



# Public Safety Spinoffs



NASA has a long history of finding applications of space and aeronautics technologies that provide broad public benefits. The basis for the Agency's direction to do this can be directly traced to the National Aeronautics and Space Act that created NASA in 1958. Since that initial call to action, NASA's emphasis on safety has translated not just to its rocket launches and laboratory practices, but also to innovations that improve our everyday lives, protecting the public and making us safer by supporting emergency responders, providing for people in crisis situations, detecting biological and chemical threats, and enhancing national security efforts at home and abroad.



### **Apollo-Era Life Raft Saves Hundreds of Lives**

During the Apollo Program, engineers at NASA designed and patented a hydrodynamically stabilized ballast system that would prevent a life raft from tipping in choppy seas and fierce winds. It has been commercialized and since been credited with saving over 400 lives.



### **Sensors Provide Early Warning of Biological Threats**

Powerful NASA biosensor technology has been incorporated into a water analyzer that can alert organizations to potential biological hazards in water used for agriculture, food and beverages, showers, and at beaches and lakes—within hours instead of the days required by conventional laboratory methods.



### **Robots Save Soldiers' Lives Overseas**

NASA efforts to help humans and robots to work together in remote environments led to the development of an improved reconnaissance robot deployed to war zones. Boasting a bevy of advanced capabilities, the newly-designed, remotely operated reconnaissance robot identifies improvised explosive devices (IEDs), allowing troops to maintain a safe distance.



### **Space Suit Technologies Protect Deep-Sea Divers**

A company has incorporated NASA space suit innovations into deep-sea diving gear designed to protect divers who are called on to work in extreme and dangerous conditions caused by high pressure, chemical and biological warfare agents, and the toxic environments of shipwrecks and chemical spills.



### **Polymer Fabric Protects Firefighters, Military, and Civilians**

NASA helped develop a line of polymer textiles for use in space suits and vehicles. Dubbed PBI, the heat and flame resistant fiber is now used in numerous firefighting, military, motor sports, and other applications.



### **Infrared Imaging Sharpens View in Critical Situations**

NASA research into thermal imaging to help detect microgravity fires in space led to all-weather infrared imaging systems now being used in the United States and abroad to locate personnel stranded in emergency situations and to protect high-value facilities and operations—including soldiers in the battlefield.



### **Filtration System Provides Clean Drinking Water**

A filtration system providing safe, affordable drinking water is the result of work done to create a simple wastewater remediation unit for the International Space Station. The commercial version of the technology yields clean water from the most challenging water sources, such as in underdeveloped regions where water may be heavily contaminated.



### **Fire-Resistant Reinforcement Makes Steel Structures Sturdier**

Fire-resistant material developed for the Apollo crew capsule heat shield now coats steel beams in high-rise buildings. The material—easy to apply, with no impact on architectural design—helps prevent infrastructures from collapsing prematurely in a fire, giving occupants more time to evacuate safely.



### **Anthrax Detector Protects Air Supplies**

Designed originally as a bacterial spore detection system for Mars-bound spacecraft, the technology in the Anthrax Smoke Detector tests airborne particles for weaponized anthrax. The device is being used at airports, office buildings, and post offices worldwide.



### **Rocket-fuel Device Neutralizes Land Mines**

Surplus rocket fuel is used in a flare that can safely destroy land mines. The demining device is placed next to a land mine and ignited by a battery-triggered electric match. The flare burns a hole in the mine's case and ignites the explosive contents. Once the explosive material is burned away, the mine is no longer dangerous.

For more information about NASA spinoffs, please visit [spinoff.nasa.gov](http://spinoff.nasa.gov).