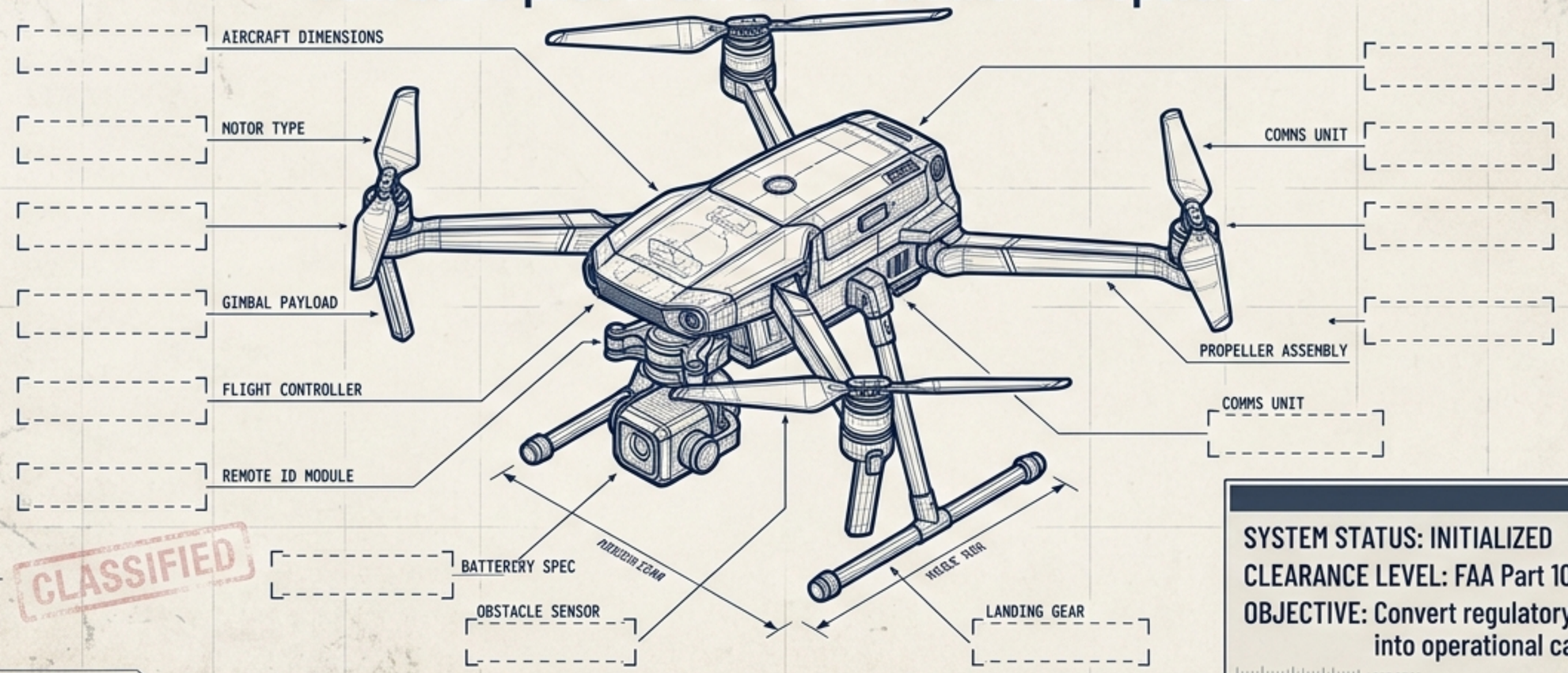
MODULE 7: ADVANCED COMPLIANCE & OPERATIONAL UNLOCKS

CLASSIFIED

Mastering Remote ID, Night Operations, OOP, and LAANC to transition from basic pilot to advanced commercial operator.



CLASSIFIED

SYSTEM STATUS: INITIALIZED
CLEARANCE LEVEL: FAA Part 107 / Part 89
OBJECTIVE: Convert regulatory restrictions into operational capabilities.

Gemini Notebook

The Capability Grid: Four Pillars of Advanced Operations

Identity (Remote ID - Part 89)



Unlock: Fleet management, urban operations, and organizational compliance.

Time (Night Operations)



Unlock: 24/7 media coverage, thermal inspections, and continuous security patrols.

Access (Operations Over People)



Unlock: Live events, construction site monitoring, and densely populated infrastructure.

