Cisco 3200 Series Wireless & Mobile Router

Mobile Network Solutions for Mass Transit

Contents

- Communication Challenges in Mass Transit
- Mass Transit Business Drivers, Trends & Goals
- Vision for Mass Transit Communications
- Cisco Mobile Network Solutions
- Solution Benefits

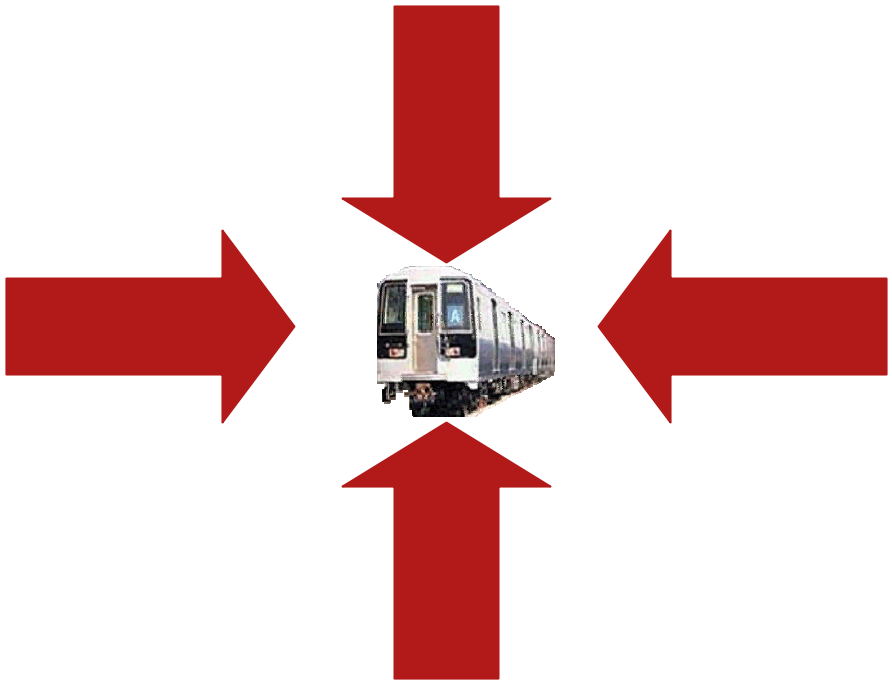
Challenges For Transit Agencies

- Train delays & congested passenger flow
- Disconnected standalone information and communications systems
- Limited access to critical information in real time
- Limited ability to communicate between transit vehicles, stations, and emergency personnel
- Inflexible resource allocation
- Difficulty integrating new security and emergency response measures

Key Drivers

Improve
operational efficiency

Improve
customer
service

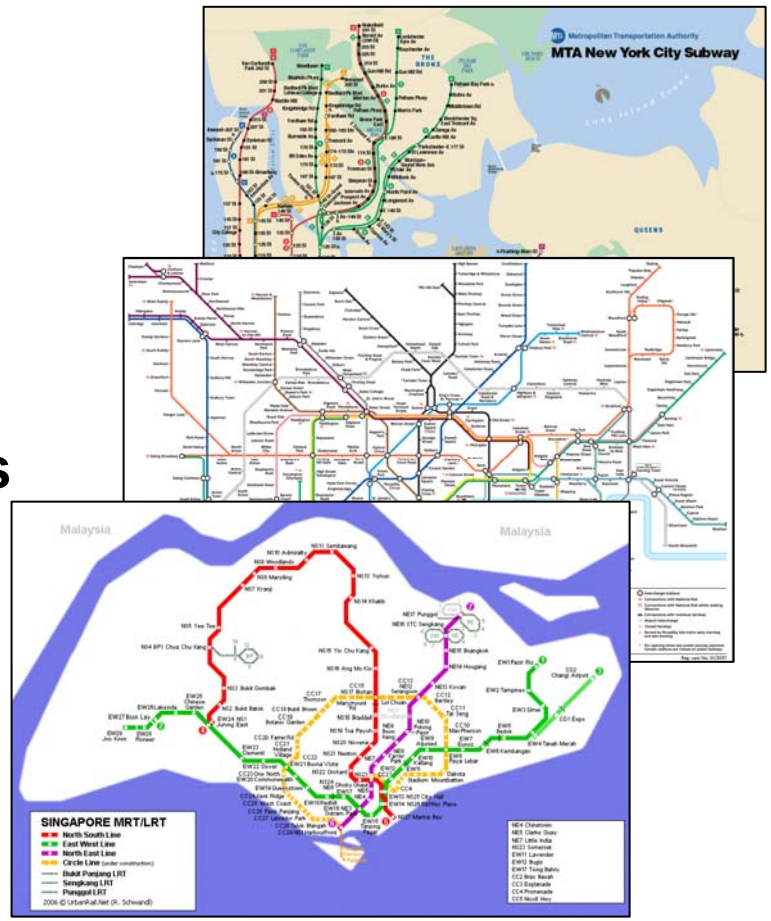


Enhance
security &
safety

Legislation / compliance

New Goals in Mass Transit Systems

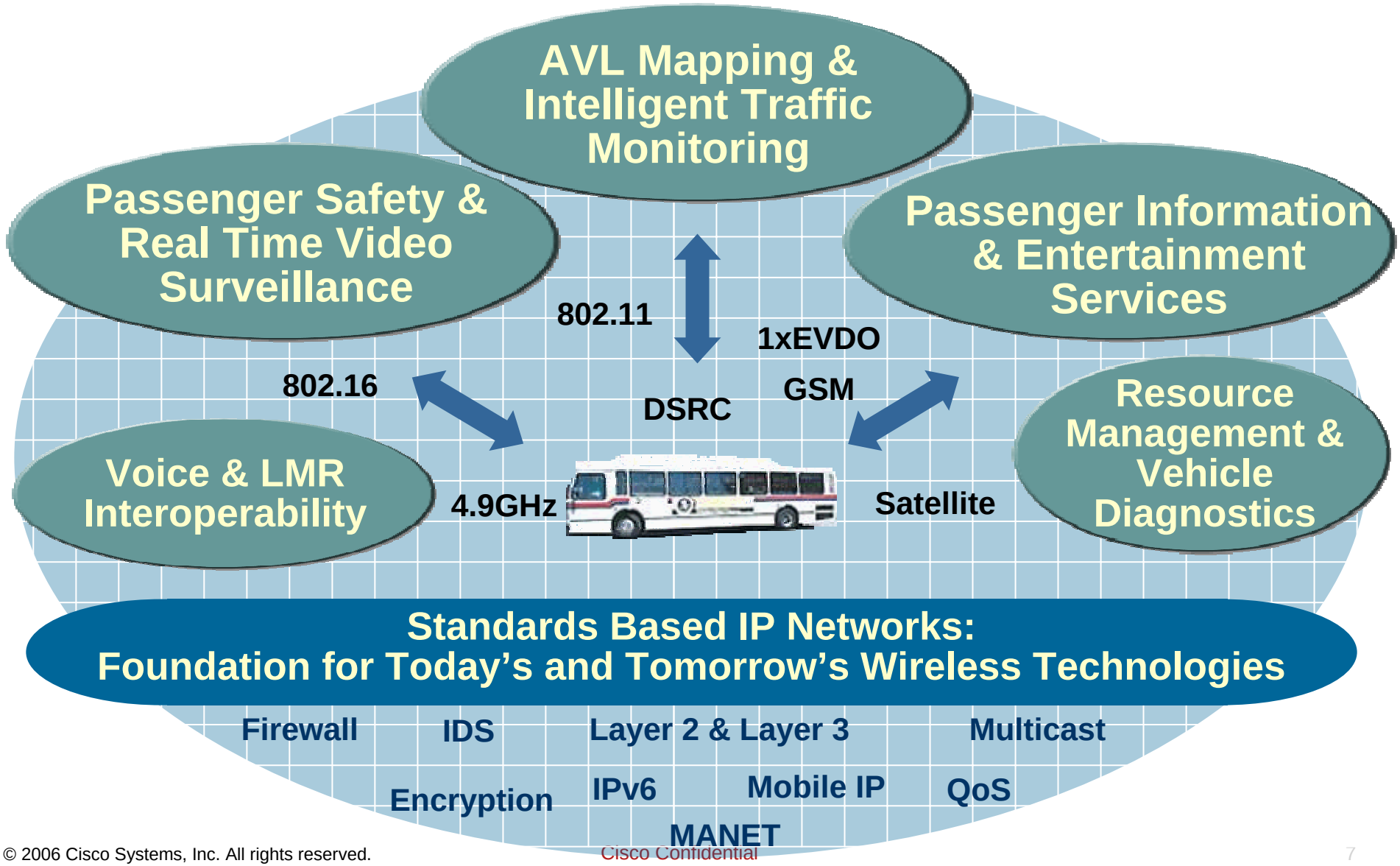
- Improve system efficiency for increased customer satisfaction
- Increase physical safety through networked applications
- Reduce costs associated with legacy applications
- Increase passenger ridership through new or improved services
- Improve communications between related city agencies
- Build a communications foundation that adapts to new applications and technologies



