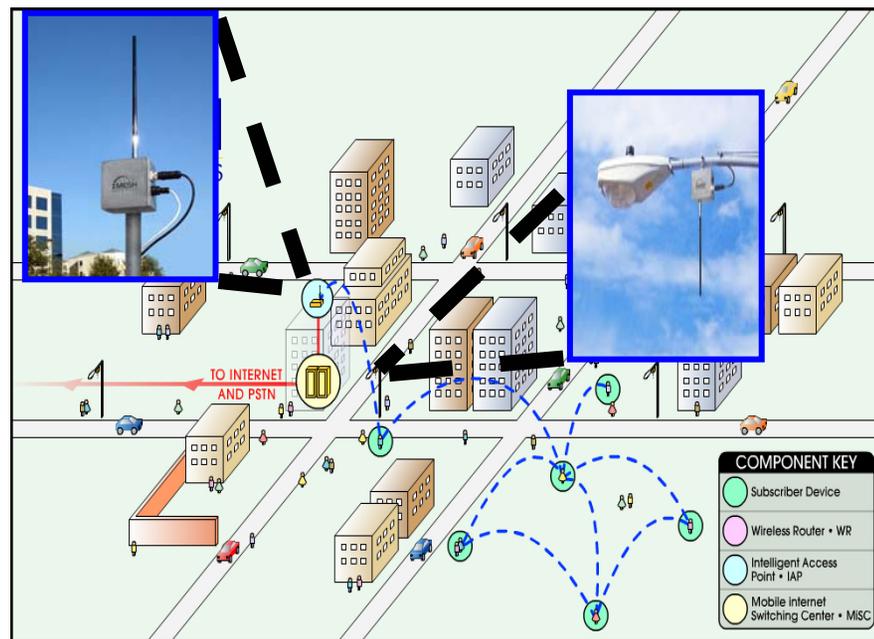
# Mesh-Type Networks / Peer to Peer / Ad-Hoc Technologies

- Two modes of operation
  - Multi-hop Ad-Hoc (without infrastructure)
    - WLAN (6Mbps peak rate)
  - Mobile Broadband Infrastructure using multi-hop routing