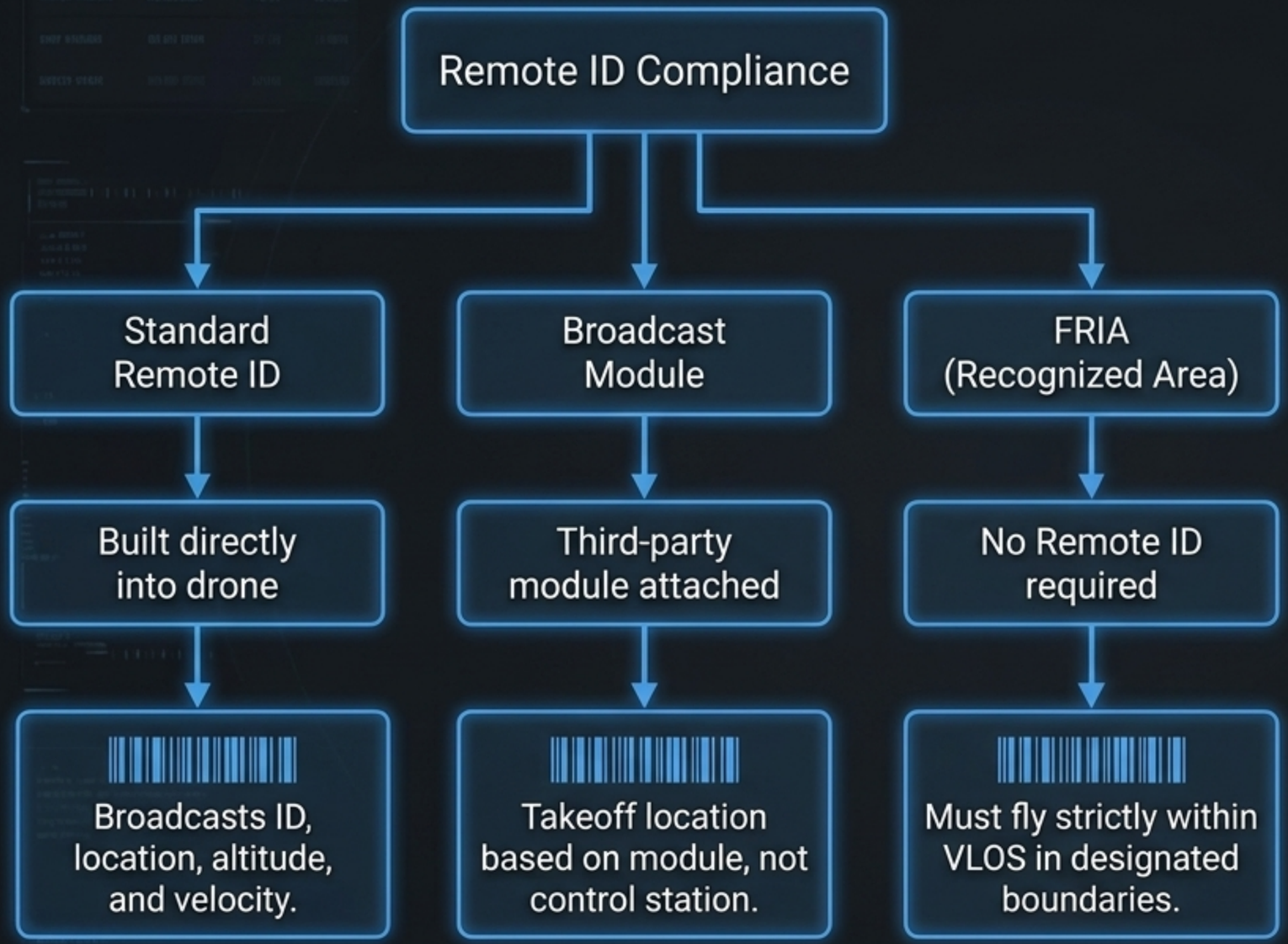
Airspace (LAANC)



Unlock: Commercial access to controlled airspace (B, C, D, E) near urban centers and airports.

Gemini Notebook

Remote ID (Part 89) Architecture



TELEMETRY ALERT:
Sub-250g Commercial Rule

A drone weighing under 250g is exempt from registration/RID only if flown recreationally.

If flown for commercial (Part 107) purposes, it MUST be registered and MUST broadcast Remote ID.