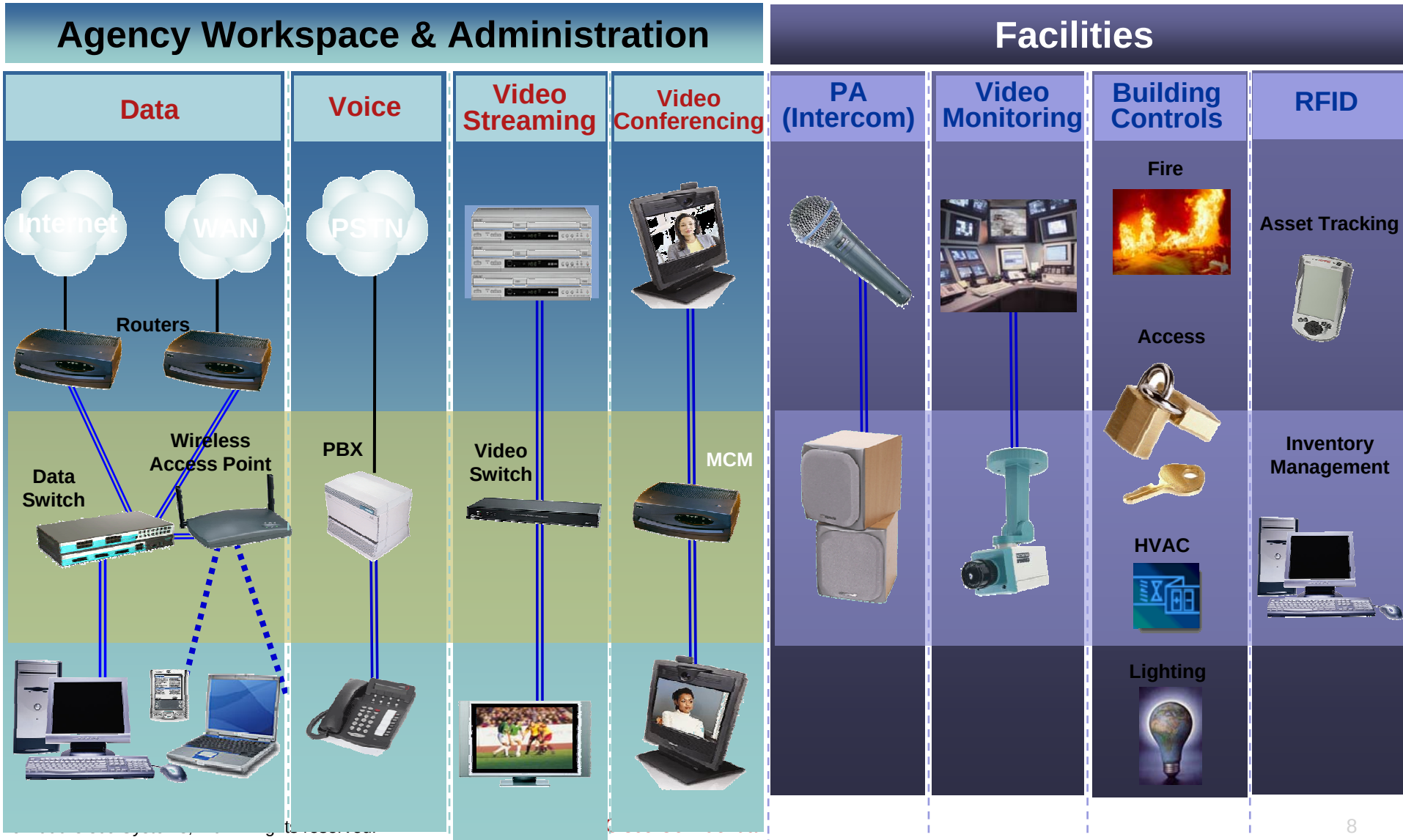
Communication Network Trends …..Extending the IP Network edge

- Network-based applications are increasingly important to transit operations
  - More profitable, faster, safer operations is the goal
- Advances in Wireless technologies
  - Increased reliability, lower prices, better coverage
  - 802.11a/b/g, UMTS, GPRS, CDMA, WiMAX, Satellite
- Increased demand for Mobile Networking
  - Real time access to information, increased productivity and lower costs, increased safety