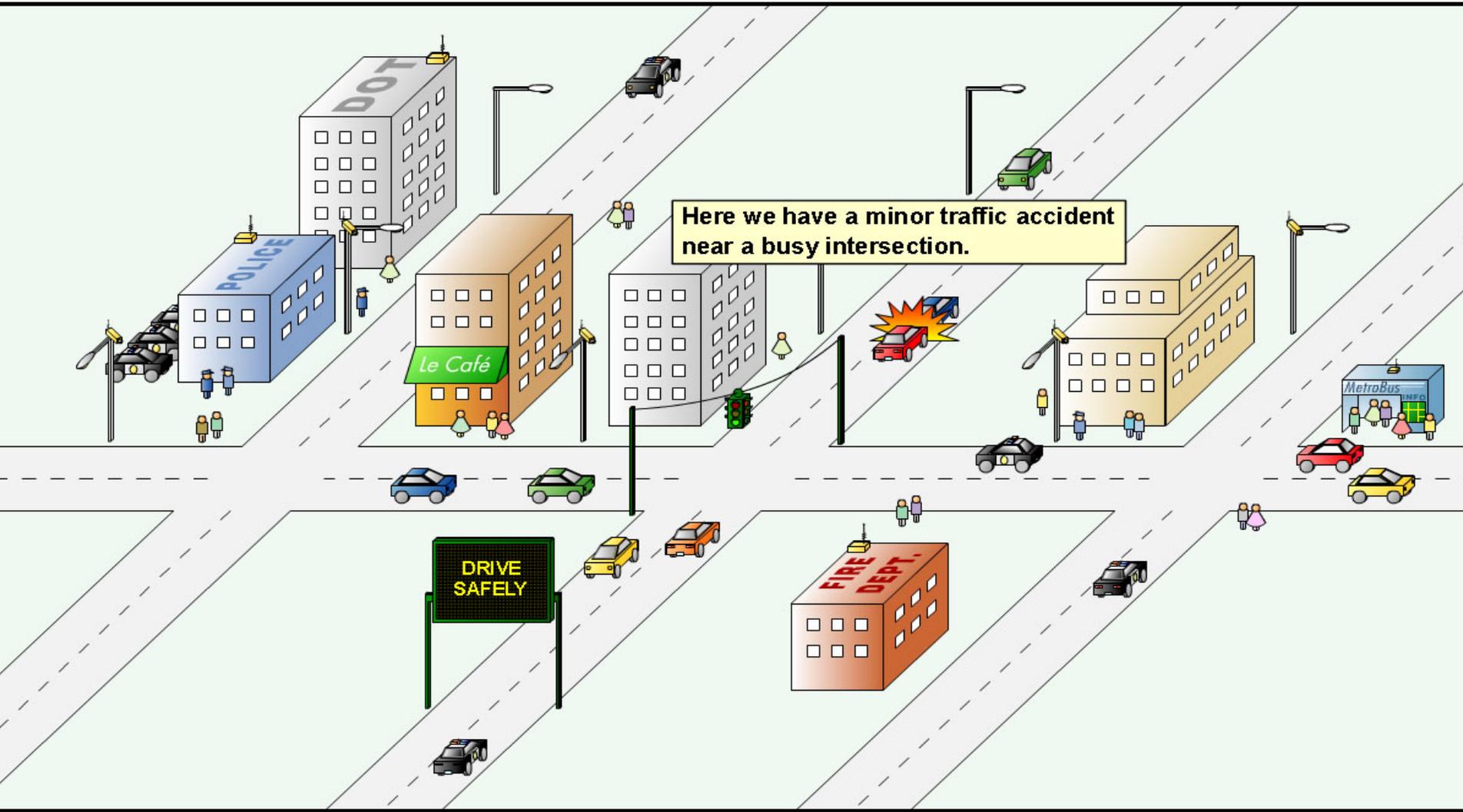
*Ad-Hoc Peer to Peer*



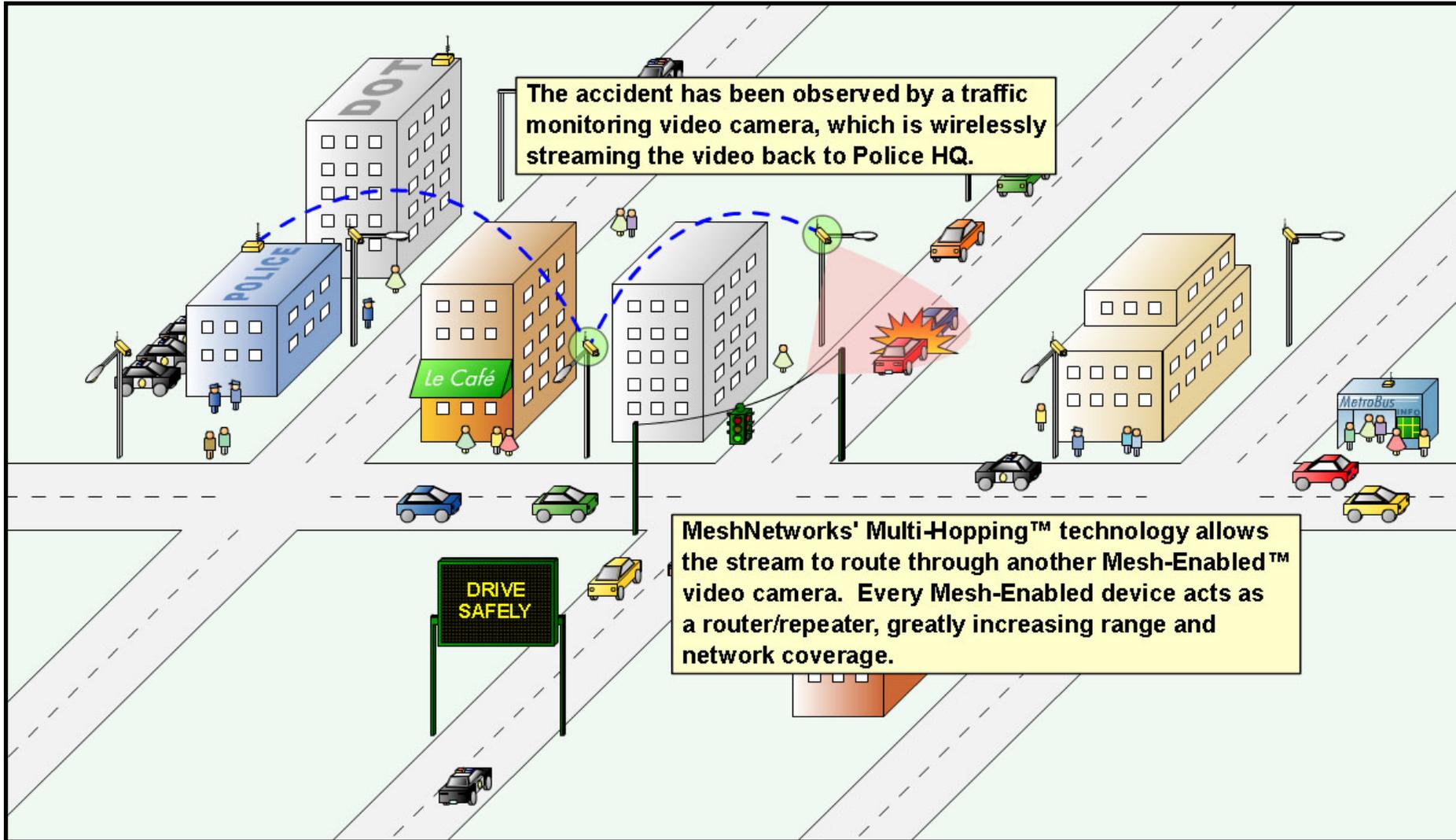
*Mobile Broadband Infrastructure*



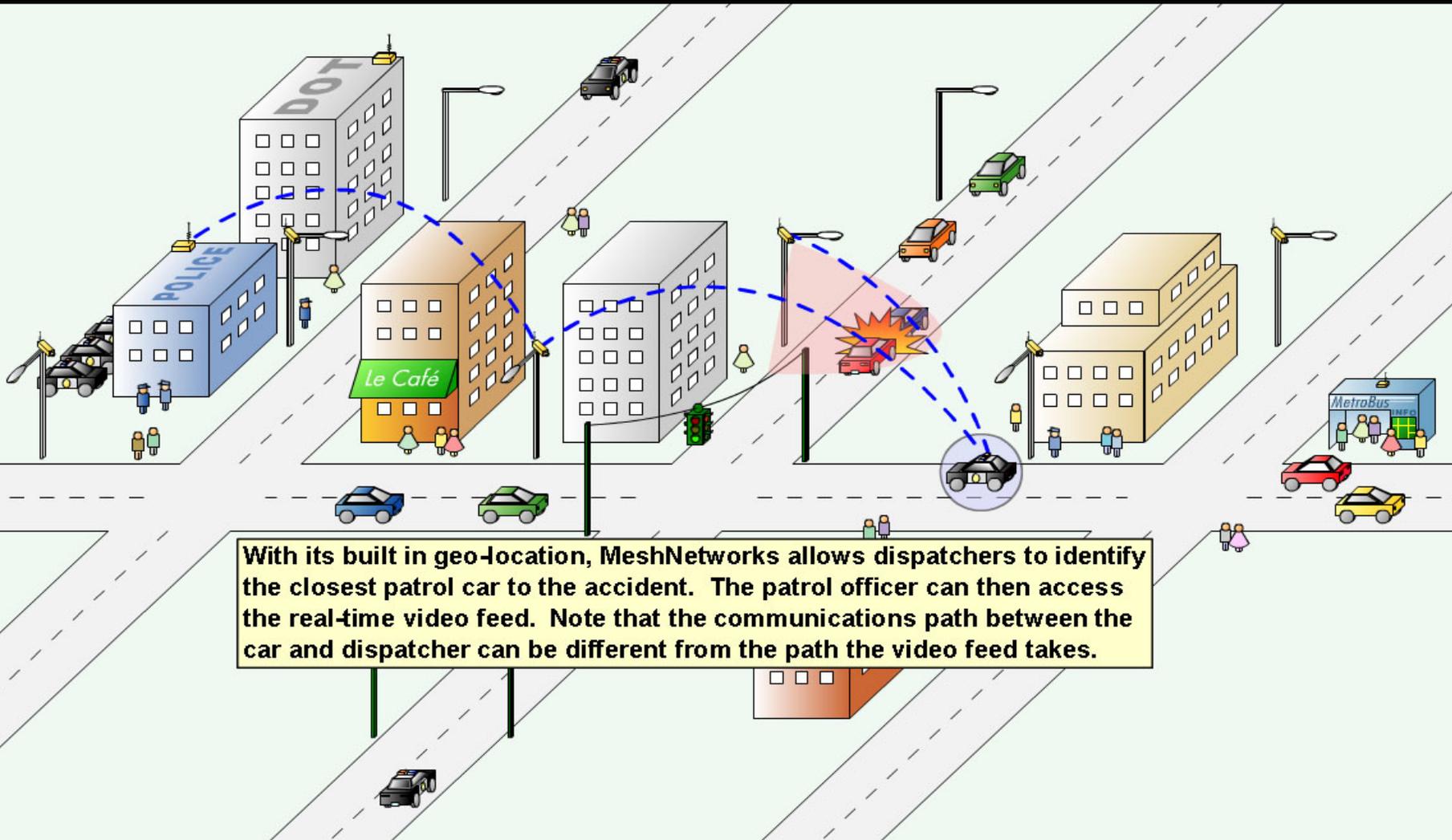