Gemini Notebook

FAA DroneZone: Fleet & Authorization Command

The Compliance Checklist

- **Registration:** $5 per aircraft (valid for 3 years).
- **Marking:** Registration number must be clearly visible on the exterior of the aircraft.
- **Inventory Logic:** Part 107 operations require each specific aircraft to have its own unique registration number (unlike recreational).

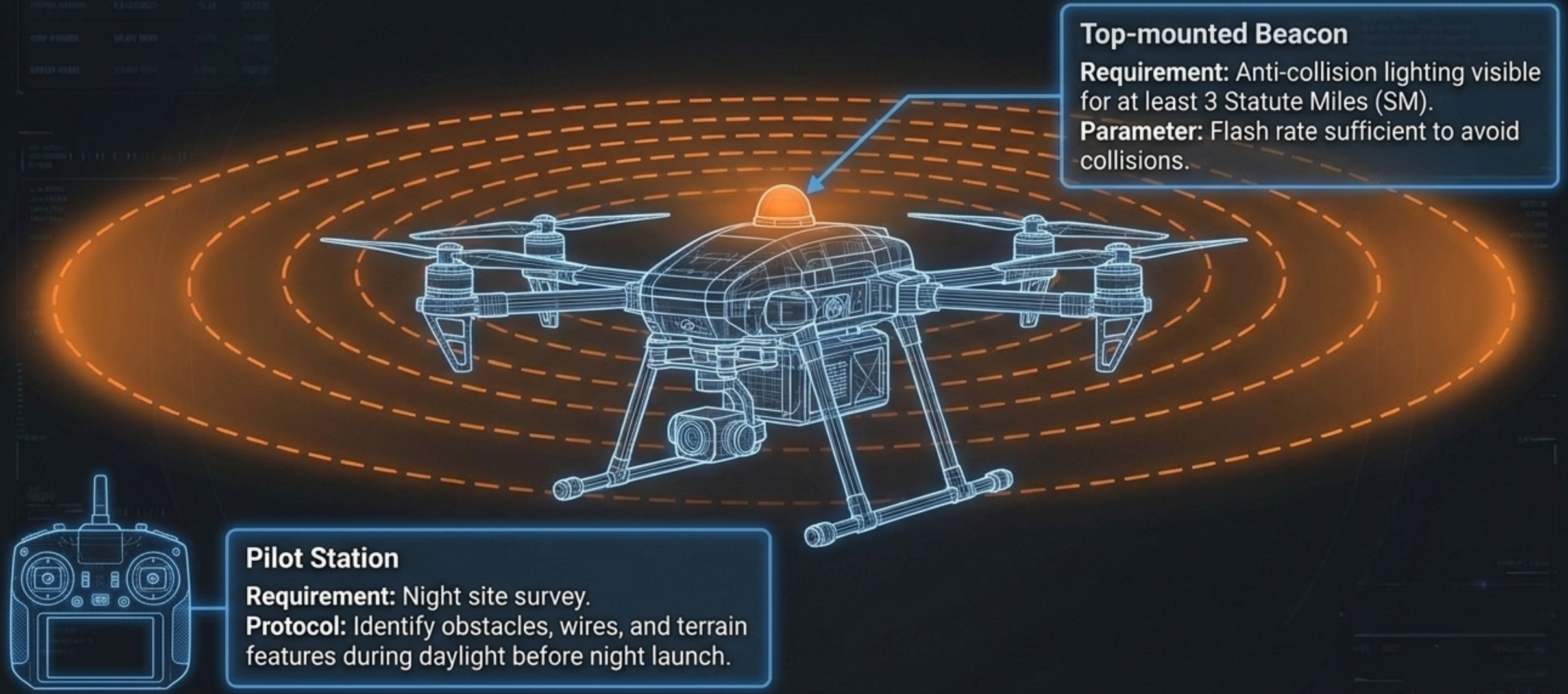
Organizational Administration



DroneZone serves as the digital headquarters for commercial operators to manage multi-drone fleets, track safety cases, and administer operational waivers.

Gemini Notebook

Owning the Dark: Night Operations Protocol



Top-mounted Beacon

Requirement: Anti-collision lighting visible for at least 3 Statute Miles (SM).
Parameter: Flash rate sufficient to avoid collisions.

Pilot Station

Requirement: Night site survey.
Protocol: Identify obstacles, wires, and terrain features during daylight before night launch.

Night operations demand spatial awareness recalibration. Anti-collision lights satisfy the FAA; the site survey protects the aircraft.

