



MEDICAL DRONE DELIVERY PILOT PROJECT

SPRING 2025
PROJECT REPORT

Contents

1. Cover
2. Table of Contents
3. Introduction
4. Executive Summary
5. Background & Purpose
6. Flight Operations
8. Technology & Equipment
9. Conclusion &
Strategic Outlook



Introduction

Advanced Air Mobility is taking off in northern Michigan.

The Munson Healthcare drone delivery pilot program represents a significant milestone in the application of Advanced Air Mobility (AAM) technology for medical logistics in rural Michigan.

The pilot program was executed through a collaborative partnership between Munson Healthcare, DroneUp, blueflite, Traverse Connect, and the Central Michigan University (CMU) Rural Health Excellence Institute (RHEI), funded by Michigan's Office of Future Mobility and Electrification (OFME) and the Michigan Department of Transportation (MDOT). Newlab provided additional support for the project.

PROJECT PARTNERS



SUPPORTED BY



WITH ADDITIONAL SUPPORT FROM

Newlab



Photo credit: Jan-Michael Stump, Traverse City Record-Eagle



Executive Summary

The first phase of the Munson Medical Drone Delivery pilot project was successful. Initial pilot flights were conducted between May 9-20, 2025, completing 67 total flights with a 91% success rate. Critical data from the pilot flights provided insights to inform the future deployment of drone-based medical delivery systems.

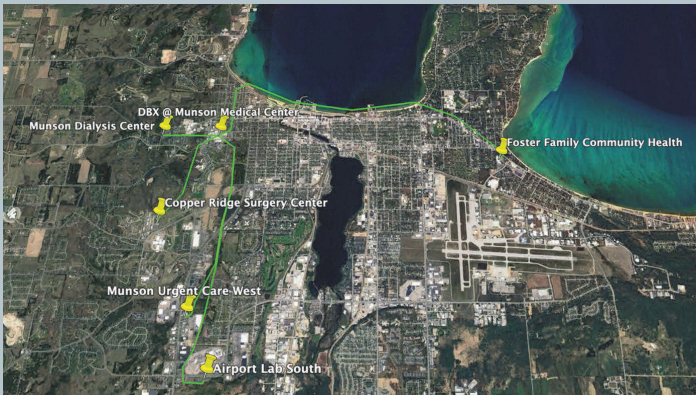
One notable positive outcome was the consistent and reliable maintenance of payload temperature for medical samples. Across all flights where temperature was monitored, the payload environment was maintained at an average of 17.3 °C, well within the required range for clinical laboratory specimens such as Complete Blood Counts and Comprehensive Metabolic Panels, thus validating a core component of the clinical use case.

The program's primary objective of the initial pilot phase was to evaluate the feasibility of using uncrewed aerial systems (UAS) for transporting patient laboratory samples between Munson Healthcare facilities within a controlled Visual Line of Sight (VLOS) operational framework. Operating within a one-mile radius of Munson Medical Center in Traverse City, the pilot project demonstrated significant potential for transforming healthcare logistics while identifying key operational challenges and regulatory requirements that must be addressed for scaling to broader implementation.

Flight Operations

Phase 1 operations were deliberately structured to begin with simple, short-distance flights between a limited number of medical facilities to establish baseline operational parameters, safety protocols, and determine feasibility. The pilot program focused exclusively on VLOS operations, requiring three to four visual observers to monitor ground and air risk while pilots in control maintained visual contact with the aircraft throughout each flight. This operational constraint was implemented to ensure

Phase 1 operations were conducted between three primary locations within Munson Healthcare's Traverse City network: Munson Medical Center with bidirectional flights connecting it to both the Munson Dialysis Center and Copper Ridge Surgery Center. These locations were selected based on their operational significance within the healthcare system, proximity for visual line-of-sight operations, and potential for demonstrating measurable improvements in logistics efficiency.



compliance with Federal Aviation Administration (FAA) 14 CFR Part 107 regulations while gathering data to support future Beyond Visual Line of Sight (BVLOS) operations under 14 CFR Part 135.