# Public Safety Example



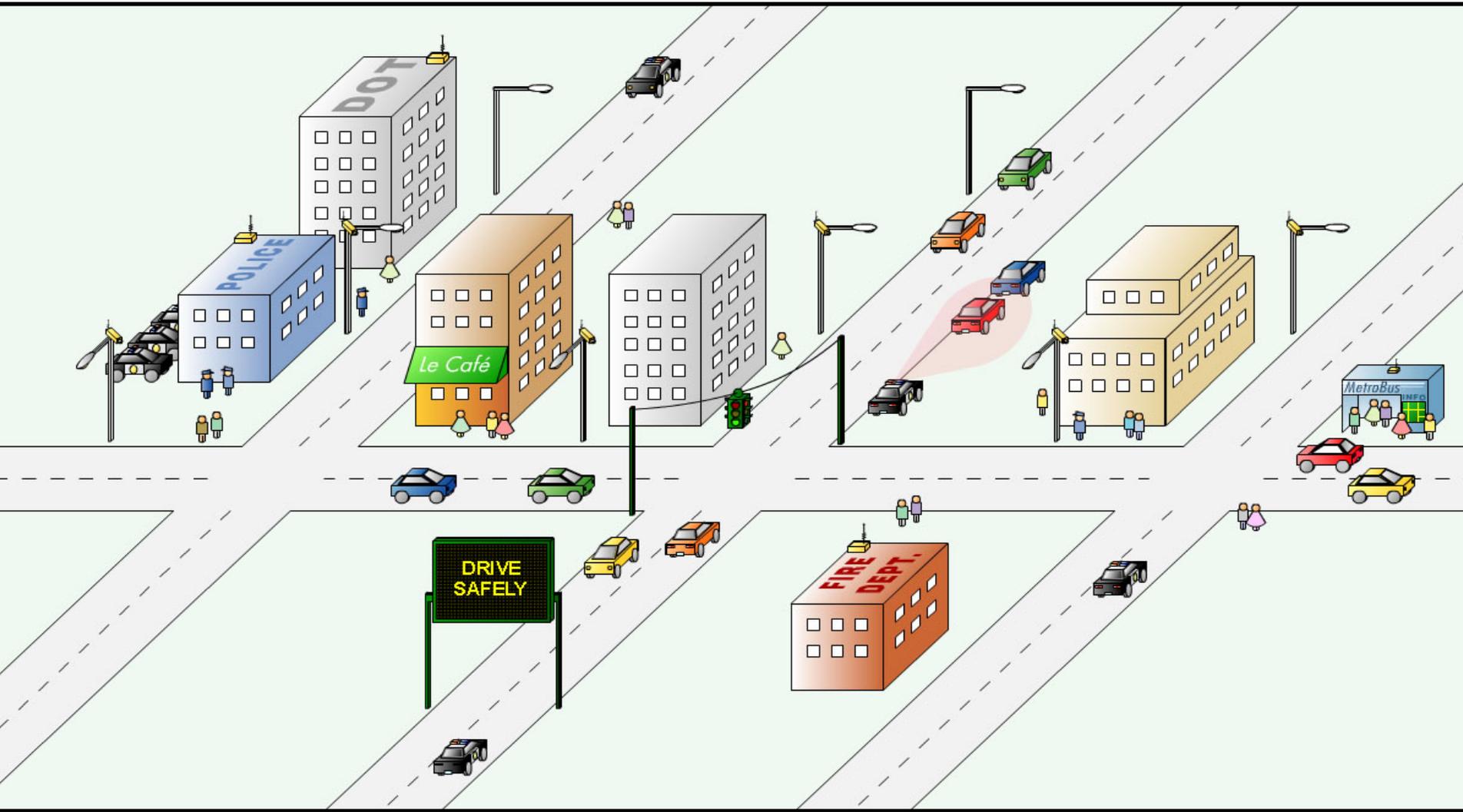
# Public Safety Example



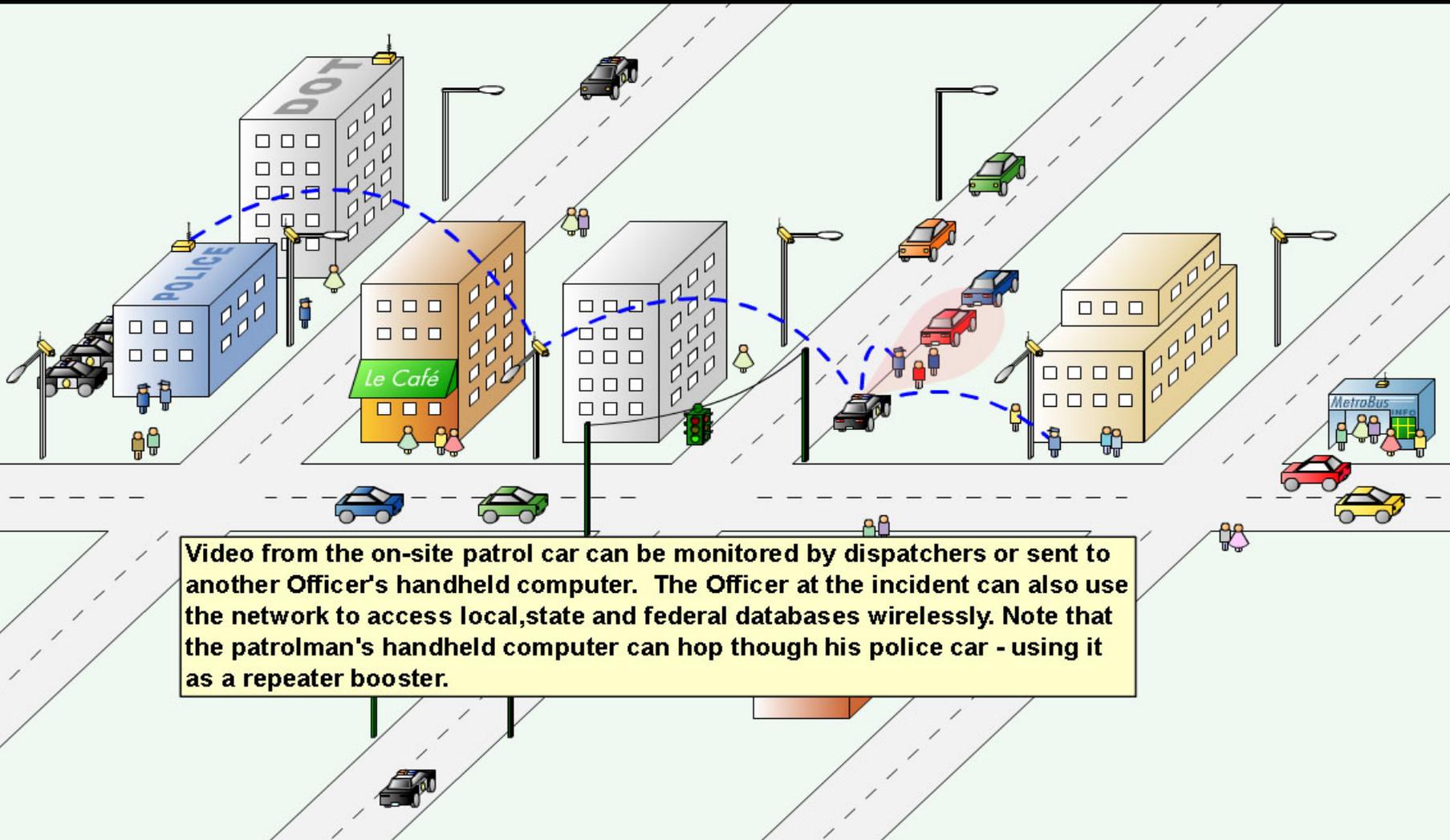
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