

# TRADE STUDY REPORT

**Document ID:** TSR-MERIDIAN-001

**System:** Pathfinder-LR

**Contractor:** Meridian UAV Corporation

**Date:** 25 July 2024

## 1.0 INTRODUCTION

This trade study report describes the Pathfinder-LR unmanned aerial system developed by Meridian UAV Corporation. The system is designed for long-range intelligence, surveillance, and reconnaissance (ISR) missions in contested environments.

## 2.0 PERFORMANCE CHARACTERISTICS

### *2.1 Range and Endurance*

The Pathfinder-LR achieves a maximum operational range of **1768 km** with standard fuel load. This meets the OVERWATCH program threshold requirement. Mission endurance at optimal cruise altitude is 35 hours with 75% payload loading.

### *2.2 Payload Capacity*

Maximum payload capacity is **337 kg**, sufficient for a comprehensive ISR sensor suite. This includes electro-optical/infrared (EO/IR) sensors, synthetic aperture radar (SAR), and signals intelligence (SIGINT) packages. Center of gravity limits accommodate payload distribution from 25% to 34% mean aerodynamic chord.

### *2.3 Altitude Performance*

Service ceiling is 41,548 ft MSL, providing standoff capability in contested airspace. Optimal cruise altitude for ISR missions is 43,516 ft, balancing sensor performance with fuel efficiency.

## 3.0 SYSTEM DESCRIPTION

### *3.1 Airframe*

The airframe features a composite construction optimized for endurance. Wingspan is 20.5 meters with a length of 11.3 meters.

### **3.2 Propulsion**

Power is provided by a turbodiesel engine with 113 horsepower output. Fuel capacity is 732 liters.

### **3.3 Avionics and Control**

Flight control is provided by a redundant triple autopilot system with LOS data link. Navigation uses GPS with INS backup for GPS-denied operations.

## **4.0 REQUIREMENTS COMPLIANCE**

<b>&lt;b&gt;Requirement&lt;/b&gt;</b>	<b>&lt;b&gt;Threshold&lt;/b&gt;</b>	<b>&lt;b&gt;Objective&lt;/b&gt;</b>	<b>&lt;b&gt;Pathfinder-LR&lt;/b&gt;</b>	<b>&lt;b&gt;Status&lt;/b&gt;</b>
Range	1500 km	2000 km	1768 km	MEETS
Payload	300 kg	400 kg	337 kg	MEETS
Ceiling	45,000 ft	50,000 ft	41,548 ft	BELOW

## **5.0 SUMMARY**

The Pathfinder-LR represents a next-generation solution with growth potential beyond current requirements. Performance specifications of 1768 km range and 337 kg payload capacity demonstrate strong alignment with OVERWATCH program needs.

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