A Vision for Network Centric Mobility for Mass Transit Systems

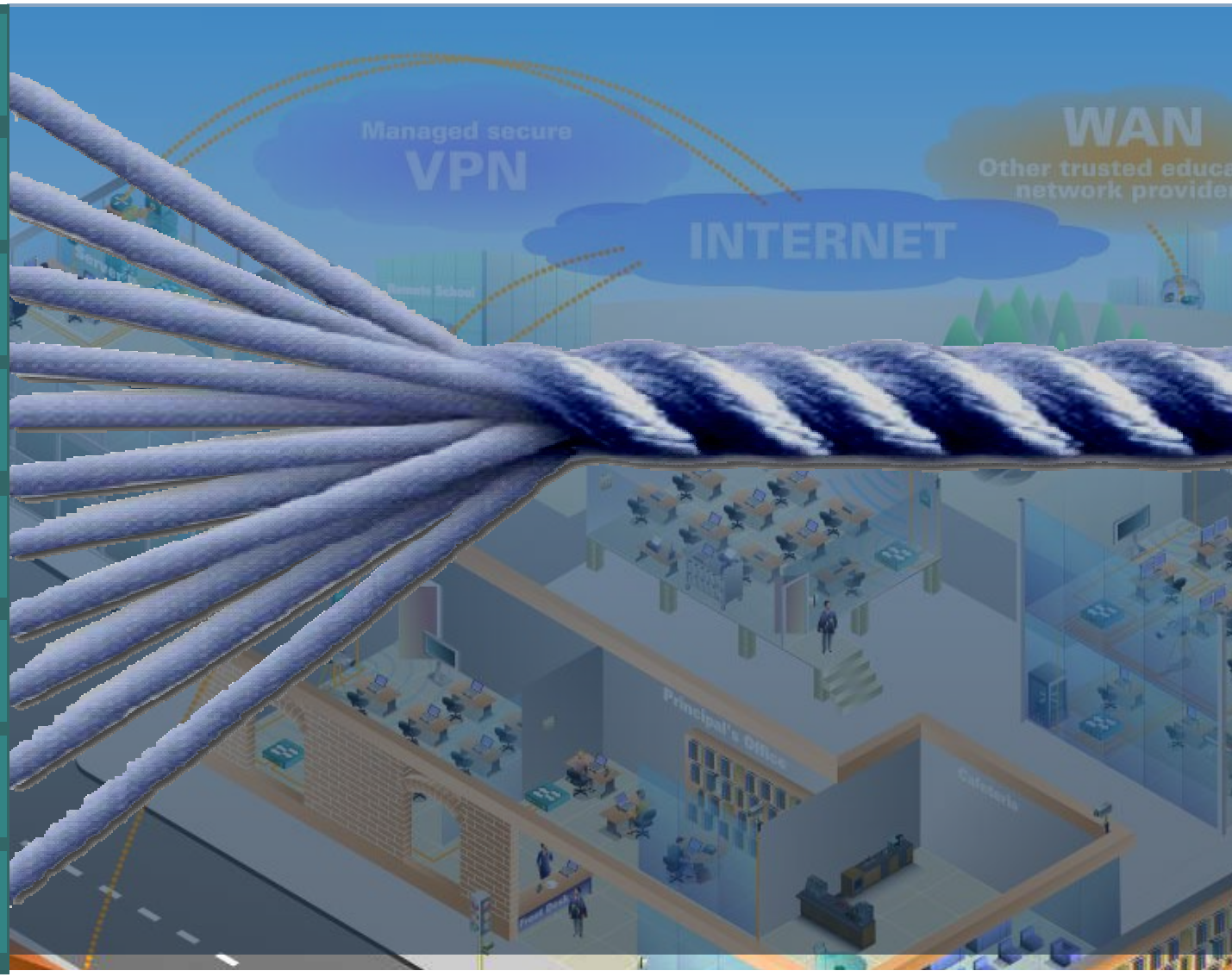


Mass Transit Communications Moving From Multiple Networks…



…To a Converged Network

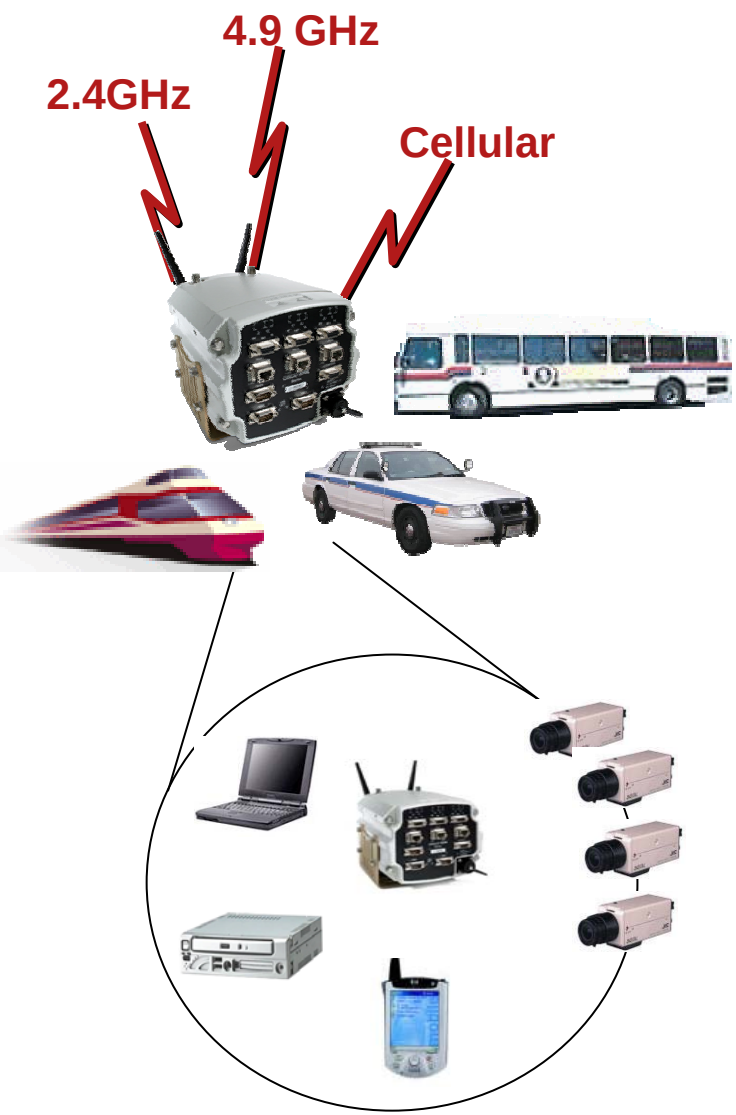
- Data
- Voice
- Video Streaming
- Video Conferencing
- PA (Intercom)
- Video Monitoring
- Building Controls
- RFID



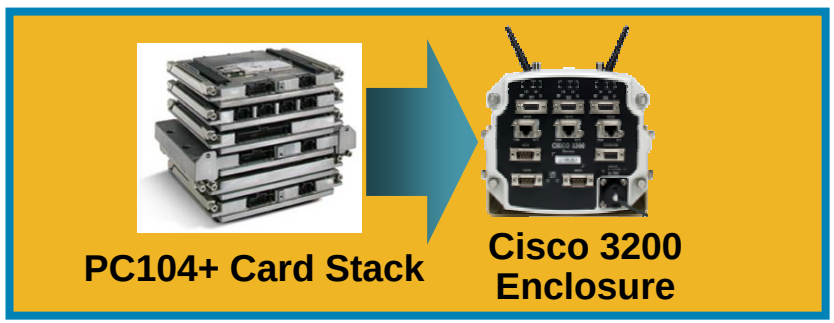
What Can an Integrated Network Provide?

- **Scalability & integrated management**
- **Fixed and mobile network connectivity**
- **Interoperability & integration between individual networks applications**
- **Pervasive network security**
- **Use of wireless technologies**
- **Network foundation for future technologies & applications**

Cisco 3200 Series Router Enabling Real Time Mobile & Wireless Communications



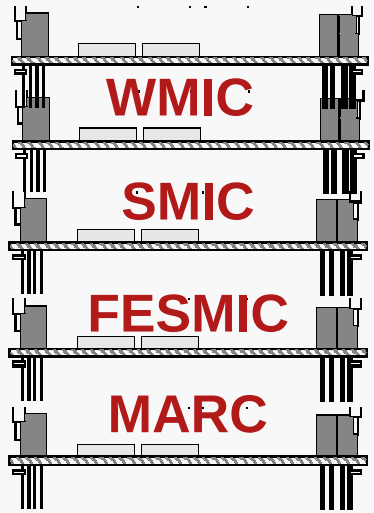
- Flexible, high performance & rugged design for mobile & embedded applications
- Integrated 802.11b/g, 4.9GHz, 5GHz, 3rd party Cellular
- Secure, scalable, and managed data, voice and video communications
- Seamless mobility across wireless networks
- Advanced IP services and interoperability through Cisco IOS Software
- Integrated 3rd Party Hardware & Software Options



Cisco 3200 Series Hardware Overview

- Mobile Access Router Cards (MARC)
  - –3230 MARC: (1) 10/100 FE, 1 Console, Aux port
  - –3270 MARC: (2) 10/100 FE, 1 GE Copper, 1 GE or Fiber, 2 USB
- Mobile Interface Cards (MICs)
  - –Serial Mobile Interface Card (SMIC): 2 or 4 port sync/async serial
  - –Fast Ethernet Switch Mobile Interface Card (FESMIC): 2 or 4 port FE/E Switch Card
  - –Wireless Mobile Interface Cards (WMIC): 802.11b/g, 4.9, 5GHz
- 3rd party Mobile Interface Cards
  - –Wireless Modems 1xRTT, EVDO, Edge
  - –Video Encoder Card
  - –Linux Blade with Hard Disk Drive