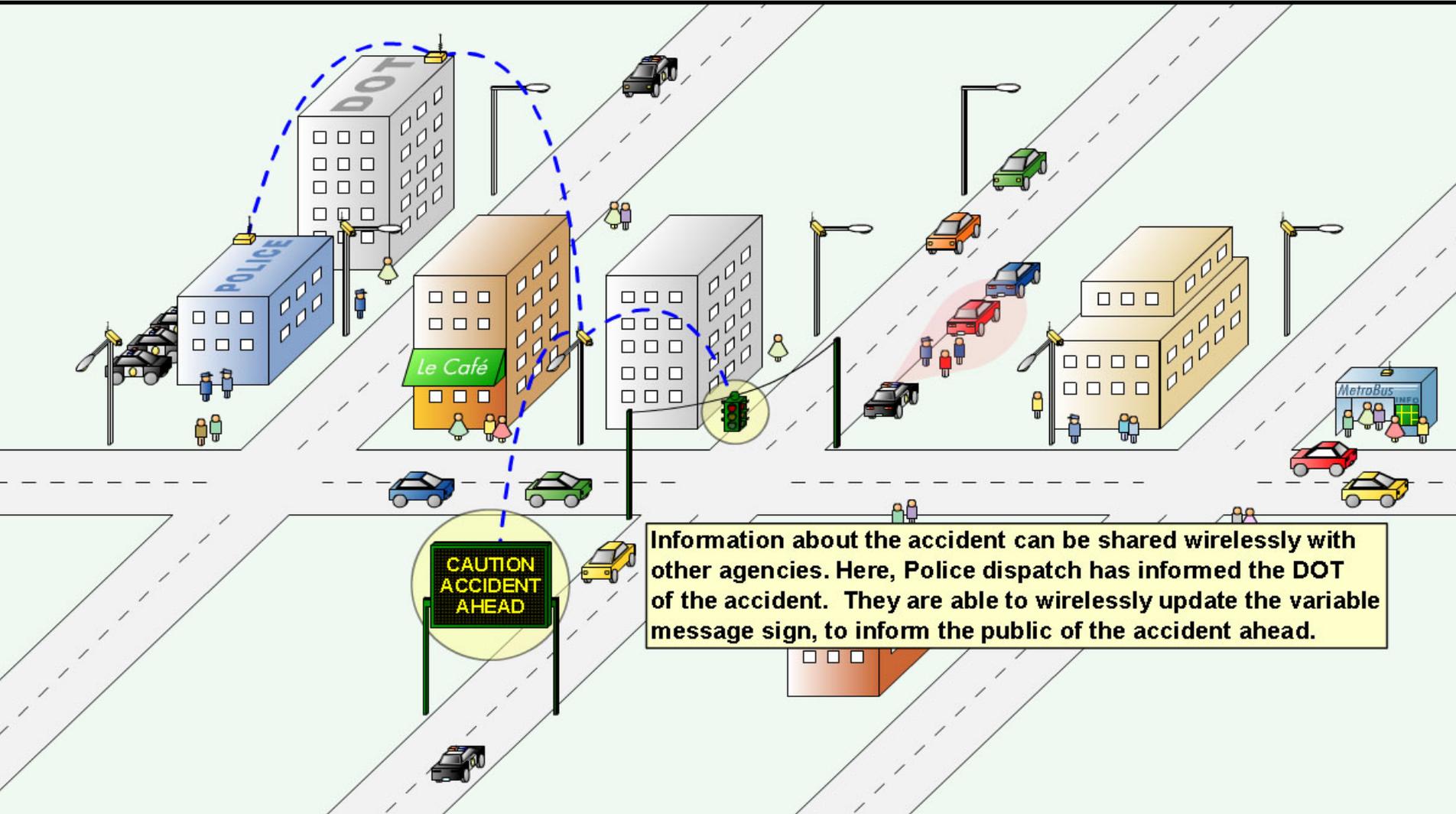
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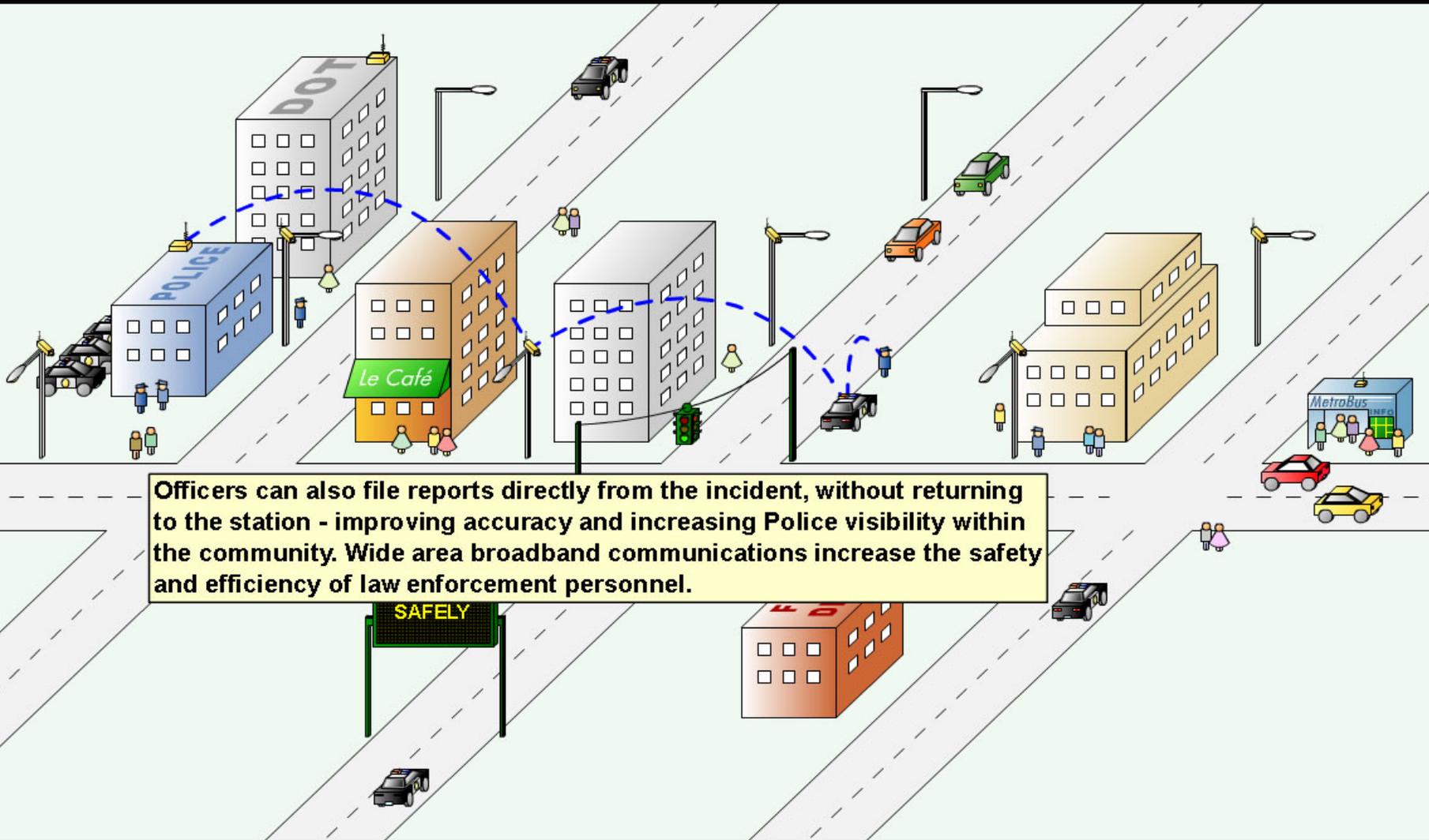
## Public Safety Example



