Executive Summary

This project proposes the development of a **real-time aerial mapping service** that leverages drone technology to deliver high-resolution, up-to-date aerial maps for industries such as agriculture, construction, disaster response, and urban planning. The service aims to bridge the gap between traditional satellite imagery—which often suffers from delays and low resolution—and the growing demand for real-time, precise geospatial data.

Several alternatives were considered, including:

- **Traditional satellite imagery services**: While global in scope, they lack the resolution and timeliness required for many applications.
- **Manned aerial surveys**: These offer high quality but are costly, logistically complex, and not scalable.
- **Crowdsourced drone data platforms**: These are limited in coverage and consistency.

A cost-benefit analysis reveals that while initial investment in drone fleets, data processing infrastructure, and regulatory compliance is significant, the long-term benefits—such as subscription-based revenue, data licensing, and service contracts—far outweigh the costs. Tangible benefits include faster decision-making, reduced operational costs for clients, and improved safety in hazardous environments. Intangible benefits include enhanced brand reputation and innovation leadership.

Key risks include regulatory hurdles, drone operation safety, and data privacy concerns. These will be mitigated through proactive engagement with aviation authorities, robust safety protocols, and secure data handling practices.

Project Background / Description

Project Overview

The proposed project is a **real-time aerial mapping service** that utilizes a fleet of drones equipped with high-resolution cameras and sensors to capture, process, and deliver live aerial imagery and geospatial data. The service is designed to provide clients with up-to-date, accurate, and actionable maps for a variety of applications including agriculture, construction, disaster response, urban planning, and environmental monitoring. The system will integrate drone operations with cloud-based data processing and visualization tools, enabling users to access real-time maps through a secure web platform or API.

Opportunity and Motivation

The motivation for this project stems from the growing demand for **timely and high-resolution geospatial data** that traditional satellite imagery and manned aerial surveys cannot consistently provide. Industries are increasingly reliant on real-time data to make

informed decisions, optimize operations, and respond to dynamic conditions. For example, farmers need to monitor crop health in near real-time, construction managers require up-to-date site maps, and emergency responders benefit from live situational awareness during disasters, firefighters need to eliminate unnecessary risk when mapping out wildfires.

This project capitalizes on recent advancements in drone technology, real-time 3D reconstruction, and cloud computing to offer a scalable and cost-effective solution. By addressing the limitations of existing mapping services, this project presents a significant opportunity to disrupt the geospatial data market and deliver substantial value to a wide range of stakeholders.

Cost/Benefit Analysis

Capital Costs Breakdown

Item	Cost (USD)
Drone Manufacturing (180 units)	$ 142,344
Mobile Command Trailers (10 × $275,000)	$ 2,750,000
Tow Vehicles (10 × $60,000)	$ 600,000
Mobile Command Centers (5 × $40,000)	$ 200,000
Maintenance Tools, Spare Parts, IT, Security	$ 100,000
Total Capital Cost	**$ 3,792,344**

Drone Manufacturing Includes:

- Battery Packs (4 per drone, 48 cells total): $ 196.80 (Each cell is a Sony Murata VTC6 18650)
- 4K Camera (e-CAM82_USB): $ 94.00
- Carbon Fiber Frame, Motors, ESCs, Flight Controller, GPS, Telemetry, PDB, Wiring: $ 500.00
- **Total per Drone:** $ 790.80 × 180 = $ 142,344

Mobile Command Trailers:

- Base Trailer (Overwatch Mobile Command Trailer): $ 175,000
- Modifications: $ 100,000
- **Total per Trailer:** $ 275,000 × 10 = $ 2,750,000

Tow Vehicles:

- Ford F-150 XLT or similar: $ 60,000 each
- **Total:** $ 60,000 × 10 = $ 600,000

Mobile Command Centers:

- Mobile Command Centers: $40,000 each
- **Total:** $ 40,000 × 5 = $ 200,000

Note: Costs for facility leasing (storage & office) have been moved to the Operational Costs section.

Operational Costs (Annual)

Item	Cost (USD)
Drone Maintenance	$ 90,000
Staff Salaries	$ 3,725,000
Cloud Services	$ 100,000
Marketing & Customer Acquisition	$ 50,000
Miscellaneous	$ 25,000
Energy Consumption (180 drones)	$ 18,200
Facility Lease (Storage & Office)	**$ 475,475**
Total Operational Cost	**$ 4,483,675**

Staff Salaries Calculation

Position/Role	Number of Employees	Salary per Employee (USD, Annual)	Total Salary (USD)
Operations Manager / Team Lead	1	$100,000	$100,000
Technical Lead / Data Systems Manager	1	$85,000	$85,000
Data Analyst / GIS Specialist	1	$70,000	$70,000
Sales & Marketing Specialist	1	$70,000	$70,000
Administrative/Finance Specialist	1	$55,000	$55,000
Drone Maintenance Technician	2	$65,000	$130,000
IT Support/Systems Administrator	1	$90,000	$90,000
Transport Unit/Drone Operators	10	$70,000	$700,000
Emergency Management Support Operators	25	$75,000	$1,875,000
Business Analyst	1	$80,000	$80,000
Risk Analyst	1	$80,000	$80,000

Position/Role	Number of Employees	Salary per Employee (USD, Annual)	Total Salary (USD)
QA Lead	1	$80,000	$80,000
Training Lead	1	$75,000	$75,000
Marketing Lead	1	$80,000	$80,000
Admin	1	$55,000	$55,000
Grand Total	**50**		**$3,725,000**

Energy Cost Calculation:

Parameter	Value	Calculation/Notes
Cells per Battery Pack	12 cells	Sony Murata VTC6 18650 in series
Nominal Voltage per Cell	3.6 V	Typical for Sony Murata VTC6
Capacity per Cell	3000 mAh (3 Ah)	
Nominal Energy per Cell	~10.8 Wh	3.6 V × 3 Ah
Nominal Energy per Battery Pack	129.6 Wh	12 × 10.8 Wh
Battery Packs Used per Day per Drone	20	Full capacity operation
Daily Energy Consumption per Drone	2.592 kWh	20 × 129.6 Wh = 2592 Wh = 2.592 kWh
Operating Days per Year	300 days	Assumed operation days per year
Annual Energy Consumption per Drone	777.6 kWh	2.592 kWh/day × 300 days = 777.6 kWh
Number of Drones	180	
Total Annual Energy Consumption	~140,000 kWh	777.6 kWh × 180 ≈ 139,968 kWh (~140,000 kWh)
Electricity Rate	$0.13 per kWh	
Annual Energy Cost	**~$18,200**	140,000 kWh × $0.13 ≈ $18,200

Annual Revenue (with Tiered Pricing and Off-Hours Premium)

Service Type	Fleet Utilization	Rate (USD/day)	Days/Year	Off-Hours Premium	Revenue (USD)
Emergency (public sector, regular)	12% (22 drones)	$200	300	-	$1,320,000

Service Type	Fleet Utilization	Rate (USD/day)	Days/Year	Off-Hours Premium	Revenue (USD)
Emergency (public sector, off-hours)	8% (14 drones)	$200 × 1.5	300	+50%	$1,260,000
Commercial Emergency	10% (18 drones)	$400	300	-	$2,160,000
Commercial Urgent	15% (27 drones)	$200	300	-	$1,620,000
Commercial High Priority	20% (36 drones)	$125	300	-	$1,350,000
Commercial Standard Priority	35% (63 drones)	$75	300	-	$1,417,500
Total Annual Revenue	**100% (180)**				**$9,127,500**

Calculation:

- Emergency (public sector, regular): 22 drones × $200 \times 300 = 1{,}320{,}000$
- Emergency (public sector, off-hours): 14 drones × $300 \times 300 = 1{,}260{,}000$
- Commercial Emergency: 18 drones × $400 \times 300 = 2{,}160{,}000$
- Commercial Urgent: 27 drones × $200 \times 300 = 1{,}620{,}000$
- Commercial High Priority: 36 drones × $125 \times 300 = 1{,}350{,}000$
- Commercial Standard Priority: 63 drones × $75 \times 300 = 1{,}417{,}500$

> Off-hours premium is applied to 40% of emergency jobs (8% of fleet), at a 50% higher rate.