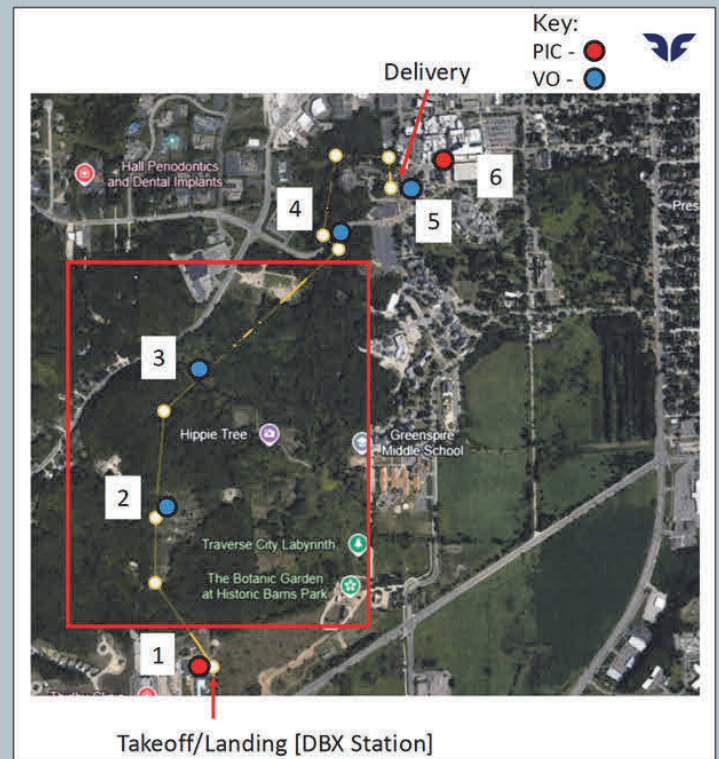
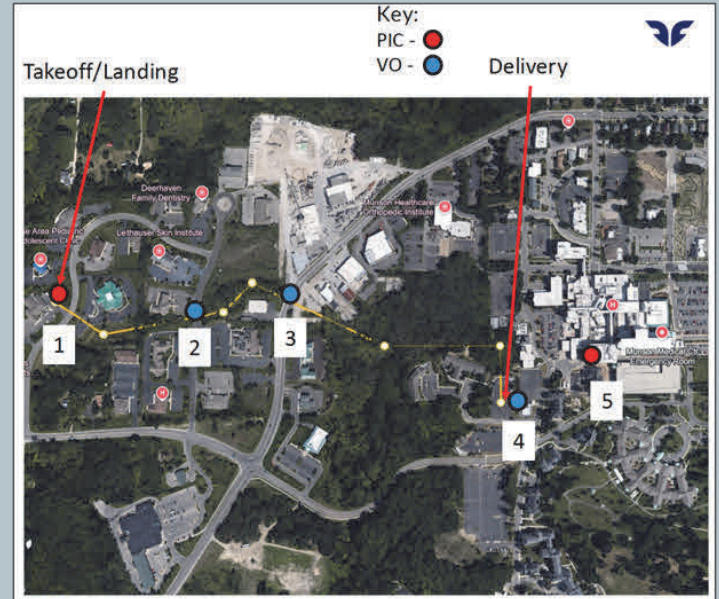
Phase 1 began with simulated deliveries of laboratory samples, using water bottles and temperature monitoring equipment to replicate the handling characteristics and environmental requirements of actual patient laboratory samples. The pilot project successfully transitioned to transporting actual patient laboratory samples once transportation requirements were validated through these simulations.

Munson Medical Center served as the central depot, the launch point, and the center of flight operations. It also houses the main laboratory facilities serving as the distribution hub for the broader healthcare network. The facility's location in central Traverse City provided optimal positioning for radiating flights to satellite facilities while maintaining compliance with FAA airspace requirements and local aviation safety protocols.

The Munson Dialysis Center, located on West Royal Drive, represented the shortest flight distance at approximately 1,000-1,030 meters from the Medical Center. This route became the most frequently utilized during testing operations, accounting for 55 of the 67 total flights. The relatively short distance allowed for multiple flights per hour while providing valuable data on high-frequency operations, battery management, and operational workflow optimization.

Copper Ridge Surgery Center, located in Garfield Township, represented the longest flight distance at approximately 2,200-2,244 meters from Munson Medical Center. This route provided critical data on longer-range operations within VLOS constraints, requiring additional ground observers and more complex coordination protocols.

The Phase 1 pilot program achieved a 91% overall success rate, with 61 successful flights out of 67 total flight attempts. This success rate demonstrates the feasibility of drone technology for medical logistics applications under controlled operational conditions. The six unsuccessful flights were attributed to specific technical issues: three winch-related failures, one GPS malfunction, and two cellular connectivity problems that triggered automatic return-to-launch protocols.



Technology and Equipment

The pilot program utilized advanced drone technology provided by blueflite, a Michigan-based manufacturer, integrated with winch delivery and automated ground infrastructure developed by DroneUp. The aircraft features specialized winch systems for precision cargo delivery, automated landing capabilities, and temperature monitoring systems designed specifically for medical logistics applications. Flight control systems incorporated GPS waypoint navigation, crewed aircraft detection technology, and real-time communication systems for coordination with ground personnel.



Conclusion and Strategic Outlook

The drone delivery pilot project has demonstrated the viability and potential benefits of UAS technology for medical logistics in rural healthcare settings. With a 91% mission success rate and documented efficiency improvements, Phase 1 operations provide compelling evidence for the continued development and implementation of drone-based healthcare delivery systems.

Scheduled to begin in 2026, Phase 2, BVLOS operations represents a critical advancement that will address some of the scalability constraints identified in Phase 1. Phase 2 will be immediately followed by the continued expansion with Phase 3 BVLOS multi-mission operations, which holds promise for transforming healthcare delivery across rural Michigan. The challenges identified during Phase 1 provide clear priorities for future enhancements.

By dramatically reducing specimen transport, drone logistics can accelerate clinical decision-making and improve adherence to time-sensitive therapeutic protocols, particularly for chronic conditions requiring frequent monitoring. Patient satisfaction is expected to increase substantially as drone delivery decreases turnaround time for laboratory results. Systematic clinical data collection in future project phases is essential to confirm these anticipated benefits.

The success of the Munson Healthcare drone delivery pilot program demonstrates that AAM technology is not merely a futuristic concept, but a practical solution ready for implementation in addressing real-world healthcare challenges. With continued development, regulatory advancement, and strategic investment, drone-based medical logistics systems have the potential to significantly improve healthcare delivery, efficiency, and outcomes for rural communities across Michigan and beyond.