3rd Party MICs



Wireless Support for the Cisco 3200 Series

Integrated Wireless Radios/Modems or External Radios/Modems

Cisco Integrated 802.11a/b/g Wireless Cards

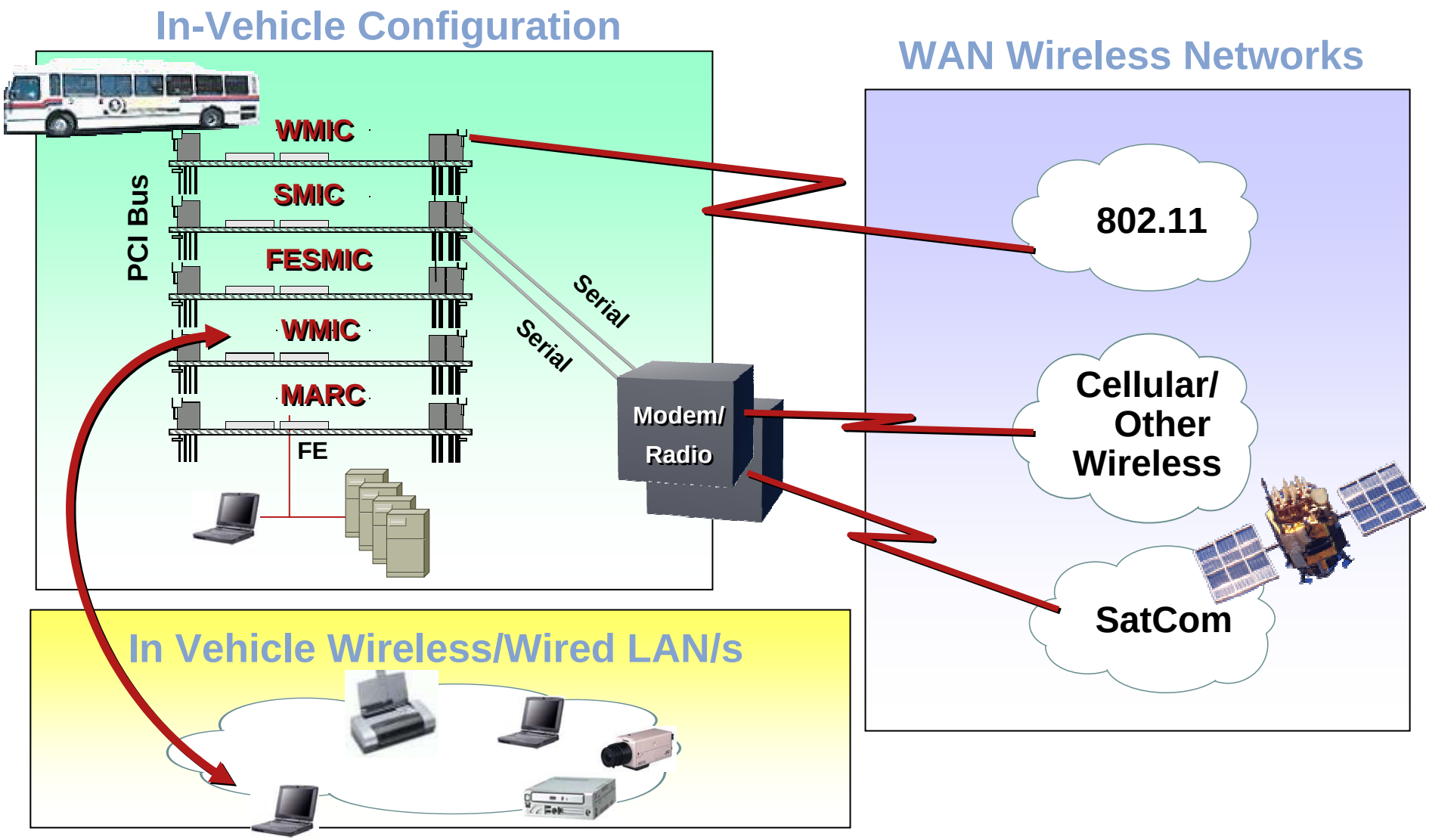
Cisco Integrated 4.9GHz Bridge or AP

Third Party Internal Modem (1xRTT, GPRS, EvDO, other)