Financial Metrics (5-Year Horizon, Updated)

Metric	Value
Net Present Value (NPV)	$13,820,076 (approx.)
Internal Rate of Return (IRR)	~120% (approx.)
Payback Period	~0.82 years (approx.)

Project Charter: Real-Time Aerial Mapping Service

1. Project Title

Real-Time Aerial Mapping Service (RTAMS)

2. Project Purpose / Justification

This project aims to develop a real-time aerial mapping service using a fleet of drones equipped with high-resolution cameras and sensors. The service will deliver up-to-date, accurate geospatial data for industries such as agriculture, construction, disaster response, and urban planning. The project addresses the limitations of traditional satellite imagery and manned aerial surveys by providing timely, high-resolution data to support faster decision-making and improved operational efficiency.

3. Project Objectives

- Deploy a scalable drone fleet capable of real-time data capture and transmission.
- Develop a secure, cloud-based platform for data processing and visualization.
- Deliver actionable, high-resolution maps to clients via web and API.
- Achieve operational readiness within 12 months.
- Serve at least three target industries in the first year.

4. Project Scope

In Scope:

- Design, build, and deploy 180 drones with required hardware and software.
- Establish mobile command centers and necessary infrastructure.
- Develop cloud-based data processing and visualization tools.
- Create a secure web platform and API for client access.
- Staff recruitment and training for operations, technical, and support roles (including 25 EMSOs for 24/7 coverage).

Out of Scope:

- International expansion (initial focus is domestic market).
- Custom hardware development beyond commercial drone components.

5. Deliverables

- Fully operational drone fleet and mobile command centers.
- Cloud-based data processing and visualization platform.
- Secure web portal and API for client access.
- Documentation, training materials, and support resources.
- 24/7 emergency management support coverage (25 EMSOs).

6. Stakeholders

- Project Sponsor: Prof. Alam
- Project Manager: Yathharthha Kaushal
- Core Team: Operations, Technical, Data, Marketing, Support
- Emergency Management Support Operators (25 for 24/7 coverage)
- Clients: Agriculture, construction, disaster response, urban planning sectors
- Regulatory Authorities: Aviation and data privacy agencies

7. Project Manager & Team Roles

- Project Manager: Oversees project execution and delivery
- Operations Manager: Manages drone fleet and logistics
- Technical Lead: Oversees platform development and integration
- Data Analyst/GIS Specialist: Ensures data quality and analysis
- Marketing & Sales: Client acquisition and relationship management
- Support Staff: Training, documentation, and client support
- Emergency Management Support Operators: Provide 24/7 support for emergency clients

8. Milestones & Timeline

- Project Initiation: Month 0
- Drone Fleet Procurement & Assembly: Months 1–4
- Platform Development: Months 2–8
- Staff Recruitment & Training: Months 3–6
- Pilot Testing: Months 7–9
- Full Deployment: Month 12

9. Budget Summary

- **Capital Costs:** $3,792,344 (drones, command centers, vehicles, equipment)

- **Operational Costs (Annual):** $3,708,675 (maintenance, salaries, cloud, marketing, energy, lease; includes 25 EMSOs)
- **Total First-Year Cost:** $7,501,019
- **Annual Revenue (Projected):** $6,075,000

> **Note:** Emergency services will be billed at a premium during off-hours to offset 24/7 staffing costs.

10. Risks & Mitigation

- **Regulatory Compliance:** Engage with authorities early, ensure all certifications
- **Drone Operation Safety:** Implement robust safety protocols and training
- **Data Privacy:** Use secure data handling and storage practices
- **Market Adoption:** Target multiple industries, offer pilot programs
- **Staffing:** Ensure sufficient EMSO staffing for 24/7 coverage

11. Success Criteria

- Operational drone fleet and platform delivered on time and within budget
- At least three industry clients onboarded in the first year
- Positive client feedback and measurable operational improvements
- Financial metrics (NPV, IRR, payback period) meet or exceed business case
- 24/7 emergency support maintained without service gaps

12. Approval Requirements

- Charter approval by project sponsor and steering committee
- Major deliverables approved by project manager and sponsor

Project Stakeholder Registry

This registry identifies all key stakeholders for the Real-Time Aerial Mapping Service (RTAMS) project, their roles, interests, influence, and engagement strategies.

Stakeholder Name	Role/Title	Interest in Project	Influence/Power	Engagement Strategy
Prof. Alam	Project Sponsor	Successful project delivery, academic standards	High	Regular updates, formal approvals
Yathharthha Kaushal	Project Manager	Project success, team coordination	High	Direct management, weekly meetings
Operations Manager	Team Member	Efficient drone operations, logistics	Medium	Team meetings, status reports
Technical Lead	Team Member	Platform development, technical quality	Medium	Agile sprints, technical reviews
Data Analyst/GIS	Team Member	Data accuracy, analysis quality	Medium	Data review sessions
Marketing & Sales	Team Member	Client acquisition, market fit	Medium	Marketing plans, client feedback
Support Staff	Team Member	Training, documentation, client support	Low	Training sessions, feedback loops
Emergency Clients	End Users (Firefighters, Emergency Responders, etc.)	Access to real-time, high-res mapping for critical response; premium service	High	Demos, direct support, rapid response, premium engagement
Commercial Clients	End Users (Agriculture, Construction, Urban Planning, etc.)	Access to up-to-date, high-res mapping for business operations	Medium	Demos, surveys, support channels
Emergency Management Support Operators (25)	Team Member	Support emergency client operations, ensure 24/7 service quality	Medium	Coordination meetings, training, shift scheduling
Regulatory Authorities	External Stakeholder	Compliance with aviation/data/privacy regulations	High	Early engagement, compliance docs
YorkU Department/Admin	Academic Oversight	Project alignment with university policies	Medium	Reporting, compliance checks

Project Requirements

1. Introduction

The Real-Time Aerial Mapping Service provides rapid, high-resolution aerial imagery and mapping for commercial and emergency clients. The service operates 24/7, with premium pricing for off-hours emergency support, and is staffed to ensure continuous availability.

2. Stakeholder Requirements

- **Commercial Clients:** Require scheduled mapping services, high image quality, timely delivery, and secure data handling.
- **Emergency Clients:** Require immediate response, real-time data streaming, and 24/7 availability, with premium pricing for off-hours.
- **Project Sponsor:** Requires project delivery within scope, budget, and timeline, with clear reporting and risk management.
- **EMSO Team:** Requires robust scheduling, training, and support systems to maintain 24/7 coverage.

