# 21 Breakthrough Firefighting Technologies for 2025 (Free Procurement Checklist)

## Advanced Firefighting Drones

### 1. Tethered Firefighting Drones

Drones like the LT-UAVFW system can carry 100kg payloads (water/equipment) and reach heights of 100m with ultra-light hoses. Ideal for high-rise fires.

🔗  [LT-UAVFW System](https://www.researchgate.net/publication/334632039_Design_and_Development_of_a_Tethered_Drone_System_for_Firefighting_Operations_in_High-Rise_Buildings)

### 2. Search/Rescue Drones with Thermal Imaging

Equipped with FLIR Zenmuse XT2 cameras and AI human detection to locate victims through smoke.

🔗  [FLIR Zenmuse XT2](https://www.flir.com/products/zenmuse-xt2/)🔗  [Colorado Springs Drone Program](https://www.firerescue1.com/fire-products/drones/colo-firefighters-turn-to-drones-for-faster-smarter-rescues)

### 3. Drone Docking Stations

Automated systems like FlytBase enable rapid deployment and fleet management.

🔗  [FlytBase Management System](https://www.flytbase.com/)

### 4. Prop-Wash Drones

Use downward wind force to disperse toxic fumes and create survivable air pockets for victims.

🔗  [Hernando County Fire Rescue](https://spectrumlocalnews.com/tx/south-texas-el-paso/news/2025/03/25/new-technology-helping-hernando-county-fire-rescue-firefighters-make-work-more-efficient-amid-staffing-shortage)

## Smart Firefighting Apparatus

### 5. Telescopic Fire Trucks

Pierce Enforcer Ascendant 100’ aerial ladders with 75m+ reach and integrated drone launch systems.

🔗  [Pierce Manufacturing](https://www.fireengineering.com/industry-news/pierce-manufacturing-demonstrates-next-generation-fire-apparatus-and-technology-at-fdic-2025/)

### 6. Collision Avoidance Mitigation Systems (CAMS)

AI-powered radar systems to prevent vehicle accidents during emergency responses.

🔗  [Firehouse Tech Trends](https://www.firehouse.com/technology/article/55251795/5-in-2025-fire-service-technolgy-trends)

### 7. Hybrid/Electric Pumpers

Pierce Volterra™ trucks with 2,000 GPM capacity and silent operation modes.

🔗  [Pierce Volterra](https://www.piercemfg.com/en/trucks/volterra)

### 8. Smart Nozzles

Push-button water activation to reduce radio reliance during chaotic fireground operations.

🔗  [Hernando County Smart Nozzles](https://spectrumlocalnews.com/tx/south-texas-el-paso/news/2025/03/25/new-technology-helping-hernando-county-fire-rescue-firefighters-make-work-more-efficient-amid-staffing-shortage)

## AI & Data-Driven Systems

### 9. AI-Powered CAD-to-CAD Dispatch

Real-time coordination for mutual aid responses using AI analysis.  
 🔗  [Firehouse AI Trends](https://www.firehouse.com/technology/article/55251795/5-in-2025-fire-service-technolgy-trends)

### 10. Predictive Fire Spread Software

Integrates weather/GIS data to forecast fire behavior (e.g., Lockheed Martin’s digital fire models).

🔗  [Lockheed Martin AI](https://www.latimes.com/business/story/2025-01-21/tech-wildfires-ai-la-fires-nvidia-lockheed-martin)

### 11. Digital Twins for Buildings

3D models for pre-incident planning and real-time fire spread simulation.

🔗  [Technavio Fire Protection Market](https://www.prnewswire.com/news-releases/fire-protection-system-market-to-grow-by-usd-14-58-billion-2024-2028-boosted-by-iot--big-data-integration-with-smoke-detectors-with-ai-driving-market-transformation---technavio-302364763.html)

### 12. NERIS (National Emergency Response Information System)

Replaces NFIRS with geospatial data and machine learning for risk reduction.

🔗  [US Fire Administration NERIS](https://www.firehouse.com/technology/article/55251795/5-in-2025-fire-service-technolgy-trends)

## Firefighter Wearables & PPE

### 12. C-THRU AR Helmets

Augmented reality heads-up displays with thermal imaging and navigation aids.

🔗  [Qwake Technologies C-THRU](https://www.dhs.gov/science-and-technology/news/2023/11/06/feature-article-picturing-future-firefighting)

### 14. Biometric Trackers (e.g., WHOOP Bands)

Monitor heart rate, heat stress, and fatigue in real-time.

🔗  [Firehouse Wearable Tech](https://www.firehouse.com/technology/article/55251795/5-in-2025-fire-service-technolgy-trends)

### 15. PFAS-Free Turnout Gear

Compliant with updated OSHA/NFP standards to reduce carcinogen exposure.

🔗  [NFPA Standards](https://www.nfpa.org/)

## Communication & Command Tools

### 16. 5G Rugged Tablets

Panasonic TOUGHBOOK devices with glove-touch screens for incident tracking.

🔗  [Tablet Command Software](https://www.firehouse.com/technology/article/55251795/5-in-2025-fire-service-technolgy-trends)

### 17. Satellite-to-Cell Comms

Ensures connectivity in rural/urban dead zones (e.g., Starlink integration).

🔗  [Colorado Springs Starlink Drones](https://www.firerescue1.com/fire-products/drones/colo-firefighters-turn-to-drones-for-faster-smarter-rescues)

## Training & Simulation

### 18. XR (AR/VR) Platforms

High-rise and wildfire scenario training with AI-driven analytics.

🔗  [Firehouse VR Training](https://www.firehouse.com/technology/article/55251795/5-in-2025-fire-service-technolgy-trends)

### 19. AI Training Analytics

Tracks skill retention and identifies gaps in firefighter performance.

🔗  [Technavio AI in Fire Safety](https://www.prnewswire.com/news-releases/fire-protection-system-market-to-grow-by-usd-14-58-billion-2024-2028-boosted-by-iot--big-data-integration-with-smoke-detectors-with-ai-driving-market-transformation---technavio-302364763.html)

## Infrastructure Upgrades

### 20. IoT Sensor Networks

Early smoke/heat detection with wireless connectivity for older buildings.

🔗  [Impact Fire IoT Detection](https://resources.impactfireservices.com/fire-detection-technology-advancements)

### 21. Automated Secure Alarm Protocol (ASAP)

Direct alarm-to-PSAP alerts to reduce response times.

🔗  [Technavio ASAP Systems](https://www.prnewswire.com/news-releases/fire-protection-system-market-to-grow-by-usd-14-58-billion-2024-2028-boosted-by-iot--big-data-integration-with-smoke-detectors-with-ai-driving-market-transformation---technavio-302364763.html)