

DARPA Lift Challenge 2026: Competitor's Guide



To help potential competitors prepare, this guide will walk you through everything from the technical requirements and course layout to what you can expect on competition day.

Safety and Sportsmanship

Before diving into the details, it's important to cover the basics. All participants must follow the procedures presented here, along with all standard FAA rules and safety practices. It cannot be stressed enough: safety is the number one priority. Any behavior seen as unsafe, or any violation of the rules, could lead to disqualification. The goal is for this to be a challenging and rewarding experience, so everyone is expected to compete with sportsmanship and in good faith.

Your Aircraft and Crew

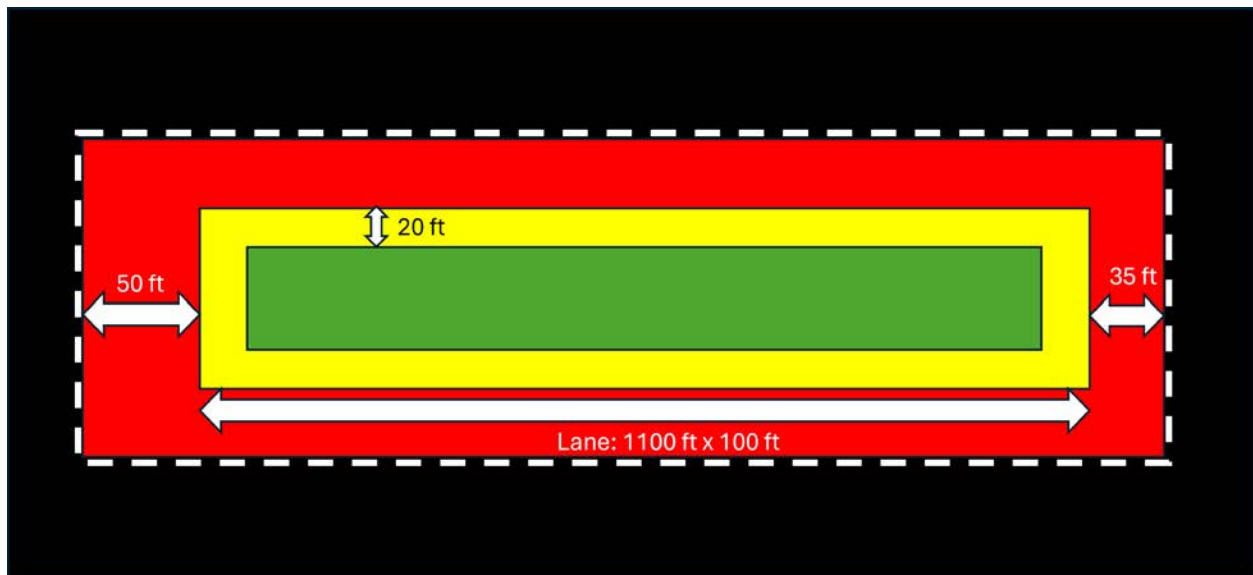
This Challenge is designed for Vertical Takeoff and Landing (VTOL) vehicles, meaning your unmanned aircraft system (UAS) must be able to lift off and land vertically without a runway or external launch gear.

Your flight crew is also critical. Each team needs to designate one Remote Pilot in Command (RPIC) who holds a valid FAA Part 107 certificate. These certifications will be reviewed by DARPA beforehand and physically verified by the lane coordinator on competition day. The RPIC can also have one assistant with them in the designated competition area.

On top of that, all flight operations must follow standard FAA regulations. For larger systems over 55 lbs., this includes having an exemption on file. We are currently working with the FAA to have DARPA hold the exemption, which will be distributed to teams that have applied to compete. The aircraft must also be equipped with and compliant with all FAA Remote Identification (RID) regulations.

The Competition Course

Each team gets an exclusive 100-foot-wide flight lane for all its flight window operations. For safety, each lane is enclosed by a digital geofence. Think of your flight lane as having a "stoplight" system to keep you on track.



This graphic shows Lift Challenge lane boundaries as described in The Competition Course Section. Source: DARPA

The center of the lane is your Green Zone, a 60-foot-wide safety corridor. As long as you're flying here, everything is nominal and you're on the optimal path. Drifting toward the edges of the lane will push you into the Yellow Zone, a 20-foot buffer that serves as a warning track. Entering this area won't penalize you, but it will trigger a visual warning on the RPIC's display, letting you know you're getting close to the boundary.

If you stray further and cross into the Red Zone — the area just outside the flight lane — your scoring attempt for that run is immediately over. This constitutes a boundary excursion, and your required action is to safely pilot the aircraft back into the lane and return to the starting line. If you have mission time left, your team can refuel, re-weigh, and begin a new attempt.

The most critical boundary is the Black Zone, which begins the moment your aircraft breaches the site's overall geofence perimeter. A geofence breach is a serious safety event that triggers a mandatory emergency protocol. Your immediate and primary responsibility as the pilot is to try and guide the aircraft back inside the flight box. If the aircraft is unresponsive, you must land it immediately, wherever it is. And if you can't land it and it continues to travel away from the operational area, you must activate the kill switch as a final resort to ensure site containment.

At the end of your lane are two key zones. First, a Preparation Box serves as a staging area to run final checks on your UAS. From there, you'll move into the Competition Box, the official zone where all takeoffs, landings, and payload deposits happen. Only three people are allowed in the Competition Box during a flight: the RPIC, the optional RPIC assistant, and the official Lane Coordinator. Inside this box, you'll see two marked circles on the ground, each with a 5-foot radius: one for your UAS Takeoff and Landing and one for the Payload Deposit.