3. Functional Requirements

1. **Service Availability**
    - The system must provide 24/7 operational coverage, with at least 5 EMSOs on standby at all times.
    - Emergency requests must be acknowledged within 5 minutes and drone deployment initiated within 15 minutes.
2. **Aerial Data Capture**
    - Drones must capture high-resolution imagery (minimum 4K) and geospatial data.
    - Real-time video streaming must be available for emergency operations.
3. **Data Processing & Delivery**
    - Processed maps and imagery must be delivered to clients within 24 hours for commercial jobs, and within 1 hour for emergency jobs.
    - Data must be securely stored and accessible to authorized users only.
4. **Client Portal**

- Clients must be able to request services, track job status, and access deliverables via a secure web portal.

5. **Tiered Pricing**
    - The system must support standard and premium pricing models, with premium rates applied for off-hours emergency services.

4. Non-Functional Requirements

1. **Reliability**
    - System uptime must be at least 99.5% annually.
    - Redundant systems and backup EMSOs must be in place.
2. **Scalability**
    - The platform must support scaling to additional drones and EMSOs as demand increases.
3. **Security**
    - All client data must be encrypted in transit and at rest.
    - Access controls must be enforced for all users.
4. **Compliance**
    - Operations must comply with all relevant aviation, privacy, and data protection regulations.

5. Staffing & Operations

- Minimum of 25 EMSOs employed to ensure 24/7 coverage (5 per shift, 3 shifts per day, with redundancy).
- Ongoing training and certification for all EMSOs.
- Scheduling system to manage shifts, on-call rotations, and emergency response.

6. Financial & Performance Metrics

- The system must track and report on key financial metrics (NPV, IRR, payback period) as outlined in the business case.
- Service performance (response times, delivery times, uptime) must be monitored and reported monthly.

7. Acceptance Criteria

- All functional and non-functional requirements are met and verified through testing.
- Stakeholder sign-off is obtained for all deliverables.
- The system demonstrates reliable 24/7 operation with premium emergency response capability.

Project Activity List

The following table lists the major activities for the Real-Time Aerial Mapping Service project, using the required template:

Work Package	Activity Name	Duration	Resource Requirement	Assigned to
Project Initiation	Develop project charter	1 week	Project Manager	Project Manager
Project Initiation	Identify and engage stakeholders	1 week	Project Manager, Sponsor	Project Manager
Project Initiation	Define objectives, scope, success criteria	1 week	Project Team	Project Manager
Planning	Develop project management plan	2 weeks	Project Manager, Team Leads	Project Manager
Planning	Define project requirements	1 week	Project Team, Stakeholders	Business Analyst
Planning	Develop stakeholder engagement plan	1 week	Project Manager, Stakeholder Rep	Project Manager
Planning	Prepare risk management plan	1 week	Project Manager, Risk Analyst	Risk Analyst
Planning	Develop communication plan	1 week	Project Manager	Project Manager
Planning	Prepare EMSO staffing & training plan	1 week	HR, Operations Lead	HR Manager
Planning	Develop procurement plan	1 week	Procurement Officer	Procurement Officer
Planning	Establish schedule and milestones	1 week	Project Manager	Project Manager
Planning	Develop financial plan and budget	1 week	Finance Officer	Finance Officer
Execution	Recruit and onboard EMSOs	3 weeks	HR, Operations Lead	HR Manager
Execution	Procure drones, hardware, software	2 weeks	Procurement Officer, IT	Procurement Officer
Execution	Set up operational base & IT infrastructure	2 weeks	IT, Facilities	IT Lead
Execution	Develop and test client portal	4 weeks	IT, Web Developer	IT Lead
Execution	Implement data security & compliance	2 weeks	IT Security, Compliance Officer	IT Security Lead
Execution	Conduct EMSO training & certification	2 weeks	Training Team, EMSOs	Training Lead
Execution	Pilot test drone operations & workflows	2 weeks	Operations, EMSOs	Operations Lead
Execution	Launch marketing & client outreach	2 weeks	Marketing Team	Marketing Lead
Monitoring & Controlling	Monitor progress (schedule, budget)	Ongoing	Project Manager, Team Leads	Project Manager
Monitoring & Controlling	Track/report KPIs	Ongoing	Project Manager, Analyst	Project Manager
Monitoring & Controlling	Manage risks & mitigation	Ongoing	Project Manager, Risk Analyst	Risk Analyst
Monitoring & Controlling	Conduct QA & control checks	Ongoing	QA Team	QA Lead
Monitoring & Controlling	Gather feedback & adjust plans	Ongoing	Project Manager, Stakeholders	Project Manager
Service Launch	Go-live with mapping services	1 week	All Teams	Project Manager
Service Launch	Monitor initial operations	2 weeks	Operations, EMSOs	Operations Lead
Service Launch	Provide ongoing EMSO support/training	Ongoing	Training Team, EMSOs	Training Lead
Project Closure	Obtain sign-off on deliverables	1 week	Project Manager, Sponsor	Project Manager
Project Closure	Post-implementation review	1 week	Project Team, Stakeholders	Project Manager
Project Closure	Finalize documentation & archive records	1 week	Project Manager, Admin	Project Manager
Project Closure	Release resources & close contracts	1 week	Project Manager, HR, Procurement	Project Manager

Work Breakdown Structure (WBS)

Project Details

- **Project Name:** Real-Time Aerial Mapping Service (RTAMS)
- **Project Start Date:** July 1, 2025
- **Project Manager:** Yathharthha Kaushal
- **Client:** Emergency Services Agencies & Commercial Clients (agriculture, construction, land surveying, etc.)
- **Additional Information:**

WBS Hierarchy

WBS Code	Deliverable / Work Package	Description
1.0	Project Management	Overall project planning, monitoring, and control
1.1	Project Charter & Initiation	Develop charter, define objectives, engage stakeholders
1.2	Project Planning	Develop plans for schedule, risk, communication, etc.
1.3	Stakeholder Engagement	Identify, analyze, and manage stakeholders
1.4	Project Monitoring & Reporting	Track progress, report KPIs, manage changes
1.5	Project Closure	Finalize docs, lessons learned, release resources
2.0	Operations & Staffing	Recruit, train, and manage project staff
2.1	EMSO Recruitment & Training	Hire and train Emergency Management Support Operators
2.2	Core Staff Recruitment	Hire and onboard core project staff
2.3	Staff Scheduling & Support	Develop shift schedules, provide ongoing support
3.0	Infrastructure & Procurement	Acquire and set up all physical and digital assets
3.1	Drone Fleet Procurement	Purchase and configure drones and accessories
3.2	Command Trailers & Vehicles	Procure and equip mobile command units
3.3	IT & Cloud Infrastructure	Set up IT systems, cloud services, and security
3.4	Facility Lease & Setup	Lease and prepare storage and office facilities
4.0	System Development	Build and test technical systems and platforms
4.1	Client Portal Development	Design and implement client web portal
4.2	Data Processing & Security	Develop data workflows, ensure compliance
4.3	System Integration & Testing	Integrate all systems, conduct pilot and QA testing
5.0	Service Launch & Operations	Deploy and operate the mapping service
5.1	Marketing & Client Outreach	Launch marketing campaigns, engage clients
5.2	Service Go-Live	Initiate live operations for all service tiers
5.3	Ongoing Support & Maintenance	Provide support, monitor performance, maintain systems

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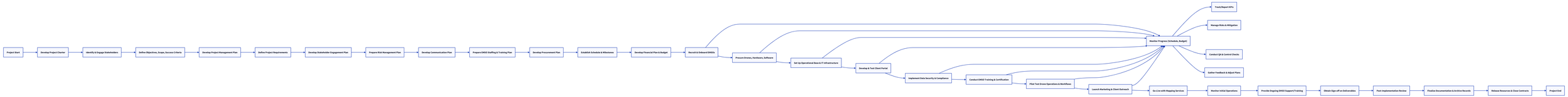
WBS Task List