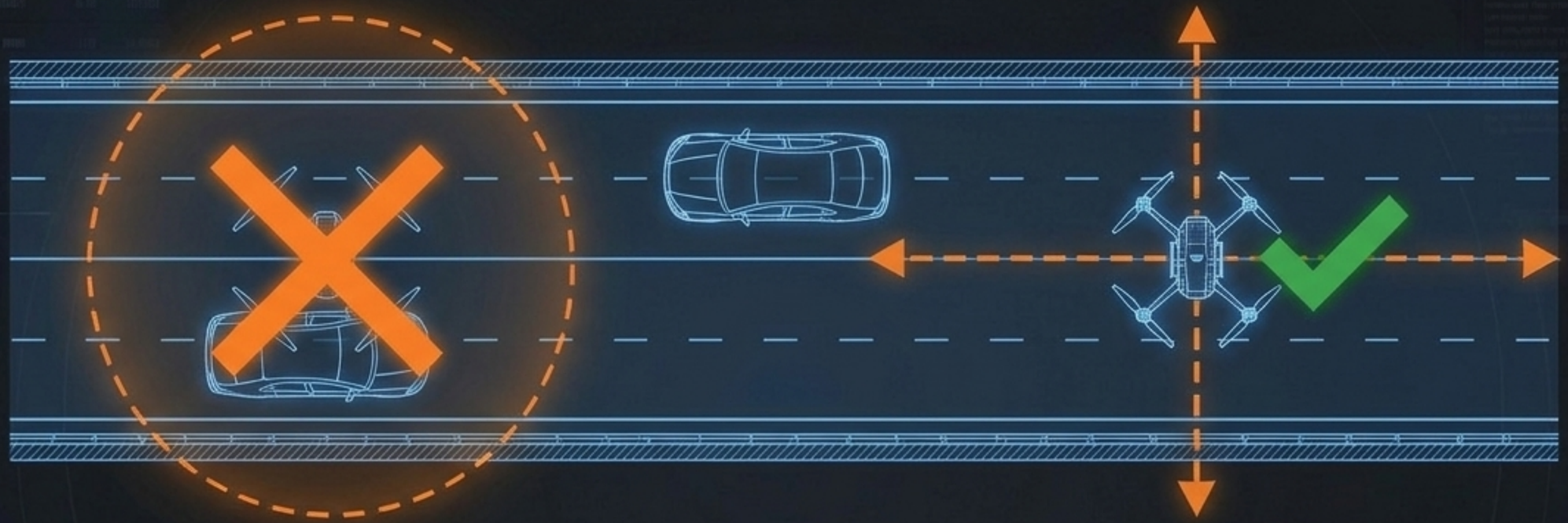
Gemini Notebook

The **Operations** Over People (OOP) Matrix

Category	Weight Limit	Kinetic / Impact Limit	Laceration Rule	Sustained Flight
Category 1 (Ultralight)	Under 0.55 lbs (250g)	N/A	No exposed rotating parts 	Permitted
Category 2 (Micro-Impact)	None specified	Max 11 ft-lbs	No exposed rotating parts	Permitted
Category 3 (Restricted)	None specified	Max 25 ft-lbs	No exposed rotating parts	Prohibited over open-air assemblies; restricted to closed-site.
Category 4 (Certified)	N/A	N/A	FAA Airworthiness Certificate Required	Based on flight manual

Gemini Notebook

The **Moving Vehicle** Protocol: Transit vs. Sustained Flight



Sustained Flight (Prohibited)

Part 107 prohibits sustained flight directly over moving vehicles containing non-participants.

Transit Protocol (Permitted)