# Public Safety Example

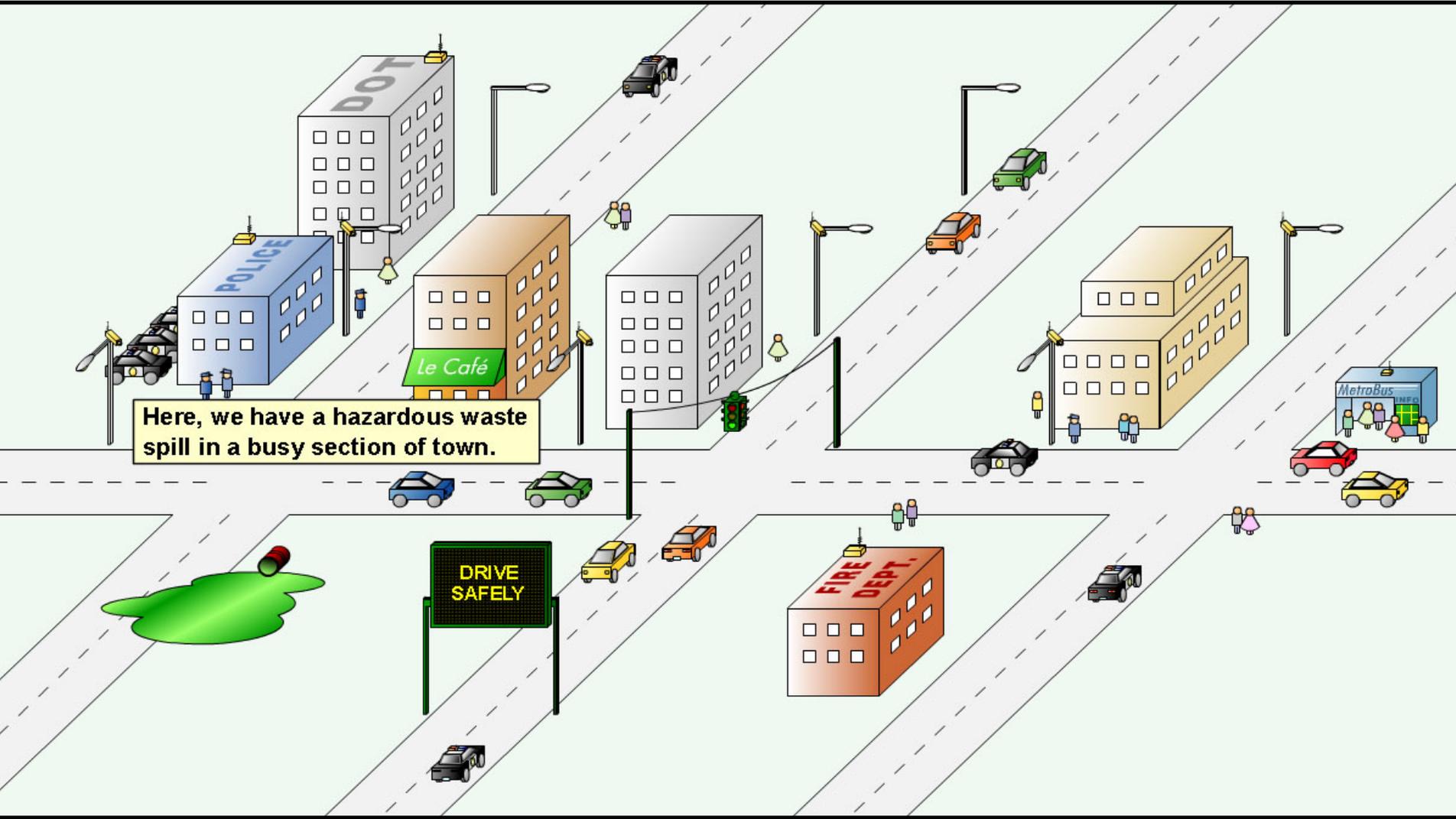


# Public Safety Example



**Officers can also file reports directly from the incident, without returning to the station - improving accuracy and increasing Police visibility within the community. Wide area broadband communications increase the safety and efficiency of law enforcement personnel.**