Level	Task	Assigned To	Start Date	End Date	Notes
1	Project Charter & Initiation	Project Manager	2025-07-01	2025-07-07	Charter approval, stakeholder engagement
1	Project Planning	Project Manager	2025-07-08	2025-07-21	Includes risk, schedule, comms, staffing
2	Stakeholder Engagement	Project Manager	2025-07-08	2025-07-21	Stakeholder analysis, engagement plan
2	Project Monitoring & Reporting	Project Manager	2025-07-22	2025-12-31	Ongoing throughout project
1	Project Closure	Project Manager	2025-12-15	2025-12-31	Final docs, lessons learned
1	EMSO Recruitment & Training	HR Manager	2025-07-15	2025-08-15	Hire/train 25 EMSOs
2	Core Staff Recruitment	HR Manager	2025-07-08	2025-07-21	Hire core team
2	Staff Scheduling & Support	Operations Lead	2025-07-22	2025-12-31	Shift schedules, ongoing support
1	Drone Fleet Procurement	Procurement Officer	2025-07-08	2025-08-15	Purchase/configure 180 drones
2	Command Trailers & Vehicles	Procurement Officer	2025-07-08	2025-08-15	Procure 10 trailers, 10 vehicles
2	IT & Cloud Infrastructure	IT Lead	2025-07-15	2025-08-15	Set up IT, cloud, security
2	Facility Lease & Setup	Admin	2025-07-08	2025-07-31	Lease and prepare facilities
1	Client Portal Development	IT Lead	2025-07-22	2025-09-15	Web portal for clients
2	Data Processing & Security	Data/IT Lead	2025-07-22	2025-09-15	Data workflows, compliance
2	System Integration & Testing	QA Lead	2025-09-16	2025-10-15	Pilot, QA, integration
1	Marketing & Client Outreach	Marketing Lead	2025-08-01	2025-10-01	Launch campaigns, client engagement
1	Service Go-Live	Project Manager	2025-10-16	2025-10-23	Launch all service tiers
1	Ongoing Support & Maintenance	Operations Lead	2025-10-24	2025-12-31	Support, monitor, maintain


Project Start
Develop Project Charter
Identify & Engage Stakeholders
Define Objectives, Scope, Success Criteria
Develop Project Management Plan
Define Project Requirements
Develop Stakeholder Engagement Plan
Prepare Risk Management Plan
Develop Communication Plan
Prepare ERSO Staffing & Training Plan
Develop Procurement Plan
Establish Schedule & Milestones
Develop Financial Plan & Budget
Recruit & Onboard ERSOs
Procure Drones, Hardware, Software
Set Up Operational Base & IT Infrastructure
Develop & Test Client Portal
Implement Data Security & Compliance
Conduct ERSO Training & Certification
Pilot Test Drone Operations & Workflows
Launch Marketing & Client Outreach
Go Live with Mapping Services
Monitor Initial Operations
Provide Ongoing ERSO Support/Training
Obtain Sign-off on Deliverables
Post-Implementation Review
Finalize Documentation & Archive Records
Release Resources & Close Contracts
Project End
Monitor Progress (Schedule, Budget)
Track/Report KPIs
Manage Risks & Mitigation
Conduct QA & Control Checks
Gather Feedback & Adjust Plans

Project Milestone-Based Schedule

This schedule outlines the key milestones for the Real-Time Aerial Mapping Service project, with target dates and responsible parties. Milestones are based on the project charter, WBS, and activity list.

Milestone	Description	Target Date	Responsible
Project Charter Approved	Charter signed by sponsor and stakeholders	2025-07-07	Project Manager
Stakeholder Engagement Plan Complete	Stakeholder analysis and engagement plan ready	2025-07-14	Project Manager
Project Management Plan Approved	All plans (risk, comms, staffing, procurement)	2025-07-21	Project Manager
Core Staff & EMSO Recruitment Complete	All key staff and EMSOs hired and onboarded	2025-08-15	HR Manager
Drone Fleet & Command Units Procured	Drones, trailers, vehicles, IT acquired	2025-08-15	Procurement Officer
Facility Lease & Setup Complete	Storage and office facilities ready	2025-07-31	Admin
IT & Cloud Infrastructure Operational	IT systems, cloud, security in place	2025-08-15	IT Lead
Client Portal MVP Ready	Web portal functional for client access	2025-09-15	IT Lead
Data Processing & Security Complete	Data workflows, compliance implemented	2025-09-15	Data/IT Lead
System Integration & Pilot Testing	All systems integrated, pilot/QA testing done	2025-10-15	QA Lead
Marketing & Client Outreach Launched	Campaigns and client engagement underway	2025-10-01	Marketing Lead
Service Go-Live	All service tiers launched	2025-10-23	Project Manager
Post-Implementation Review	Review and lessons learned documented	2025-12-31	Project Manager
Project Closure & Final Documentation	All docs archived, resources released	2025-12-31	Project Manager

Project Activity-Based Schedule

Global: Project Name

Real-Time Aerial Mapping Service (RTAMS)

Initiation Phase

Activity	Duration	Start Date	End Date
Develop project charter	1 week	2025-07-01	2025-07-07
Identify & engage stakeholders	1 week	2025-07-01	2025-07-07
Define objectives, scope, success criteria	1 week	2025-07-08	2025-07-14

Planning Phase

Activity	Duration	Start Date	End Date
Develop project management plan	2 weeks	2025-07-08	2025-07-21
Define project requirements	1 week	2025-07-08	2025-07-14
Develop stakeholder engagement plan	1 week	2025-07-15	2025-07-21
Prepare risk management plan	1 week	2025-07-15	2025-07-21
Develop communication plan	1 week	2025-07-15	2025-07-21
Prepare EMSO staffing & training plan	1 week	2025-07-15	2025-07-21
Develop procurement plan	1 week	2025-07-15	2025-07-21
Establish schedule and milestones	1 week	2025-07-15	2025-07-21
Develop financial plan and budget	1 week	2025-07-15	2025-07-21