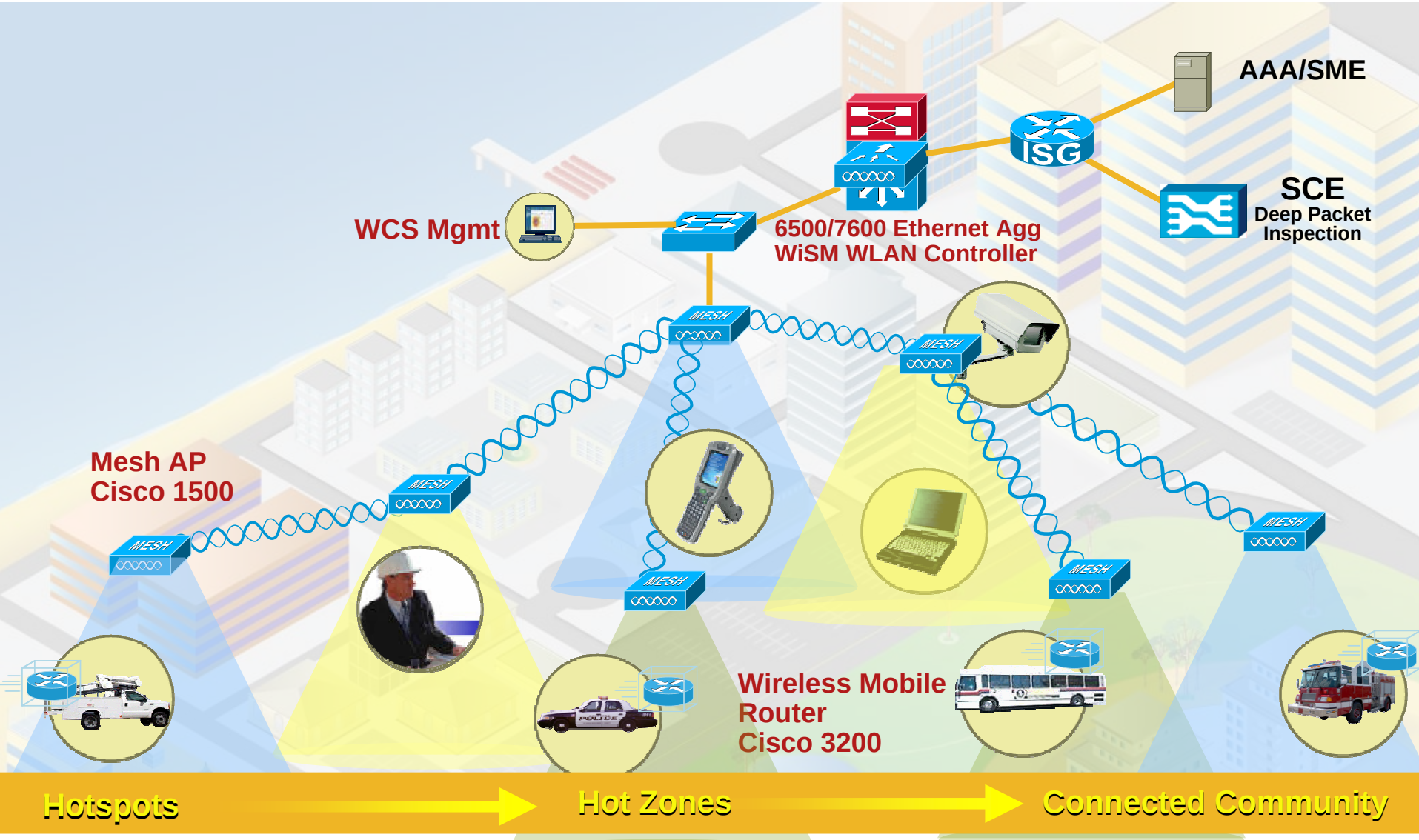
Future Wireless Technologies

External 3G Modems CDMA, HSDPA, EDGE

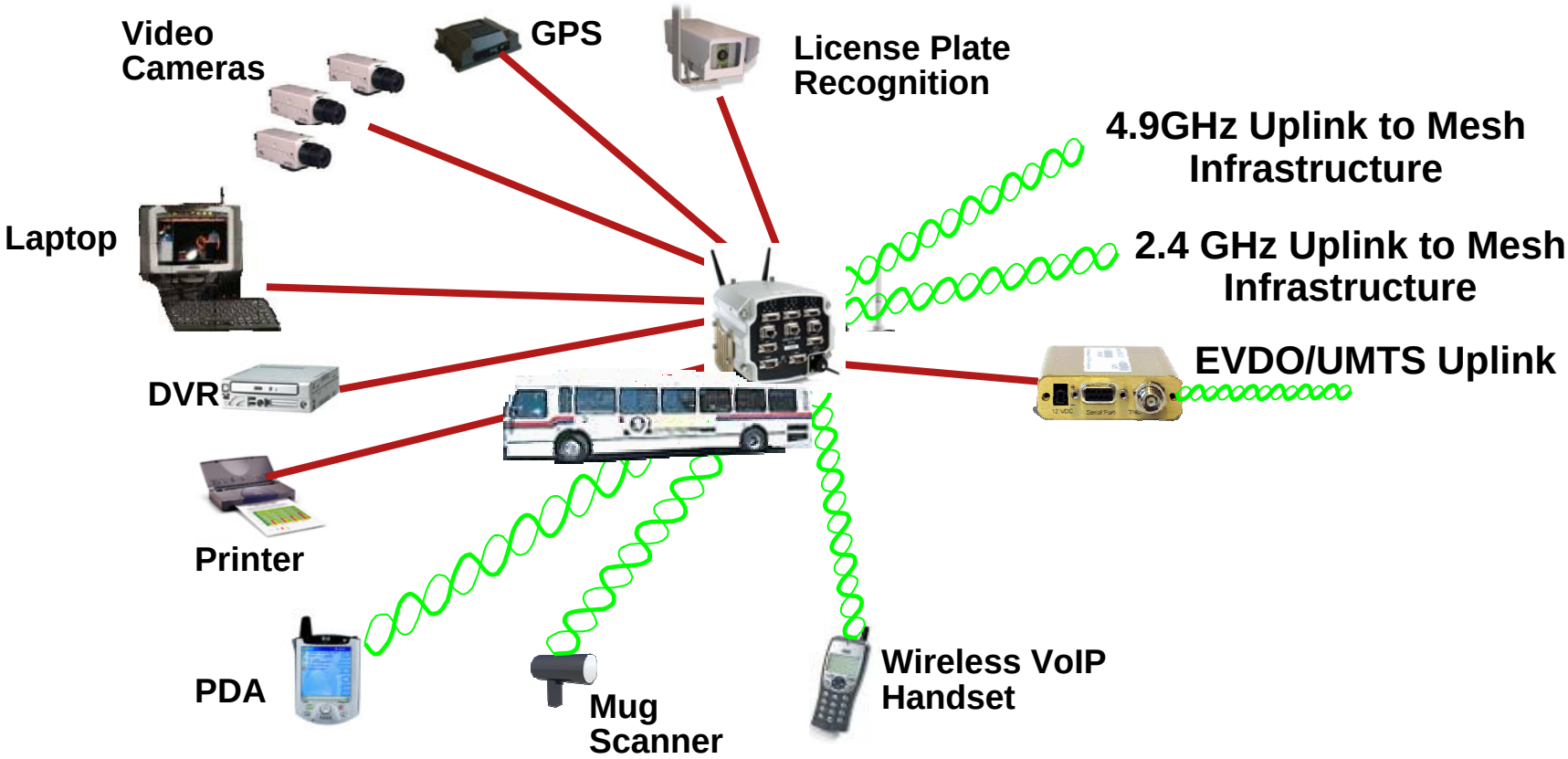
Example Configuration in a Vehicle



Cisco Outdoor Wireless Network Solution