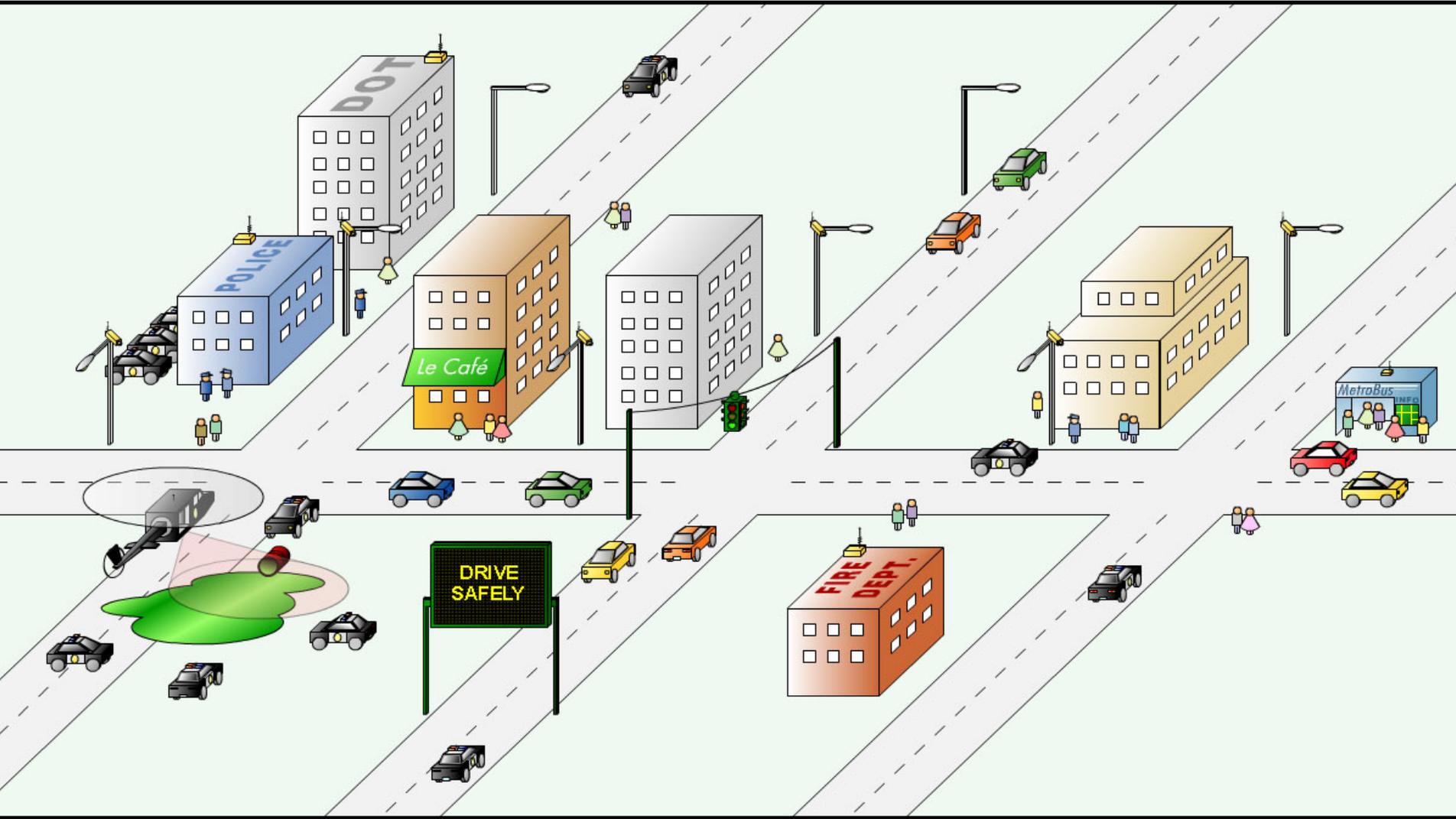
# Ad Hoc Example



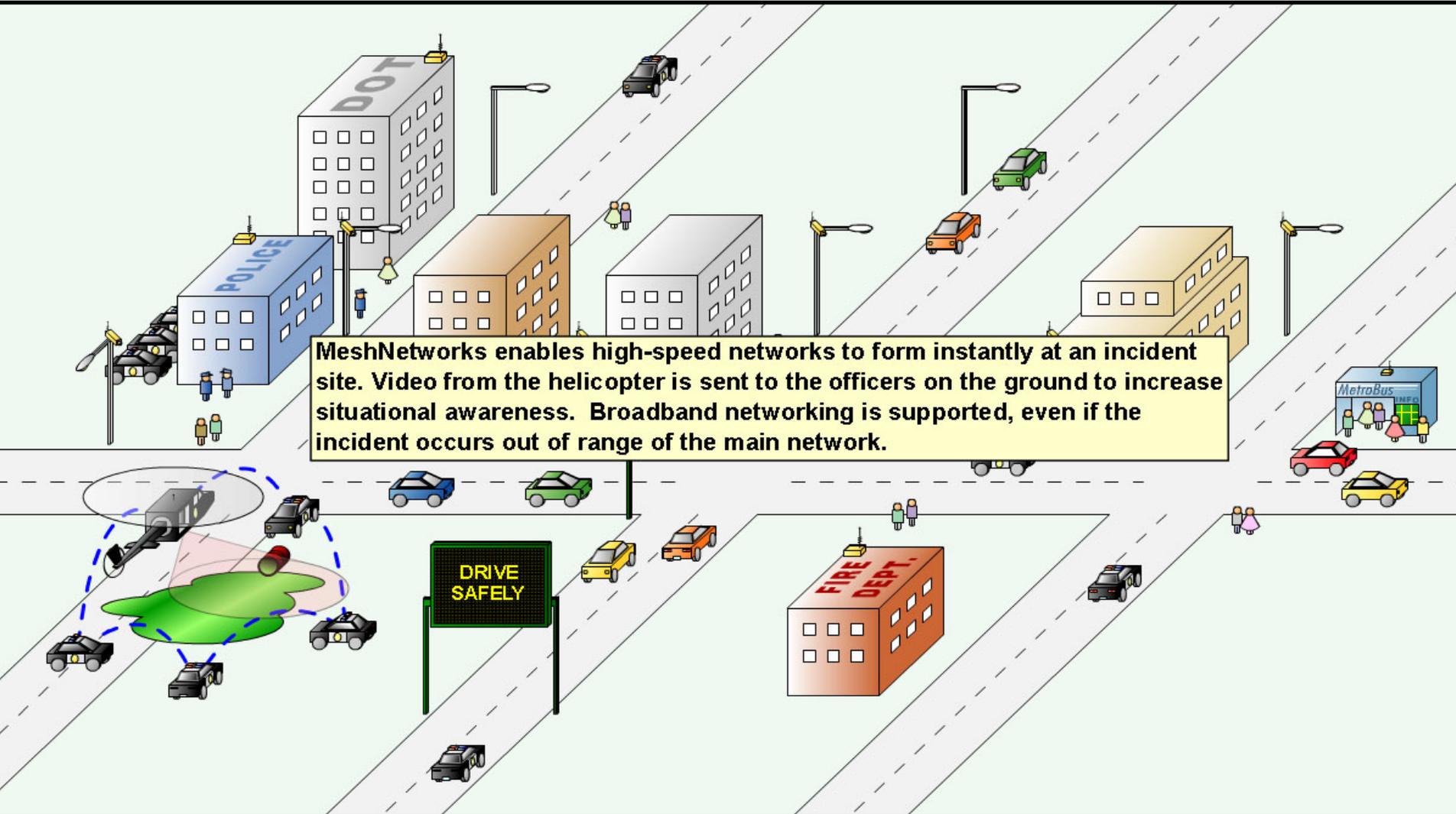
Here, we have a hazardous waste spill in a busy section of town.