Execution Phase

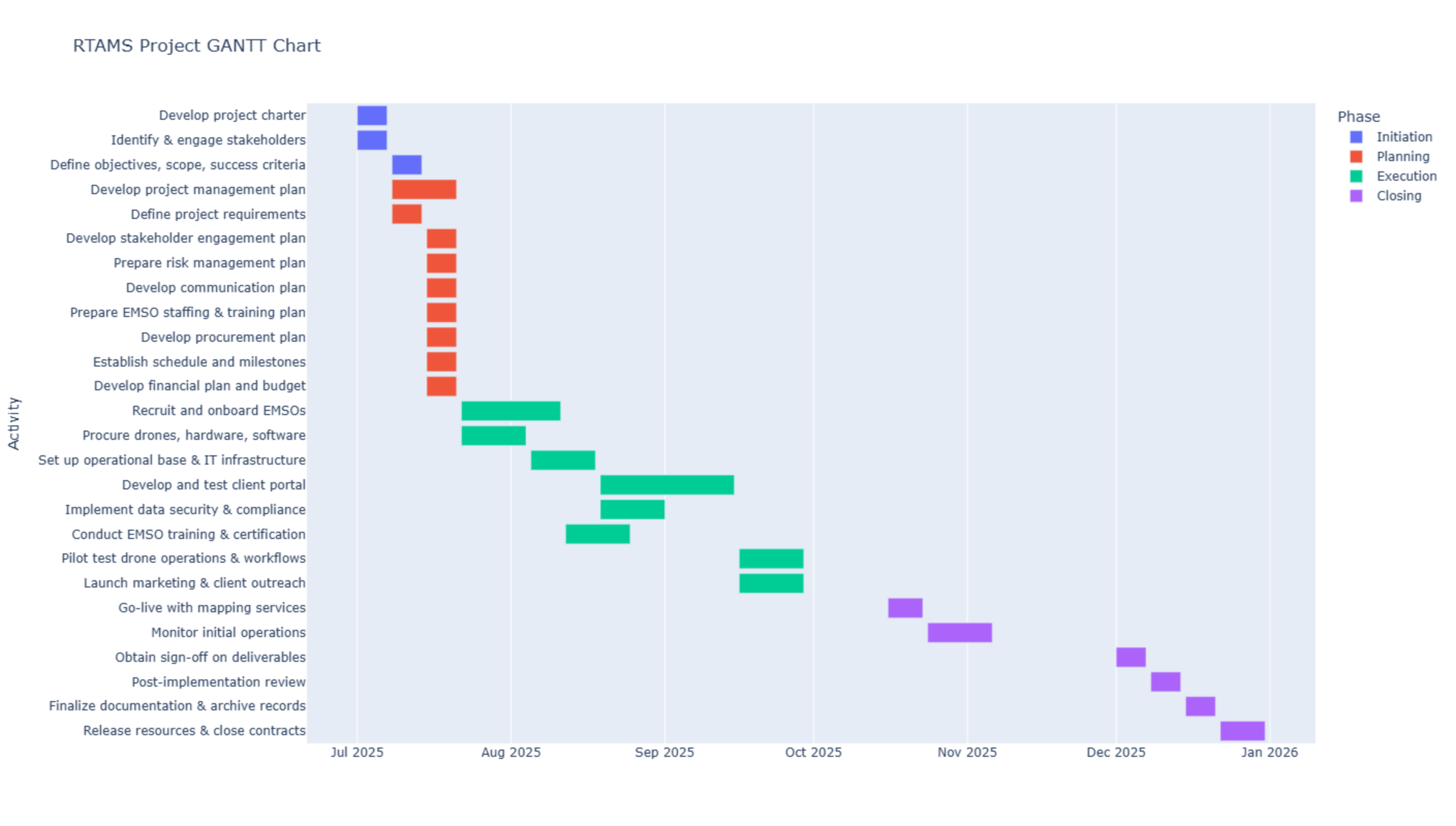
Activity	Duration	Start Date	End Date
Recruit and onboard EMSOs	3 weeks	2025-07-22	2025-08-11
Procure drones, hardware, software	2 weeks	2025-07-22	2025-08-04
Set up operational base & IT infrastructure	2 weeks	2025-08-05	2025-08-18
Develop and test client portal	4 weeks	2025-08-19	2025-09-15
Implement data security & compliance	2 weeks	2025-08-19	2025-09-01
Conduct EMSO training & certification	2 weeks	2025-08-12	2025-08-25
Pilot test drone operations & workflows	2 weeks	2025-09-16	2025-09-29
Launch marketing & client outreach	2 weeks	2025-09-16	2025-09-29

Monitoring & Controlling Phase

Activity	Duration	Start Date	End Date
Monitor progress (schedule, budget)	Ongoing	2025-07-01	2025-12-31
Track/report KPIs	Ongoing	2025-07-01	2025-12-31
Manage risks & mitigation	Ongoing	2025-07-01	2025-12-31
Conduct QA & control checks	Ongoing	2025-07-01	2025-12-31
Gather feedback & adjust plans	Ongoing	2025-07-01	2025-12-31

Closing Phase

Activity	Duration	Start Date	End Date
Go-live with mapping services	1 week	2025-10-16	2025-10-23
Monitor initial operations	2 weeks	2025-10-24	2025-11-06
Provide ongoing EMSO support/training	Ongoing	2025-10-24	2025-12-31
Obtain sign-off on deliverables	1 week	2025-12-01	2025-12-07
Post-implementation review	1 week	2025-12-08	2025-12-14
Finalize documentation & archive records	1 week	2025-12-15	2025-12-21
Release resources & close contracts	1 week	2025-12-22	2025-12-31


RTAMS Project GANTT Chart
Activity
Develop project charter
Identify & engage stakeholders
Define objectives, scope, success criteria
Develop project management plan
Define project requirements
Develop stakeholder engagement plan
Prepare risk management plan
Develop communication plan
Prepare EMSO staffing & training plan
Develop procurement plan
Establish schedule and milestones
Develop financial plan and budget
Recruit and onboard EMSOs
Procure drones, hardware, software
Set up operational base & IT infrastructure
Develop and test client portal
Implement data security & compliance
Conduct EMSO training & certification
Pilot test drone operations & workflows
Launch marketing & client outreach
Go-live with mapping services
Monitor initial operations
Obtain sign-off on deliverables
Post-implementation review
Finalize documentation & archive records
Release resources & close contracts
Jul 2025
Aug 2025
Sep 2025
Oct 2025
Nov 2025
Dec 2025
Jan 2026
Phase
Initiation
Planning
Execution
Closing

Project Human Resource Requirements

This section outlines the human resource requirements for the Real-Time Aerial Mapping Service (RTAMS) project, including roles, number of personnel, key responsibilities, and required timing. The information is based on the project charter, WBS, activity list, and is now fully aligned with the employee salary analysis in the business case.

Role/Position	Number Required	Key Responsibilities	Required Timing
Project Manager	1	Overall project planning, execution, and closure	Entire project
Operations Manager / Team Lead	1	Drone fleet ops, logistics, shift scheduling	Entire project
Technical Lead / Data Systems Manager	1	IT, platform, data systems, integration	Entire project
Data Analyst / GIS Specialist	1	Data analysis, mapping, QA	Planning to closure
Sales & Marketing Specialist	1	Marketing, client outreach, onboarding	Planning to closure
Administrative/Finance Specialist	1	Admin, finance, procurement support	Entire project
Drone Maintenance Technician	2	Drone maintenance, repairs, readiness	Execution to closure
IT Support/Systems Administrator	1	IT setup, maintenance, troubleshooting	Execution to closure
Transport Unit/Drone Operators	10	Drone operation, transport logistics	Execution to closure
Emergency Management Support Operators	25	24/7 drone ops, emergency response, data collection	Execution to closure
Business Analyst	1	Requirements, process analysis, documentation	Planning to closure
Risk Analyst	1	Risk management, mitigation planning	Planning to closure
QA Lead	1	QA planning, testing, control checks	Planning to closure
Training Lead	1	EMSO training, certification, ongoing support	Execution to closure
Marketing Lead	1	Marketing strategy, campaign leadership	Planning to closure
Admin	1	General admin, support	Entire project

Notes:

- EMSOs are scheduled to ensure 24/7 coverage (5 per shift, 3 shifts/day, with redundancy).
- All staff must receive initial and ongoing training as required.
- See the WBS and activity list for detailed timing and assignment of each role.
- This table is now fully consistent with the employee salary analysis in the business case.

Project Roles and Responsibilities

This document outlines the roles and key responsibilities for the Real-Time Aerial Mapping Service (RTAMS) project. Roles are aligned with the project resource requirements and business case.