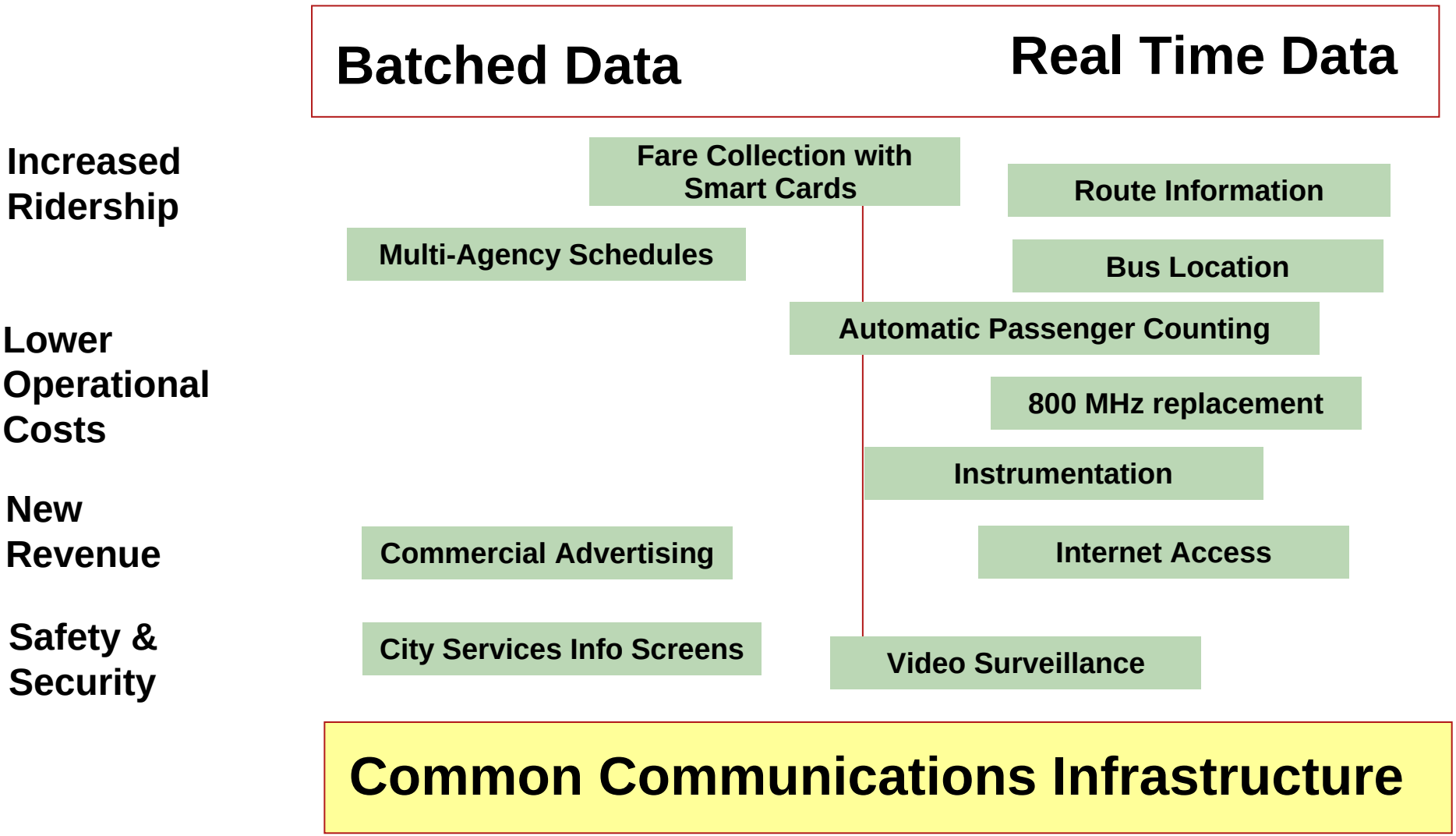


In-Vehicle Network for Real-Time Communications

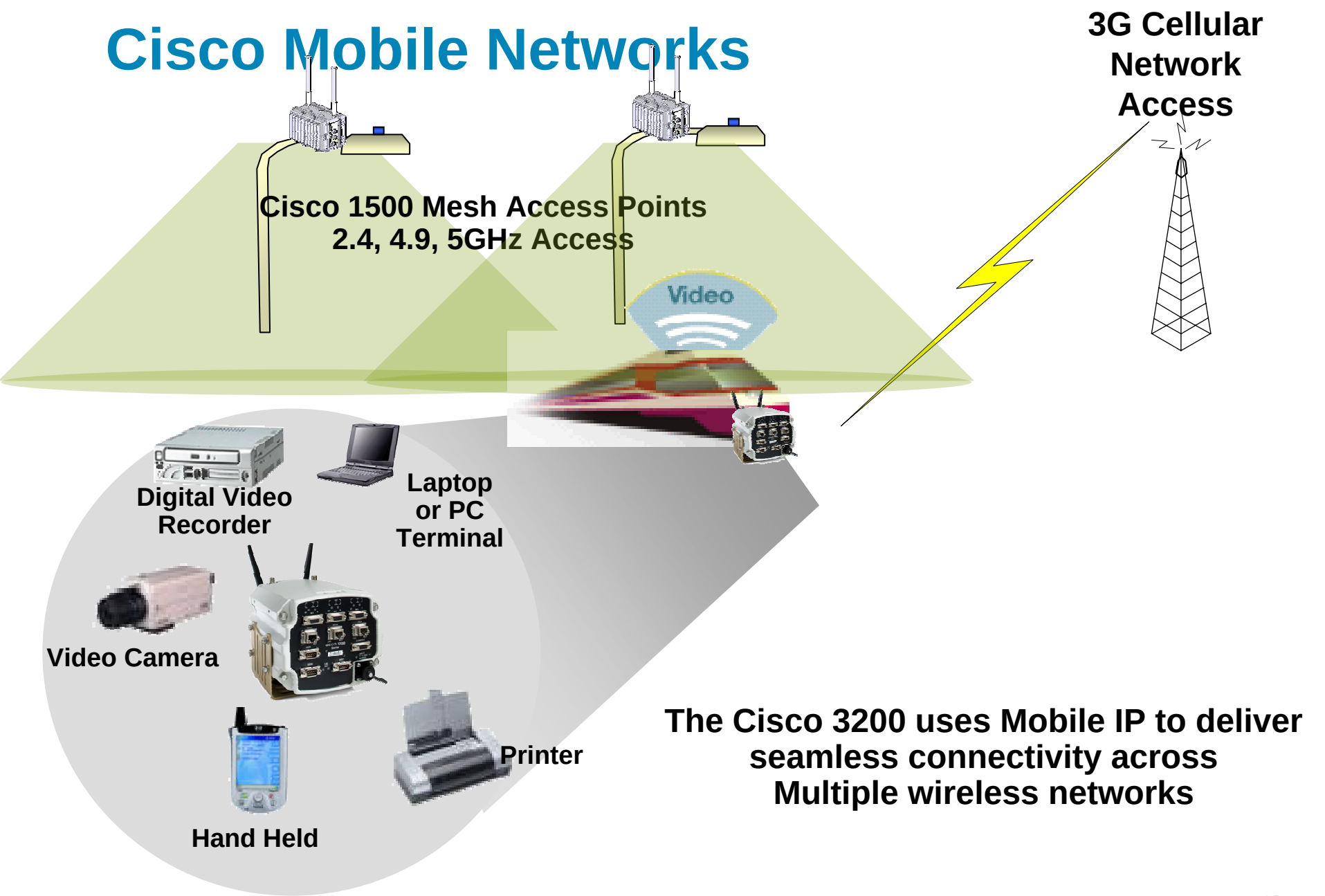


The Mobile router 'networks' the car, bus, or train and becomes an extension of the office network