DRIVE SAFELY

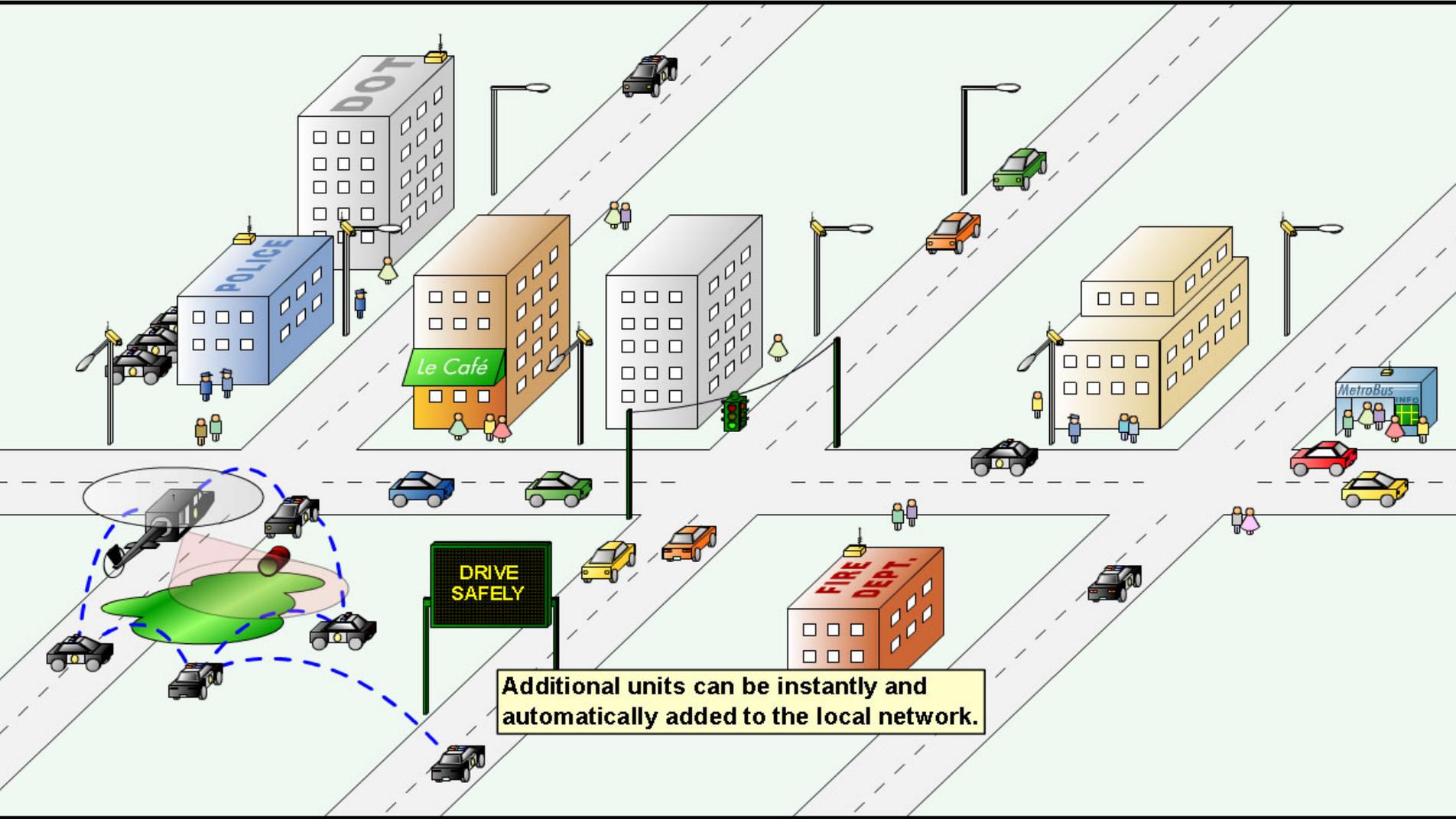
# Ad Hoc Example



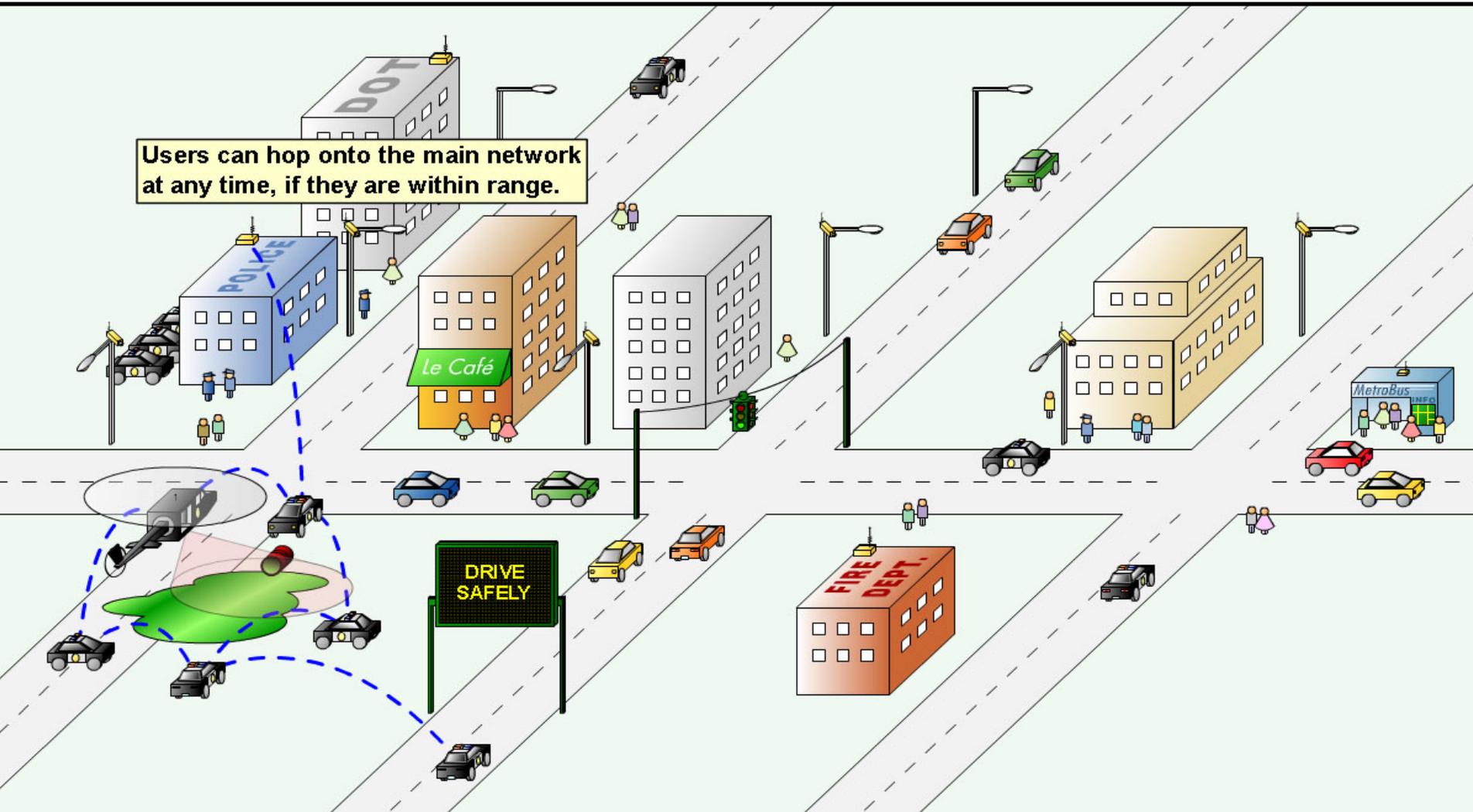
# Ad Hoc Example



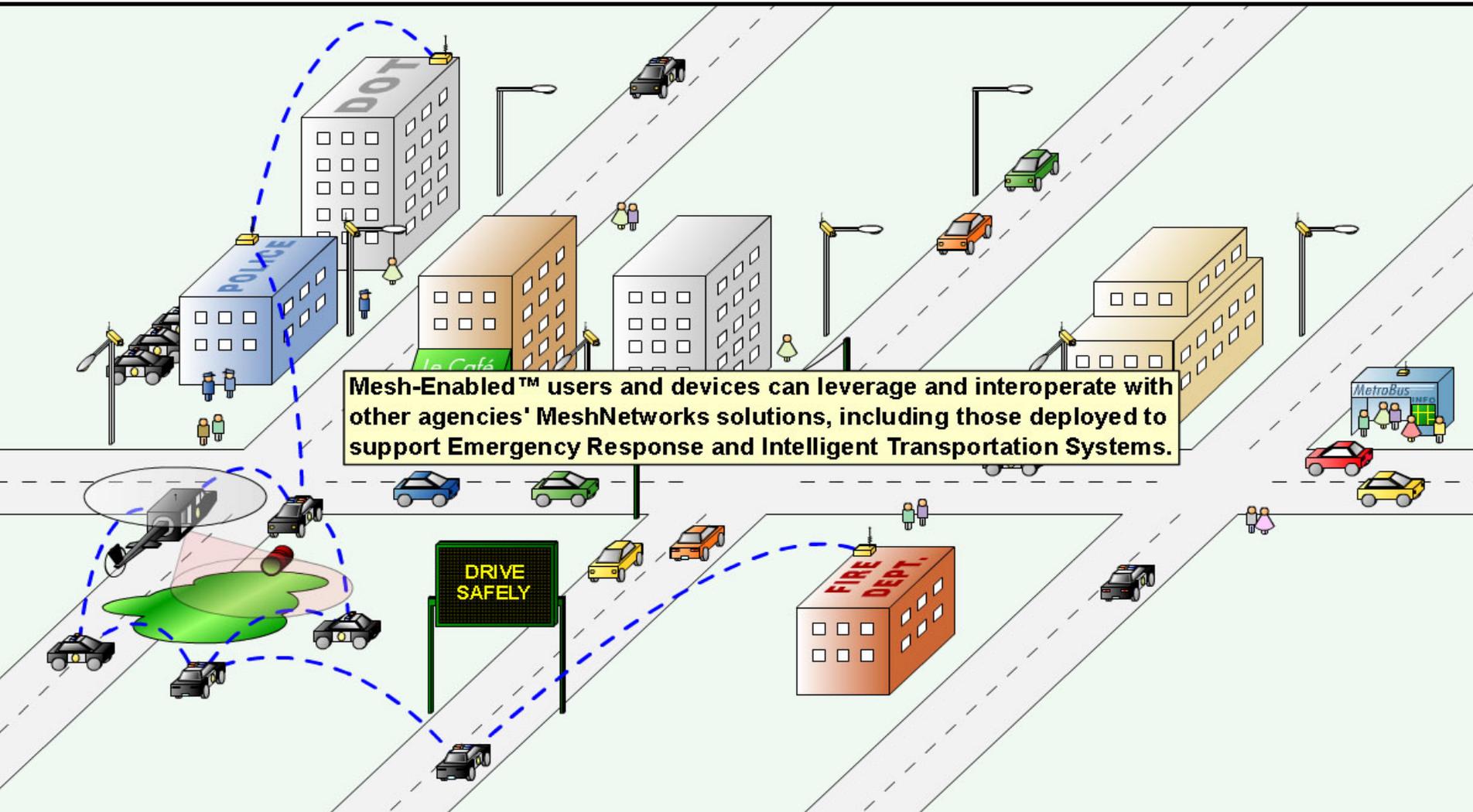
# Ad Hoc Example



# With Multi-Hop users become the network...



## Agency interoperability – effective coordination during emergencies



## Wireless Modem Card



- Forms ad hoc peer to peer networks
- Supports client and infrastructure meshing
- Device driver support
  - Windows® support
  - Pocket PC® 2002/2003
- Host interface
  - Type II PCMCIA
- Over The Air network management
- Up to 6 Mbps burst data rates
- 2.4 GHz initially
- 4.9 GHz in 2005
- 0.5 watts
- External 'whip' antenna for enhanced coverage (not required)

## ***Vehicular Mounted Modem***

- **Vehicle mounted**
  - **12VDC Powered**
  - **Remotely mounted antenna**
  - **Robust package**
  - **0.5 watts**
- **RJ45 Ethernet port**
  - **Supports up to 3 IP devices**
  - **Seamless handoff for all connected devices**



# *Intelligent Access Point (IAP)*

- Different “Site” than Today
- Wired Network Access
- Up to 6Mbps burst data rate per IAP
- Enhances network capacity
- Over The Air network management
- Position Location reference point
- NEMA 4 Enclosure
  - Antenna connector