Role/Position	Key Responsibilities
Project Manager	Overall project planning, execution, monitoring, reporting, stakeholder management, and closure
Operations Manager / Team Lead	Drone fleet operations, logistics, shift scheduling, resource allocation, and operational oversight
Technical Lead / Data Systems Manager	IT and platform architecture, data systems, integration, technical troubleshooting
Data Analyst / GIS Specialist	Data analysis, mapping, QA, reporting, and geospatial data management
Sales & Marketing Specialist	Marketing strategy, client outreach, onboarding, and campaign execution
Administrative/Finance Specialist	Administrative support, finance, procurement, documentation, and record keeping
Drone Maintenance Technician	Drone maintenance, repairs, readiness, and technical support
IT Support/Systems Administrator	IT setup, maintenance, troubleshooting, and user support
Transport Unit/Drone Operators	Drone operation, transport logistics, mission execution
Emergency Management Support Operators	24/7 drone operations, emergency response, data collection, shift work
Business Analyst	Requirements gathering, process analysis, documentation, and business process improvement
Risk Analyst	Risk identification, assessment, mitigation planning, and monitoring
QA Lead	QA planning, system and process testing, control checks, and quality assurance
Training Lead	EMSO training, certification, ongoing support, and training documentation
Marketing Lead	Marketing leadership, campaign planning, brand management
Admin	General administrative support, scheduling, and office management

RCAI Chart: Roles in Key Project Activities

The following RCAI (Responsible, Consulted, Accountable, Informed) chart clarifies the involvement of each role in major RTAMS project activities. This ensures clear governance, communication, and accountability.

Activity / Role	Project Manager	Operations Manager	Technical Lead	Data Analyst	Sales & Marketing Specialist	Admin/Finance Specialist	Drone Maintenance Tech	IT Support	Drone Operators	EMSO	Business Analyst	Risk Analyst	QA Lead	Training Lead	Marketing Lead	Admin
Project Planning & Initiation	A/R	C	C	C	C	C	I	I	I	I	C	C	I	I	I	I
Requirements Gathering	A	C	C	C	I	I	I	I	I	I	R	C	I	I	I	I
System/Platform Design	A	C	R	C	I	I	I	C	I	I	C	C	I	I	I	I
Drone Operations	I	A/R	C	I	I	I	C	I	R	R	I	I	I	I	I	I
Data Analysis & Mapping	I	I	C	R	I	I	I	I	I	I	I	I	C	I	I	I
Marketing & Client Onboarding	I	I	I	I	R	C	I	I	I	I	I	I	I	I	A/R	I
Procurement & Admin	I	I	I	I	I	R/A	I	I	I	I	I	I	I	I	I	R
Risk Management	C	C	C	I	I	I	I	I	I	I	I	R/A	I	I	I	I
QA & Testing	I	I	C	C	I	I	I	I	I	I	I	I	R/A	I	I	I
Training & Certification	I	I	I	I	I	I	I	I	I	I	I	I	I	R/A	I	I
Project Monitoring & Reporting	R/A	C	C	C	I	C	I	I	I	I	C	C	C	I	I	I
Project Closure	R/A	C	C	C	I	C	I	I	I	I	C	C	C	I	I	I

Legend:

- **R** = Responsible (does the work)
- **A** = Accountable (owns the outcome)
- **C** = Consulted (provides input)
- **I** = Informed (kept up to date)

RCAI Chart (Responsible, Consulted, Accountable, Informed)

The following RCAI chart clarifies the involvement of each project role in key project activities:

Activity / Deliverable	Project Manager	Ops Manager	Tech Lead	Data Analyst	Sales/Marketing	Admin/Finance	Drone Maint.	IT Support	Drone Ops	EMSOs	Business Analyst	Risk Analyst	QA Lead	Training Lead	Marketing Lead	Admin
Project Planning & Charter	A/R	C	C	C	C	C	I	I	I	I	C	C	I	I	I	I
Stakeholder Engagement	A/R	C	I	I	C	I	I	I	I	I	C	I	I	I	C	I

Activity / Deliverable	Project Manager	Ops Manager	Tech Lead	Data Analyst	Sales/Marketing	Admin/Finance	Drone Maint.	IT Support	Drone Ops	EMSOs	Business Analyst	Risk Analyst	QA Lead	Training Lead	Marketing Lead	Admin
Requirements Gathering	C	C	C	R	C	I	I	I	I	I	A/R	C	I	I	I	I
Procurement & Asset Acquisition	C	C	C	I	I	R	C	C	I	I	I	I	I	I	I	I
System/Platform Development	C	I	A/R	C	I	I	I	R	I	I	I	I	C	I	I	I
Drone Operations	I	A/R	I	I	I	I	C	C	R	R	I	I	I	I	I	I
Data Analysis & Reporting	I	I	C	A/R	I	I	I	I	I	I	I	I	C	I	I	I
QA & Testing	C	C	C	C	I	I	I	I	I	I	I	I	A/R	I	I	I
Risk Management	C	I	I	I	I	I	I	I	I	I	I	A/R	I	I	I	I
Training & Certification	I	C	I	I	I	I	I	I	I	I	I	I	I	A/R	I	I
Marketing & Client Outreach	C	I	I	I	A/R	I	I	I	I	I	I	I	I	I	A/R	I
Documentation & Reporting	A/R	C	C	C	C	R	I	I	I	I	C	C	C	I	C	R
Project Closure	A/R	C	I	I	I	C	I	I	I	I	C	C	C	I	I	R

Legend:

- **R** = Responsible (does the work)
- **A** = Accountable (owns the outcome)
- **C** = Consulted (provides input)
- **I** = Informed (kept up to date)

Project Quality Management Plan

This Quality Management Plan outlines the standards, processes, and responsibilities for ensuring quality throughout the Real-Time Aerial Mapping Service (RTAMS) project.

1. Quality Standards

The RTAMS project will adhere to the following quality standards:

Category	Standard/Reference	Description
Data Accuracy	ISO 19157, Internal QA Protocols	Geospatial data must meet accuracy and completeness requirements
System Reliability	ISO/IEC 25010, Uptime > 99%	Platform and drone systems must be highly available and reliable
Safety & Compliance	Transport Canada UAV Regulations, CSA	All operations must comply with aviation and safety regulations
Information Security	ISO/IEC 27001, Internal IT Policies	Data must be protected against unauthorized access and breaches
Customer Satisfaction	Client Feedback, Service SLAs	Service must meet or exceed client expectations and SLAs
Documentation	PMBOK, Internal Templates	All deliverables must be documented and reviewed

2. Quality Assurance (QA)

Quality assurance is a proactive process to ensure project deliverables and processes meet defined standards. QA activities for RTAMS include:

- **Process Audits:** Regular audits of project processes, documentation, and compliance with standards.
- **Peer Reviews:** Scheduled reviews of technical deliverables (data, code, reports) by qualified team members.
- **Training:** Ongoing training for staff on quality standards, safety, and best practices.
- **Supplier/Partner Evaluation:** Assessment of third-party vendors and partners for compliance with quality requirements.

How QA Will Be Performed

- QA Lead will develop and maintain a QA plan and schedule audits and reviews.
- Peer reviews will be documented, and findings tracked to closure.
- Training sessions will be logged, and attendance tracked.
- Non-conformities will be recorded and corrective actions assigned.

3. Quality Control (QC)

Quality control is the process of inspecting and testing deliverables to ensure they meet requirements. QC activities for RTAMS include:

- **Data Validation:** Automated and manual checks for data accuracy, completeness, and format.
- **System Testing:** Functional, integration, and user acceptance testing of the RTAMS platform and drone systems.
- **Operational Checks:** Pre-flight and post-flight checklists for drones and equipment.
- **Client Acceptance:** Formal sign-off by clients on deliverables and services.