Transit Applications

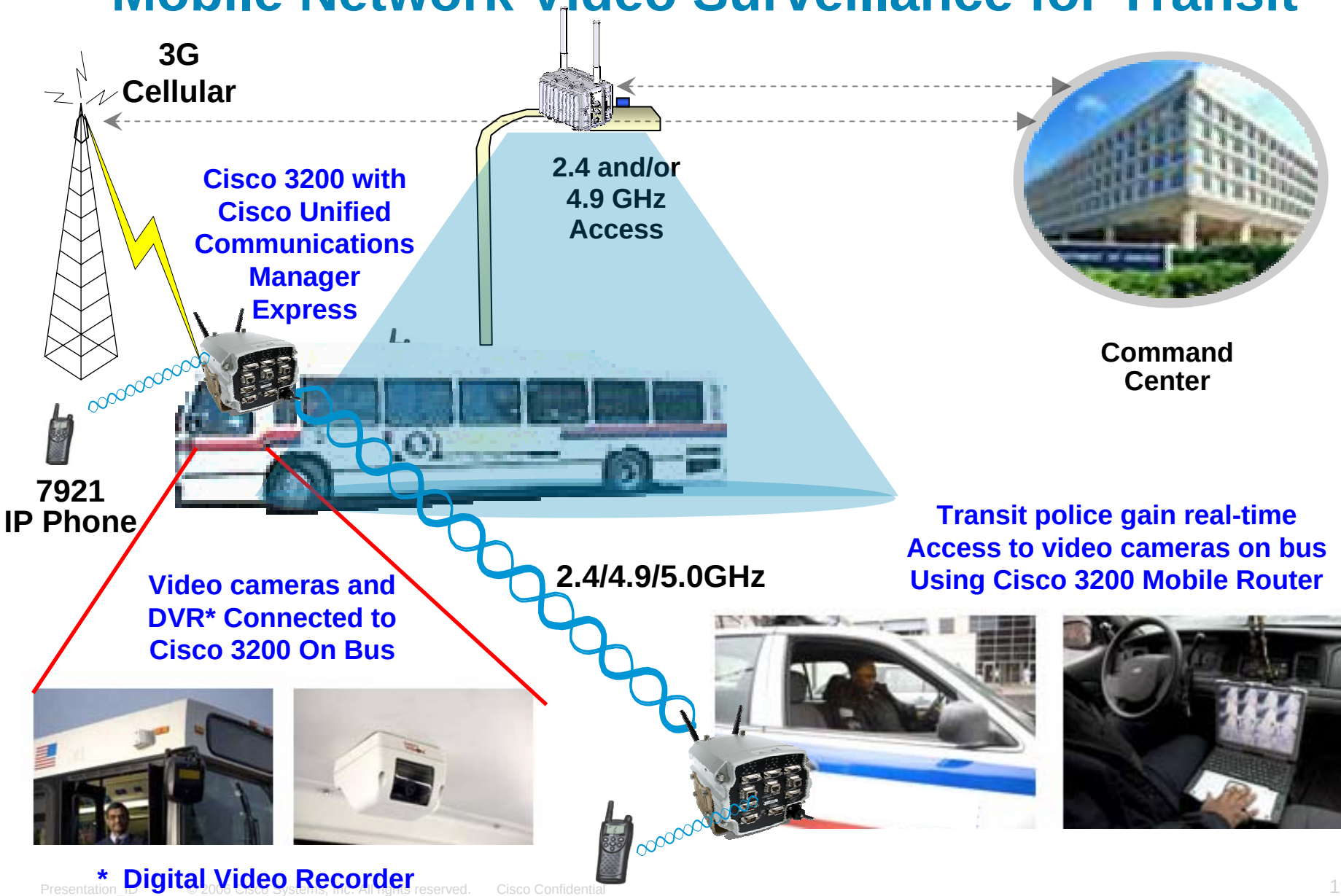


Cisco Mobile Networks

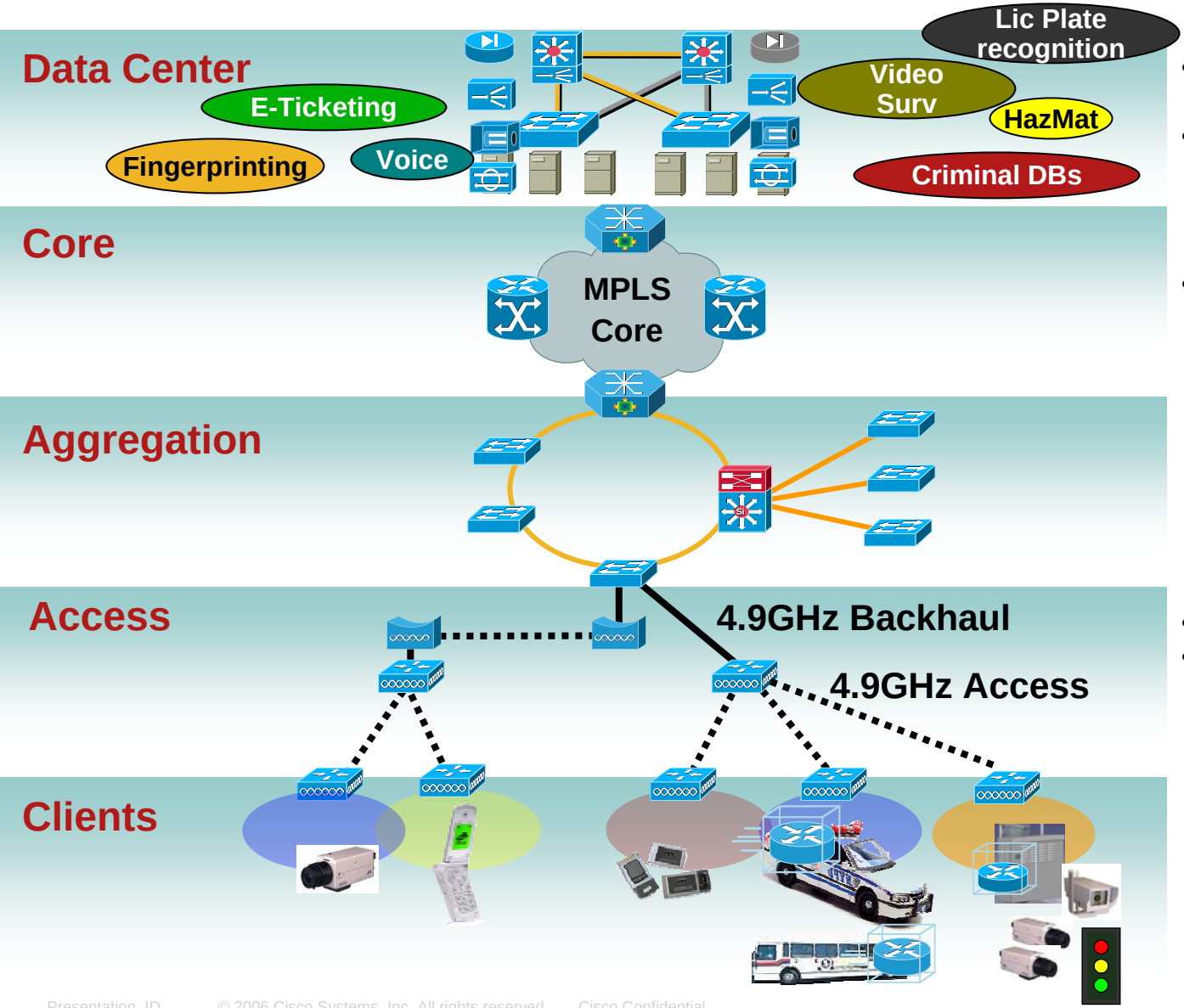


The Cisco 3200 uses Mobile IP to deliver seamless connectivity across Multiple wireless networks

Mobile Network Video Surveillance for Transit



Outdoor Wireless Topology for Transportation & Public Safety



- Secure Data Center for application access
- Storage Network for Video archives and DBs