  - RJ45 Data port
- 120vAC or 12vDC
- 5” x 5” size



# ***Wireless Access Point (WAP)***



- Ensures wireless coverage
  - Extension from IAP
- Automatic network balancing
- Over The Air network management
- Position Location reference point
- NEMA 4 Enclosure

# *Enhanced WAP*

- All Wireless router features
- RJ45 Ethernet Port (enhancement)
  - Supports up to 3 devices
    - Camera
    - Sensors
    - Etc.



# *More Capabilities*

- Network Management

# ***Network Management***

- **Solaris (Sun) Based**
- **Powerful Network & Subscriber Management**
- **Authentication & Authorization**
  - Supports standard IP VPNs
- **Over the Air (OTA) upgrades**
- **Network Interfaces**
  - 10/100Mbps Ethernet
  - Optional T1, E1 or DS3



# *More Capabilities*

- Network Management
- Security
  - Supports VPN
  - Proprietary Air Interface - No Listening Devices
- Coverage Enhancement
  - Breadcrumbs
- Future Enhancement
  - Location Information
    - Via Users
    - Via Breadcrumbs
    - Via IAP's / WAP's

# ***MESH Capabilities***

- Ad-Hoc Communications
- Self Forming / Self Healing / Multi-hop
- Mobility
- Roaming (Site Handoff)
- System Management
- Location Information
- Coverage Extension

***Thank You!***

***Any Questions?***