4G, 5G, and 6G Use Cases for DHS

Developments in wireless networks enable evolving applications for general and DHS mission focused technologies. DHS operators can reference 4G and 5G enabled use cases to understand capabilities that are currently or soon to be available and use projections of 6G use cases to plan for the coming decade.

2010 — 2020 — 2030+

General Use Cases

4G (2010)
- Wireless Video Conferencing
- Cloud Computing
- Enhanced Video Surveillance
- Smart Wearable Devices
- Connected Traffic Infrastructure
- Digital Signatures
- Media Sharing
- Vehicle Hotspot/GPS

5G (2020)
- Smart Surveillance Infrastructure
- Connected Industrial Controls
- Enhanced Urban IoT Devices
- Semi-Autonomous Vehicles
- Augmented Reality/Virtual Reality (AR/VR)
- Real-Time Facial Recognition
- Smart Warehouses
- Remote Maintenance and Inspection Robots
- Intelligent Power Systems
- High Precision Asset Tracking
- Real-Time Automation for Manufacturing

6G (2030+)
- Extended Sensor Networks w/ Continuous Data Transfer
- Distributed Computer Vision Sensors
- Smart Cities/Roads
- Automated Mobile Communications
- Fully Autonomous Vehicles
- Distributed Mobile Edge Computing
- Enhanced Predictive AI
- Digital Twin AR/VR Devices

Mission-Focused Use Cases

4G (2010)
- Real-Time UAS Video Feeds for Border/Infrastructure Surveillance
- Mobile First Responder Emergency Communications Systems (FirstNet, Mission Critical Push-to-Talk)
- Real-Time Traffic Monitoring for First Responders
- Real-Time First Responder Physiological Monitoring with Connected Wearables
- Cloud-Connected Common Operating Picture (COP) Ecosystems for Border Surveillance and Remote Screening
- Vehicle-Based Device Connectivity for Disaster Response/Border Patrol

5G (2020)
- First Responder Priority Networks
- Indoor and Outdoor Geolocation of First Responders
- Search and Rescue UAS Fleets
- High Speed/Uninterrupted Surveillance Coverage in Remote Border Areas
- Smart Surveillance/Control Systems for Critical Infrastructure Protection
- Distributed Coastal Surveillance
- Connected Smart Ports
- Real-Time Gunshot Audio Detection for Law Enforcement
- Predictive Natural Disaster Monitoring
- AR/VR Mobile Aviation Security Screening
- Smart Biometrics for Identity Verification at Airports/Borders
- Broad Edge Device Deployment in Remote Border Areas
- Predictive Aviation Security Screening
- Autonomous Drone Inspections of Critical Infrastructure

6G (2030+)
- Widely Distributed Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Sensors
- Autonomous Border Surveillance in Remote Environments
- Advanced Edge/AI-Enabled Sensors for Tunnel Detection at Greater Depths/Penetration
- Predictive Traffic Pattern Tracking for First Responders
- Digital Security Screening
- Autonomous Cargo Inspections
- Autonomous Drone Teaming for Disaster Response and Border Surveillance

4G   5G   6G