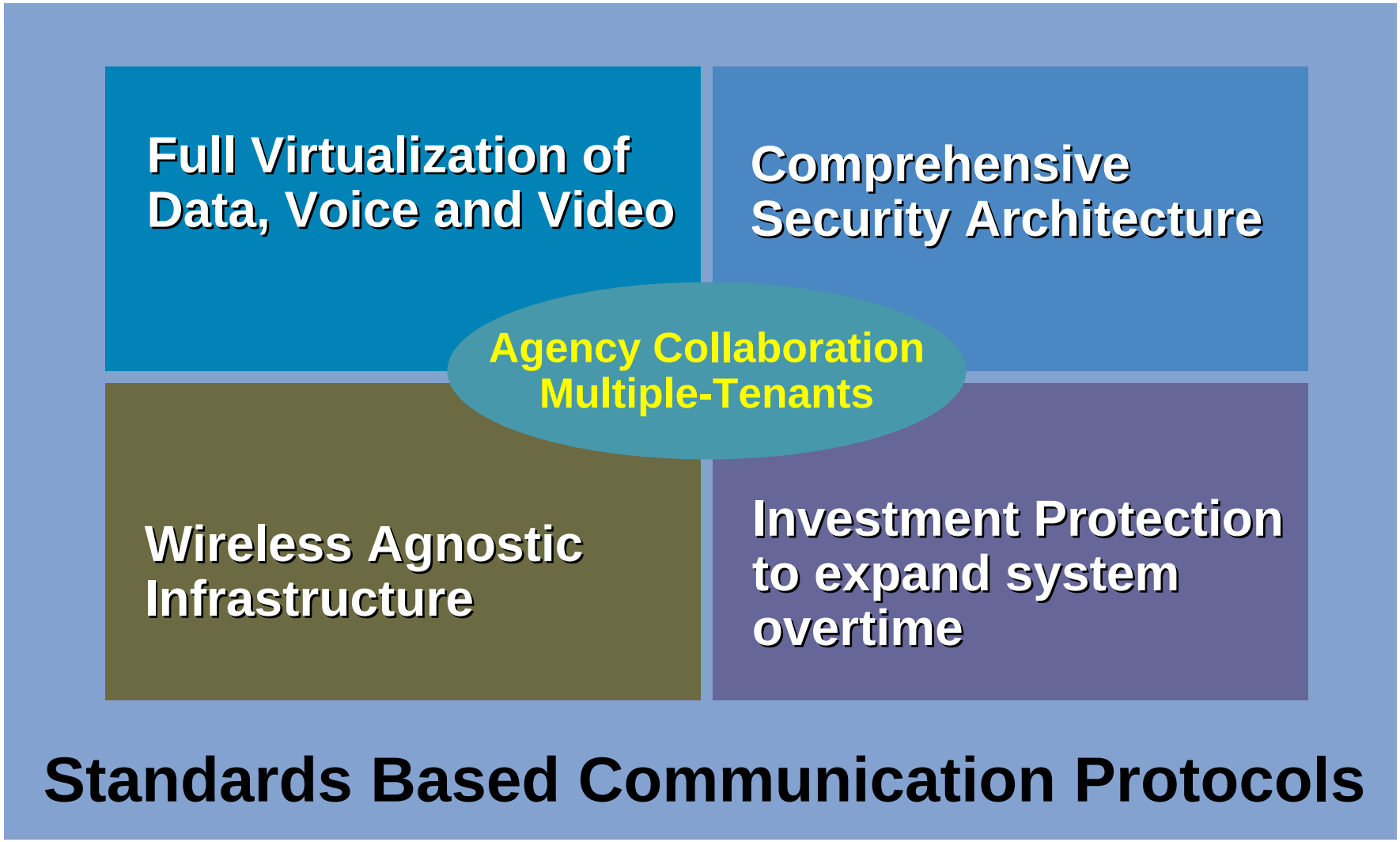
- Map WLAN VLANs to VPNs or VRFs

- Fiber-based MetroE Networks

- 5GHz or 4.9GHz backhaul
- 1300s/1400s connecting remote Mesh trees

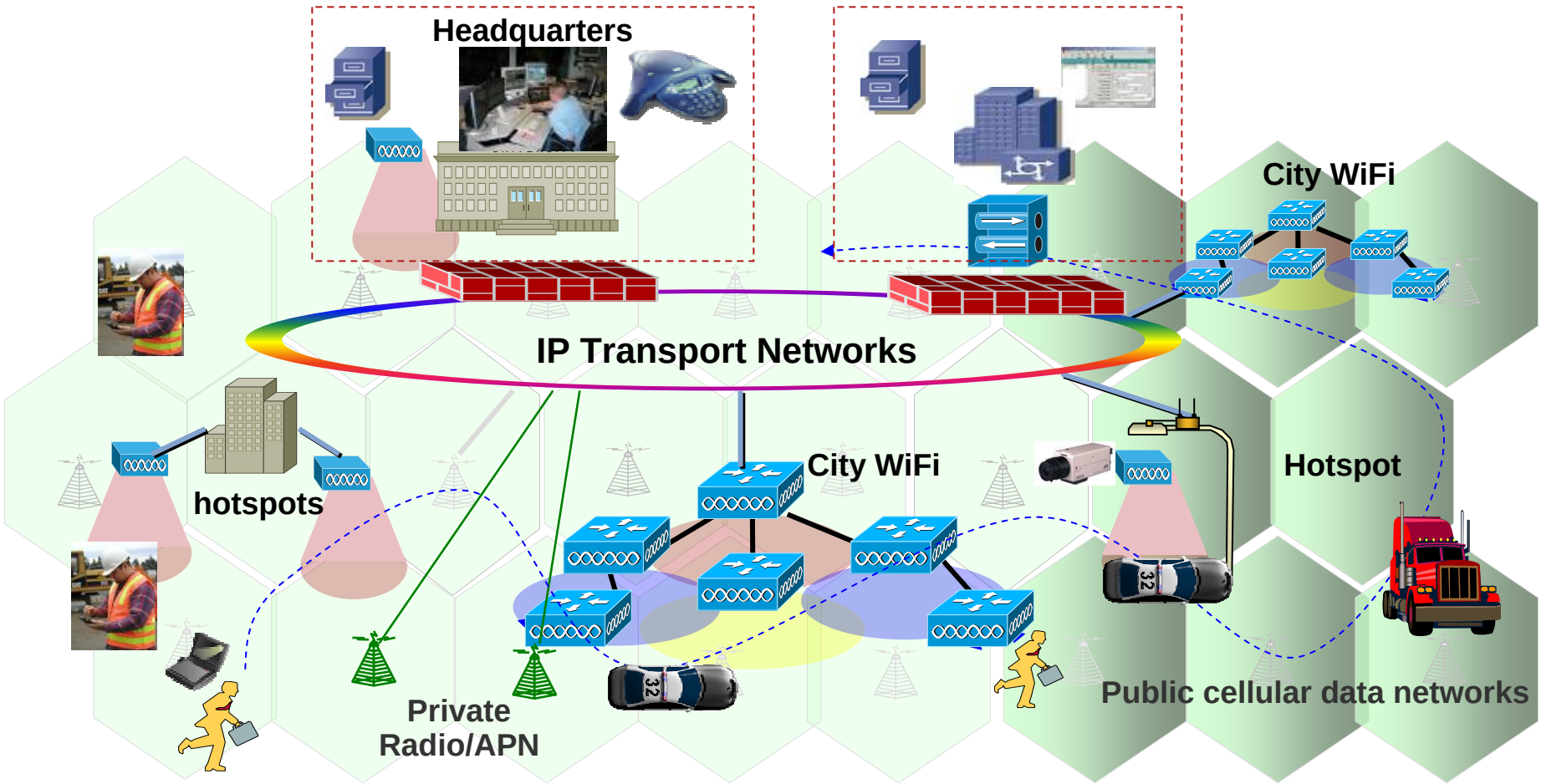
- 3200+Mesh
- 2.4Ghz CCX Clients
- Cisco Mobile IPSec VPN Clients

End-to-End Requirements for extending the network into vehicles & outdoors

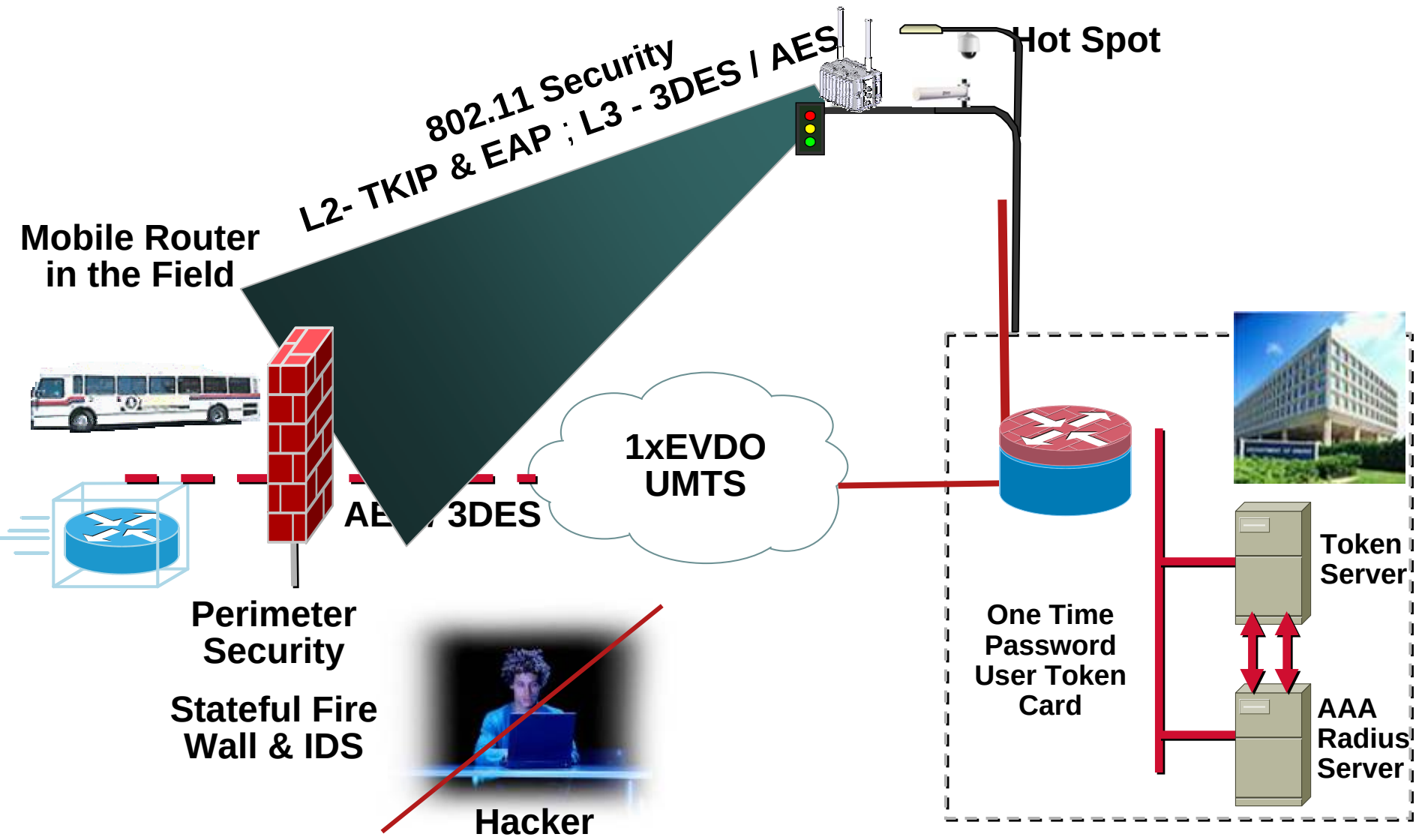


Secure Mobile Wireless Networking

Seamless, dynamic, and secure connectivity from anywhere, anyplace, anytime



Standards Based Security & Management



Intelligent Video Solution

2-Port Video Server
Available Today
1 DSP (TI 642)

4-Port Video Server
Available Spring ’07
2 DSP’s (TI 642)

- 2-4 video inputs including video streaming
- MPEG-2, MPEG4, MJPEG, H.264 Prepared
- MPEG-1, MP3 Audio Codecs
- PTZ Support
- 1-2 Composite Video Outputs
- Fully industrial grade: -40ºC to 185ºF
- 2-4 Mono or1- 2 Stereo Audio Inputs/Outputs
- Relay Outputs
- TTL Alarm Inputs (4 per DSP)
- RS232 and RS422/RS485
- 1Ethernet port, 10/100 Base-T
- 256 MBytes SDRAM per DSP
- Up to 4 GByte NAND FLASH

Application Support (Available Today)

- Video Analytics – ObjectVideo
- Video Management – Broadware
- Notions GUI with Vehicle Interface

Application Support (Near Future)

- License plate Recognition – VigilantVideo
- Video Management – EMC, Genetec, Cisco

Available Today: Intelligent Wireless Video Surveillance Networking with the Cisco 3200 Series Router

Intelligent Video

- Application Adaptive Video
- Intelligent Video Analytics
- Transrating
- Codec Interoperability
- Interoperability with Analog & Digital Cameras

+

Intelligent Wireless Networking

- Wireless Mesh Architecture
- Support for Multiple Wired & Wireless Backhauls
- Multicast & QoS
- Multiple Layers of IP Security

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Intelligent Wireless Video Surveillance Networking

- More Effective Use of Data
- Efficient use of Network resources
- Shared Information in Real Time
- More Cost Effective Deployments
- Integration with other sensor applications

Summary

- Seamless mobility across *multiple* wireless networks
- Standards Based
  - Seamless integration of multiple technologies & applications
  - Interoperability
- Comprehensive Functionality
  - Security
  - QoS & Mobile IP
  - Manageability
  - Performance
- Extended end-to-end solution to include vehicles & Personnel