The Payload

The payload is specific: Barbell Standard brand cast iron Olympic plates, which will be provided by DARPA to ensure consistency. To get a qualifying score, a flight must carry a minimum of 110 lbs. You'll need to declare your payload weight before the weigh-in, and when assembling your payload, the rule is to use the largest plate denominations possible. The plates themselves cannot be modified in any way.

How you attach the payload is up to you, but the mechanism must be secure and safe. It's important to know that the weight of your attachment system counts as part of the aircraft's weight, not as part of the payload weight. The attachment gear must also stay on the aircraft for the entire flight. Lastly, all plates must be held at a single point on the UAS; spreading the weight out is not allowed.

Competition Day: Scheduling and Check-In

So, how is flight time assigned? It's simple: the sooner you apply, the higher you are on the list to pick your preferred flight days.

Each team is assigned two 90-minute flight windows on separate days, one in the morning and one in the afternoon. This gives you several chances to post your best score. During your 90-minute block, you can make as many flight attempts as you can safely fit in. Your best score overall from either of your two windows will stand as your official score.

The schedule could change due to unforeseen events. Every effort will be made to accommodate teams and provide notice if things get shuffled. It's crucial to be on time—check-in with the lane coordinator is required within 15 minutes of your window's start time. Missing a window may mean forfeiting those attempts. If you have a valid reason to reschedule, get in touch with the event organizers, and they will do their best to accommodate you, but rescheduling is not guaranteed.

The Main Event: Pre-Flight and Execution

Before each flight attempt, you'll go through a quick pre-flight process in the Preparation Box. A DARPA representative will weigh your aircraft and payload on a certified scale and give the payload a quick look to ensure it's set up safely.

Next, a small, government-provided tracker will be attached to either your payload stack or your aircraft, with the tracker weight counting as part of the payload weight; the tracker specs will be released before the event. As it currently stands, the government-provided tracker will have two options:

1. The tracker will be similar dimensions to a 2.5-lb weight plate, collocated with the rest of the payload stack, or
2. A compact package roughly 4"x4"x2" in size (weighing 2.5 lbs.) able to be reversibly attached to your aircraft. Each team will be able to select their desired tracker form factor that best suits their design. Your aircraft plus the government tracker will be

weighed again to ensure fairness in scoring regardless of form factor selected. Your aircraft's own Remote ID will also be used for tracking when it's flying unloaded. This data helps confirm every flight is within the rules, and a display will show the pilot their tracking info and provide alerts if they stray off course. We also ask that you keep a flight log detailing the payload, flight time, and energy use for each attempt.

At the start of your official flight window, you will progress from the Preparation Box to your assigned flight lane and Competition Box, where the Lane Coordinator will ensure all your pre-flight checks are complete and give you the go ahead to prepare for flight. When it's time for your flight attempt, the run clock officially starts the second the payload lifts off the ground. Your mission is a 5-nautical-mile circuit, flown in loops. The first four miles are with the payload, and the final mile is without it (but still with the 2.5-lb tracker attached).

Your RPIC must always keep the aircraft in visual line of sight. Even with autonomous modes, a safety pilot must be ready to take manual control instantly. Your aircraft must also be self-sufficient, with no launch stands or tethers, though a manual engine start is acceptable.

Once airborne, climb to and hold 150 feet (with a +/- 50-foot margin for error). The ascent to that cruising altitude should be done quickly, within 0.5 nautical mile of the start/finish zone with the payload, and within 0.2 nautical mile without it. That altitude should be held until the pilot verbally announces to the Lane Coordinator they are beginning the descent. After 4 nautical miles, return to the landing zone to drop the payload. This must be a controlled release, with the payload or aircraft touching the ground before the plates are let go — no airdropping. (Plates being released from a landed aircraft and falling a short distance is not considered an “airdrop.”) After that, the final unloaded mile is flown before coming in for the final landing. The center of the UAS must land vertically within the designated 5-foot radius circle. The landing is considered successful only if the aircraft is ready to fly again without any repairs (beyond basic safety checks). Remember, the entire mission must be completed within 30 minutes.

If you make a mistake, you can head back to the start and try again if time allows. The Lane Coordinator will try to flag any infractions in real-time, but a post-flight data review might also uncover an issue. The Coordinator also has the authority to stop a flight at any time for safety reasons. If the stop was due to a team's error, any time lost is forfeited. If it was for an external issue, an effort will be made to credit that time back if possible. Any decision made by a coordinator can be appealed for a final ruling.

Finally, flights will only be conducted during daylight hours and in weather deemed safe by officials. That means no flights will start in the rain or if wind blows over 25 knots. If the inclement weather occurs mid-flight, the Lane Coordinator will assess the risk and make a judgment call. For momentary weather spikes, we will work on an “advantage-style” system as seen in sporting events, where the Lane Coordinator decides whether it is safe for a team to continue flying and post a score. (e.g., if you are almost done with a run and

the wind spikes above 25 knots with no safety effects, you will be allowed to continue and post your score).

Scoring, Safety, and Fair Play

Scoring comes down to a simple ratio, your Maximum Payload Weight divided by your Aircraft's Weight. The highest payload-to-weight ratio wins. In the event of a tie, the team with the fastest time will be declared the winner.

Every team needs a designated RPIC who performs a thorough pre-flight inspection with a DARPA official present before every flight. You must also have your emergency procedures planned out, an easily accessible soft or hard "kill switch" on your UAS and provide proof of FAA aircraft certification before you can fly.

If you believe another team has broken the rules, you can file an official protest within 24 hours of the alleged violation. DARPA will investigate and make a final decision.