How QC Will Be Performed

- Data Analyst/GIS Specialist will perform data validation and report issues.
- Technical Lead will oversee system and integration testing.
- Operations Manager will ensure operational checklists are completed for each mission.
- QA Lead will coordinate client acceptance and maintain QC records.

4. Quality Roles and Responsibilities

Role/Position	Quality Responsibilities
QA Lead	Develops QA plan, leads audits/reviews, tracks non-conformities, reports to PM
Project Manager	Accountable for overall quality, ensures QA/QC processes are followed
Technical Lead / Data Systems Manager	Oversees technical QA/QC, system testing, and integration reviews
Data Analyst / GIS Specialist	Performs data validation, QA checks, and reporting
Operations Manager / Team Lead	Ensures operational quality, safety, and compliance
Drone Maintenance Technician	Conducts equipment QC, maintenance, and readiness checks
Admin/Finance Specialist	Maintains quality records, supports documentation audits

Role/Position	Quality Responsibilities
All Team Members	Participate in QA/QC activities, report issues, and follow quality procedures

5. Continuous Improvement

- Lessons learned will be captured at each phase and reviewed at project closure.
- Quality metrics will be tracked and reported to support ongoing improvement.

Project Risk Register

Project Name: Real-Time Aerial Mapping Service (RTAMS)

#	Risk Name	Risk Description	Probability Factor	Impact Factor	Risk Score
1	Drone Hardware Failure	Drone hardware may fail during mission, causing delays.	Possible (0.5)	Critical (10)	5.0
	Response Type: Mitigate	*Response Plan:* Preventive maintenance, pre-flight checks, spare units.	*Contingency Plan:* Deploy backup drone, reschedule mission.		
2	Data Inaccuracy or Loss	Collected data may be inaccurate or lost due to system error.	Unlikely (0.2)	Critical (10)	2.0
	Response Type: Mitigate	*Response Plan:* Automated backups, validation scripts, QA reviews.	*Contingency Plan:* Data recovery procedures, re-collection.		
3	Regulatory Non-Compliance	Operations may violate UAV regulations, risking penalties.	Unlikely (0.2)	Critical (10)	2.0
	Response Type: Avoid	*Response Plan:* Staff training, compliance audits, regular review of regulations.	*Contingency Plan:* Immediate corrective action, legal consultation.		
4	Cybersecurity Breach	Unauthorized access to systems or data breach.	Unlikely (0.2)	Critical (10)	2.0
	Response Type: Mitigate	*Response Plan:* Firewalls, access controls, regular security audits.	*Contingency Plan:* Incident response plan, notify authorities.		
5	Adverse Weather	Weather disrupts drone operations and data collection.	Possible (0.5)	Severe (8)	4.0
	Response Type: Transfer	*Response Plan:* Weather monitoring, flexible scheduling, contingency plans.	*Contingency Plan:* Reschedule operations, insurance claim.		
6	Key Staff Turnover	Loss of key personnel impacts project continuity.	Unlikely (0.2)	Severe (8)	1.6
	Response Type: Mitigate	*Response Plan:* Cross-training, knowledge management, retention incentives.	*Contingency Plan:* Recruit replacements, adjust schedule.		
7	Client Dissatisfaction	Client is dissatisfied with deliverables or service.	Unlikely (0.2)	Critical (10)	2.0
	Response Type: Mitigate	*Response Plan:* Clear requirements, regular updates, client sign-off.	*Contingency Plan:* Rework deliverables, client engagement.		
8	Supplier/Partner Delays	Delays from suppliers or partners affect project schedule.	Possible (0.5)	Moderate (5)	2.5
	Response Type: Transfer	*Response Plan:* Multiple suppliers, contract SLAs, regular follow-up.	*Contingency Plan:* Use alternate suppliers, adjust timeline.		
9	Budget Overrun	Project costs exceed budgeted amounts.	Unlikely (0.2)	Critical (10)	2.0
	Response Type: Mitigate	*Response Plan:* Regular budget reviews, contingency reserves, cost tracking.	*Contingency Plan:* Reduce scope, seek additional funding.		
10	Data Privacy Violation	Breach of data privacy regulations or client data.	Unlikely (0.2)	Critical (10)	2.0
	Response Type: Mitigate	*Response Plan:* Data anonymization, compliance checks, staff training.	*Contingency Plan:* Notify affected parties, legal response.		
11	Drone Loss or Theft	Drone is lost or stolen during operations.	Unlikely (0.2)	Severe (8)	1.6
	Response Type: Transfer	*Response Plan:* GPS tracking, secure storage, insurance.	*Contingency Plan:* File insurance claim, deploy backup.		
12	QA Process Gaps	Gaps in QA process lead to undetected errors.	Unlikely (0.2)	Severe (8)	1.6
	Response Type: Mitigate	*Response Plan:* QA plan, audits, corrective actions.	*Contingency Plan:* Additional QA review, process update.		
13	Inadequate EMSO Training	EMSO staff lack adequate training for emergency response.	Unlikely (0.2)	Severe (8)	1.6
	Response Type: Mitigate	*Response Plan:* Training program, certification, ongoing support.	*Contingency Plan:* Refresher training, reassign duties.		
14	IT System Downtime	IT systems are unavailable, disrupting operations.	Unlikely (0.2)	Critical (10)	2.0
	Response Type: Mitigate	*Response Plan:* Redundant systems, monitoring, rapid response.	*Contingency Plan:* Manual processes, escalate to IT support.		
15	Negative Media/Public Perception	Negative publicity impacts project reputation.	Unlikely (0.2)	Moderate (5)	1.0
	Response Type: Mitigate	*Response Plan:* Proactive communication, media monitoring, crisis plan.	*Contingency Plan:* Public statement, engage PR support.		

Legend:

- **Probability Factor:** Likely (0.8), Possible (0.5), Unlikely (0.2)
- **Impact Factor:** Critical (10), Severe (8), Moderate (5), Low (2)
- **Risk Score:** Probability Factor × Impact Factor

This register will be reviewed and updated regularly throughout the project lifecycle.

Project Cost Estimation

Project Name: Real-Time Aerial Mapping Service (RTAMS)

This document provides a detailed cost estimation for the RTAMS project, based directly on the Project Business Case. All costs, quantities, and sources are referenced for transparency and traceability.

