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# Bos

Drones for **better wildfire management.**

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**We are Bos, a pre-seed  
aerospace startup,  
dedicated to combating  
the growing global wildfire  
crisis.**

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# \$893 billion p.a.

Economic costs and damages caused by wildfires in the USA alone

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# Problem

## Wildfires: A Flaring Global Crisis

*As wildfires intensify globally, there's an urgent need for cost-effective, technologically advanced solutions to enhance wildfire management and aerial firefighting capabilities.*

**Escalating Threat:** Wildfires are becoming more frequent and severe globally, endangering lives, property, and ecosystems. [1]

**Staggering Costs:** In the US alone, climate-exacerbated wildfires cost up to \$893 billion annually in damages and related expenses. [2]

**Aerial Firefighting Challenges:** Traditional aerial firefighting methods, relying on crewed aircraft like airtankers and helicopters, have limitations:

- High operational costs (e.g., \$500+ million spent by US Forest Service in 2017) [3]
  - Demand often exceeds supply during peak fire seasons [4]
  - They cannot operate at night, in challenging weather conditions, or heavy smoke
  - There are limited numbers of these aircraft, and they require specialised pilots
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# Our Vision

The application of advanced technologies and novel aerospace vehicles to combat the growing wildfire crisis.



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*UAVs offer an economical, safer, and highly adaptable solution for modern wildfire management, addressing critical challenges faced by firefighting teams globally.*

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# Solution

## UAV Applications in Wildfire Management

**Early Detection:** UAVs equipped with thermal and optical sensors for rapid fire detection

**Real-Time Monitoring:** Continuous data collection on fire spread and intensity

**Intelligent Prediction:** AI-powered analysis for fire behavior forecasting

**Aerial Attack:** Water and fire retardant bombing for direct firefighting

**Tactical Coordination:** Direct and guide manned airtankers for precise retardant drops

**Logistical Support:** Transporting equipment and resupplying ground crews

**Search and Rescue:** Locating and assisting trapped individuals in fire-affected areas

**Post-Fire Assessment:** Rapid mapping of burned areas for recovery planning

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# Why UAVs?

- **24/7 Operation:** UAVs can operate day and night, even in poor visibility conditions, expanding the operational window beyond the capabilities of crewed aircraft.
- **Enhanced Safety:** UAVs remove the risk to human pilots, who often fly in dangerous conditions.
- **Rapid Deployment:** UAVs can be deployed quickly and strategically positioned closer to wildfires, minimising response times.
- **Cost-Effectiveness:** UAVs are significantly cheaper to operate and maintain than traditional firefighting aircraft.
- **Scalability:** UAV swarms can be scaled to match the size and intensity of a fire, providing flexible response capabilities.
- **Data Collection:** Equipped with sensors, UAVs can provide real-time data on fire behaviour, weather conditions, and terrain, enabling better decision-making.



# Prospective Capability

An integrated end-to-end solution

## Observe

### *High-altitude Platform Station*

- Early Detection
- Long-endurance UAV
- Wide-area coverage for regional monitoring

## Orient

### *Fixed Wing UAV*

- Provides detailed Situational Awareness
- Modular payload system for mission-specific equipment
- Single operator launch

## Decide

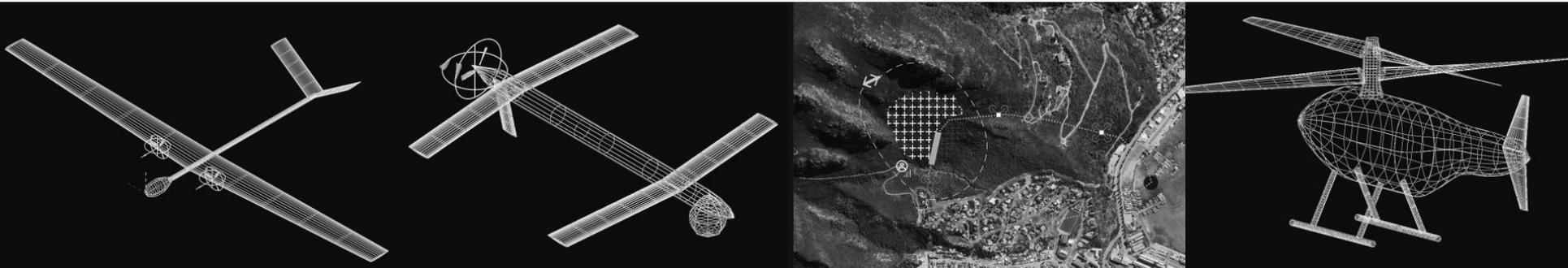
### *Command and Control System*

- Intelligent Prediction
- Unified communication between all stakeholders
- Integration of multi-source data
- Interoperability with existing platforms

## Act

### *Heavy Lift VTOL UAV*

- Precision drop system for targeted firefighting
- Long-range operation for remote area access
- Modular design to support various missions



# Strategic Product Evolution

A phased approach to delivering comprehensive wildfire management

## Customer Discovery

Engage with fire services to deeply understand operational challenges and requirements. This direct engagement ensures our solutions are purpose-built to address real-world firefighting needs and user priorities.

## Enhanced Capabilities

Refine and expand the capabilities of our initial products based on field testing and user feedback. Deploy enhanced versions with validated features and improvements to establish market presence.

## Complete System Integration

Create an integrated firefighting solution combining all platforms. A unified system delivering comprehensive detection, monitoring, and firefighting capabilities.

## Initial Product Development

Create our core Fixed Wing UAV and Command & Control platform as minimum viable products. This focused approach allows rapid deployment of essential capabilities and enables early customer feedback through real-world testing.

## Advanced Platform Development

Launch development of our HAPS and heavy lift VTOL aircraft, incorporating insights from Fixed Wing UAV operations and evolving customer needs. These platforms expand our solution to address additional firefighting scenarios.

# Global Perspectives

## Case Studies in Aerial Wildfire Fighting

### California

**Resources:** World's largest aerial fleet, with \$2.7 billion investment [5]

**Strategy:** Rapid initial attack, advanced tech integration (AI, satellites)

**Challenge:** High operational costs, increasing fire frequency

### Greece

**Resources:** Limited domestic capabilities

**Strategy:** Relies on EU Civil Protection Mechanism for support [6]

**Challenge:** Need for robust domestic aerial firefighting capacity

### South Africa

**Resources:** Limited aerial assets, mix of government and private sector

**Strategy:** Rapid initial attack, seasonal deployment in high-risk areas

**Challenge:** Resource constraints, increasing fire frequency and intensity

*These case studies highlight the global disparity in aerial firefighting capabilities and the **urgent need** for innovative, cost-effective solutions accessible to all countries.*

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# Founder

## Kaelan Grafton

BSc (Hons), MSc, PGDip, MRAeS

Kaelan brings comprehensive expertise spanning mechanical and structural design, systems engineering, and aircraft conceptual design. His multifaceted background combines hands-on technical work, academic research, and diverse industry experience, forming a robust foundation for aerospace innovation.

[kaelangrafton.com](http://kaelangrafton.com)

[linkedin.com/in/kaelangrafton/](https://www.linkedin.com/in/kaelangrafton/)



**BAE SYSTEMS**





**Join Bos in our mission: We're seeking pre-seed funding and strategic partnerships to transform wildfire management globally.**

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# References

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