Capital Costs Breakdown

Item	Quantity / Details	Unit Cost (USD)	Total Cost (USD)	Source/Notes
Drone Manufacturing	180 units	$790.80	$142,344	Includes battery, camera, frame, electronics (see below)
Mobile Command Trailers	10	$275,000	$2,750,000	Base Trailer + Modifications
Tow Vehicles	10	$60,000	$600,000	Ford F-150 XLT or similar
Mobile Command Centers	5	$40,000	$200,000	
Maintenance Tools, Spare Parts, IT, Security	Lump sum		$100,000	Estimate
Total Capital Cost			**$3,792,344**	

Drone Manufacturing Includes:

- Battery Packs (4 per drone, 48 cells total): $196.80
- 4K Camera (e-CAM82_USB): $94.00
- Carbon Fiber Frame, Motors, ESCs, Flight Controller, GPS, Telemetry, PDB, Wiring: $500.00

Operational Costs (Annual)

Item	Quantity / Details	Unit Cost (USD)	Total Cost (USD)	Source/Notes
Drone Maintenance	Annual		$90,000	Estimate
Staff Salaries	50 FTE		$3,725,000	See breakdown below
Cloud Services	Annual		$100,000	AWS estimate
Marketing & Customer Acquisition	Annual		$50,000	Estimate
Miscellaneous	Annual		$25,000	Estimate
Energy Consumption (180 drones)	Annual		$18,200	140,000 kWh × $0.13/kWh
Facility Lease (Storage & Office)	Annual		$475,475	Toronto industrial lease
Total Operational Cost			**$4,483,675**	

Staff Salaries Breakdown

Position/Role	Number of Employees	Salary per Employee (USD, Annual)	Total Salary (USD)
Operations Manager / Team Lead	1	$100,000	$100,000
Technical Lead / Data Systems Manager	1	$85,000	$85,000
Data Analyst / GIS Specialist	1	$70,000	$70,000
Sales & Marketing Specialist	1	$70,000	$70,000
Administrative/Finance Specialist	1	$55,000	$55,000
Drone Maintenance Technician	2	$65,000	$130,000
IT Support/Systems Administrator	1	$90,000	$90,000
Transport Unit/Drone Operators	10	$70,000	$700,000
Emergency Management Support Operators	25	$75,000	$1,875,000
Business Analyst	1	$80,000	$80,000
Risk Analyst	1	$80,000	$80,000
QA Lead	1	$80,000	$80,000
Training Lead	1	$75,000	$75,000
Marketing Lead	1	$80,000	$80,000

Position/Role	Number of Employees	Salary per Employee (USD, Annual)	Total Salary (USD)
Admin	1	$55,000	$55,000
Grand Total	**50**		**$3,725,000**

Energy Cost Calculation

Parameter	Value	Calculation/Notes
Cells per Battery Pack	12 cells	Sony Murata VTC6 18650 in series
Nominal Voltage per Cell	3.6 V	Typical for Sony Murata VTC6
Capacity per Cell	3000 mAh (3 Ah)	
Nominal Energy per Cell	~10.8 Wh	3.6 V × 3 Ah
Nominal Energy per Battery Pack	129.6 Wh	12 × 10.8 Wh
Battery Packs Used per Day per Drone	20	Full capacity operation
Daily Energy Consumption per Drone	2.592 kWh	20 × 129.6 Wh = 2592 Wh = 2.592 kWh
Operating Days per Year	300 days	Assumed operation days per year
Annual Energy Consumption per Drone	777.6 kWh	2.592 kWh/day × 300 days = 777.6 kWh
Number of Drones	180	
Total Annual Energy Consumption	~140,000 kWh	777.6 kWh × 180 ≈ 139,968 kWh (~140,000 kWh)
Electricity Rate	$0.13 per kWh	
Annual Energy Cost	**~$18,200**	140,000 kWh × $0.13 \approx$18,200

All costs are in US Dollars (USD) unless otherwise noted. For full context and rationale, see the Project Business Case.

Project Detailed Budget

Project: Real-Time Aerial Mapping Service (RTAMS)

The following table presents a detailed budget for the RTAMS project, structured by cost category and period. The budget is based on the cost and benefit analysis from the Project Cost Estimation and Project Business Case documents.

	Year 1 (Startup)	Year 2	Year 3
HR Costs			
Operations Manager	$100,000	$100,000	$100,000
Technical Lead	$85,000	$85,000	$85,000
Data Analyst / GIS	$70,000	$70,000	$70,000
Sales & Marketing	$70,000	$70,000	$70,000
Admin/Finance	$55,000	$55,000	$55,000
Drone Maintenance Tech	$130,000	$130,000	$130,000
IT Support	$90,000	$90,000	$90,000
Drone Operators	$700,000	$700,000	$700,000
Emergency Support Ops	$1,875,000	$1,875,000	$1,875,000
Business Analyst	$80,000	$80,000	$80,000
Risk Analyst	$80,000	$80,000	$80,000
QA Lead	$80,000	$80,000	$80,000
Training Lead	$75,000	$75,000	$75,000
Marketing Lead	$80,000	$80,000	$80,000
Admin	$55,000	$55,000	$55,000
Total HR Costs	**$3,725,000**	**$3,725,000**	**$3,725,000**
Other Costs			
Drone Manufacturing	$142,344	-	-
Mobile Command Trailers	$2,750,000	-	-
Tow Vehicles	$600,000	-	-
Mobile Command Centers	$200,000	-	-
Maintenance/IT/Parts	$100,000	$100,000	$100,000
Drone Maintenance	$90,000	$90,000	$90,000
Cloud Services	$100,000	$100,000	$100,000
Marketing/Acquisition	$50,000	$50,000	$50,000
Miscellaneous	$25,000	$25,000	$25,000
Energy Consumption	$18,200	$18,200	$18,200
Facility Lease	$475,475	$475,475	$475,475
Total Other Costs	**$4,650,019**	**$858,675**	**$858,675**
Total Planned Costs	**$8,375,019**	**$4,583,675**	**$4,583,675**

Project Communications Plan

This communications plan outlines the key communication activities, their purposes, mediums, frequency, and intended audiences for the Real-Time Aerial Mapping Service (RTAMS) project.

Item	Purpose	Medium	Frequency	Audience
Kickoff Meeting	Introduce project, convey goals, roles, and expectations	In person / Video Conference	Once (Project Start)	Project Team, Project Sponsor, Key Stakeholders
Project Team Meetings	Review project status, discuss issues, assign tasks	In person / Video Conference	Weekly	Project Team
Project Status Updates	Provide progress updates, highlight risks and achievements	Email / Project Portal	Bi-weekly	Project Sponsor, Stakeholders, Team
Steering Committee Meetings	Strategic oversight, decision-making, resolve escalated issues	In person / Video Conference	Monthly	Project Sponsor, Senior Management, PM
Technical Review Sessions	Review technical progress, address technical challenges	In person / Video Conference	As needed	Technical Team, Subject Matter Experts
Stakeholder Briefings	Inform external stakeholders of progress and key milestones	Email / Newsletter / Webinar	Quarterly	External Stakeholders, Partners, Clients
Change Control Meetings	Review and approve/reject change requests	In person / Video Conference	As needed	Change Control Board, Project Manager
Risk Review Meetings	Identify and assess project risks, mitigation planning	In person / Video Conference	Monthly	Project Team, Risk Manager, Sponsor
Lessons Learned Sessions	Capture and share lessons for continuous improvement	In person / Video Conference	End of Major Phases	Project Team, Sponsor
Project Closure Meeting	Review project outcomes, confirm deliverables, close project	In person / Video Conference	Once (Project End)	Project Team, Sponsor, Stakeholders

Project Status Report

- **Project Name**: Real-Time Aerial Mapping Service (RTAMS)
- **For Week Ending**: June 21, 2025
- **Project Status**: Green
- **Status Description**: The project is in the initiation phase and is about to begin. No activities have been completed yet, as the project work has not started. The team is prepared and all foundational planning documents are ready. No issues or risks have been encountered at this stage. The project is on track to proceed as scheduled.
- **Activities During the Past Week**:
  - None. The project is academic / not "really" deployable at this scale for just an academic project.
- **Activities Planned for the Next Week**:
  - Conduct project kickoff meeting
  - Begin detailed project planning and scheduling
  - Assign initial roles and responsibilities
  - Set up project communication channels
- **Project Issues**:
  - None at this stage
- **Project Changes**:
  - None at this stage