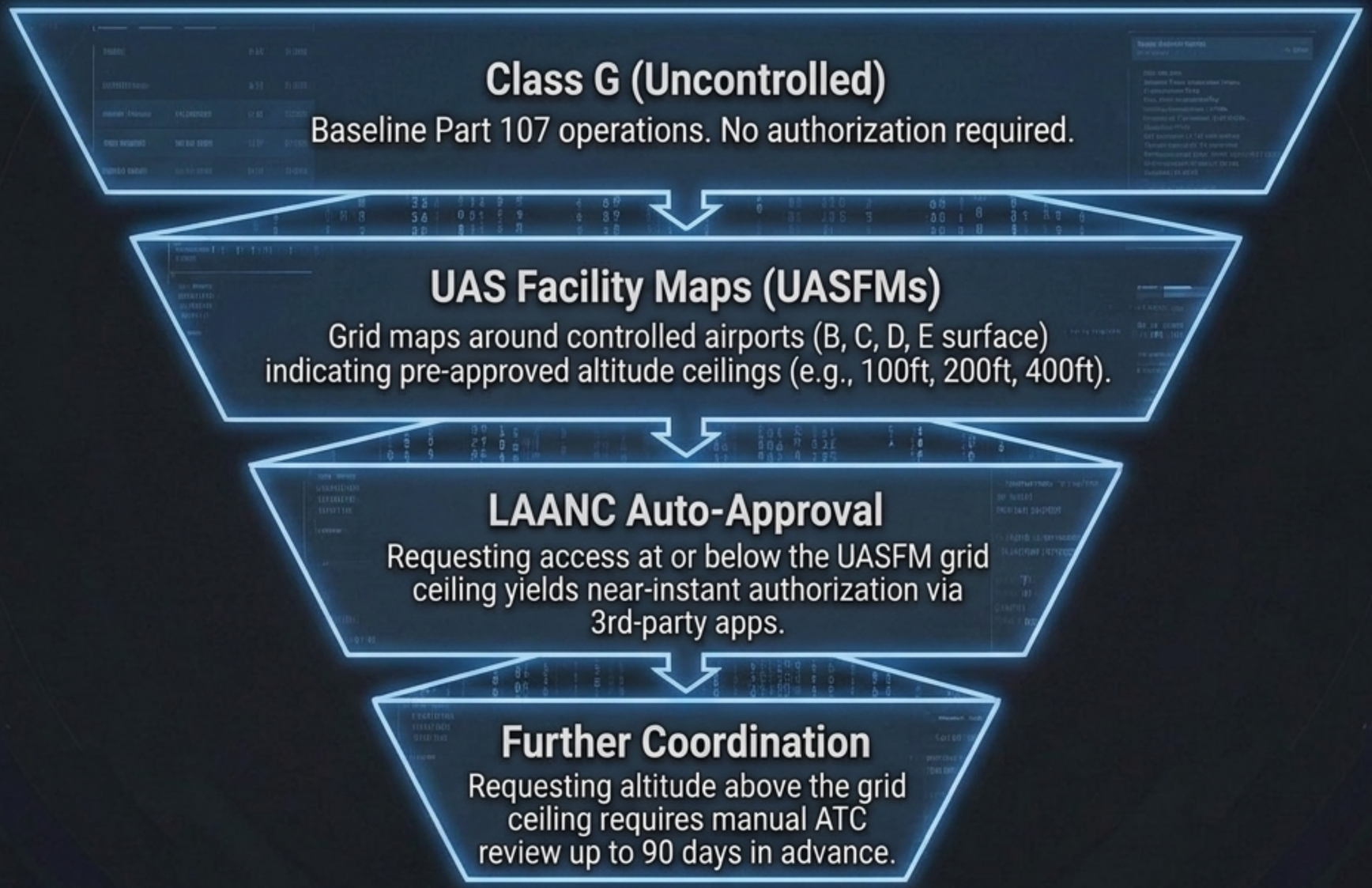
Brief, direct transit across a roadway is permitted without sustained hovering.

Closed-Site Exception

Category 1, 2, and 3 drones may operate over moving vehicles if the operation is within a restricted-access site and all occupants are on notice.

Gemini Notebook

The **LAANC Airspace Gateway**



Gemini Notebook

Beyond Standard Limits: Part 107 Waivers



The Safety Case Diagnostic

1 Identify Hazards

What new risks are introduced by breaking the standard rule? (e.g., manned aircraft collision risk).

2 Propose Mitigations

What technology or procedures will neutralize that risk? (e.g., ground-based radar, visual observers).

3 FAA Approval

The FAA grants a Certificate of Waiver detailing specific new operational parameters that must be strictly followed.

Gemini Notebook

eSports Application: Game 7 - RID & LAANC Puzzle

Mission Objective: Verify hardware compliance and secure airspace access under pressure.

Curriculum Summary Table

Game	How to Play	FAA ACS Link	Scoring
7 Remote ID & LAANC Puzzle	Verify Remote ID built-in vs broadcast module, registration $5, DroneZone inventory, simulate LAANC LAANC request for controlled airspace.	Regulations 48%	Compliance verification, LAANC
8 Night Ops & People	Night site survey anti-collision lighting, operations over people categories moving vehicles waiver determination. Authorization worksheet.	Operations 25%	Night compliance, People category

Game Loop Mechanics



Phase 1: Registration Check

Rapidly distinguish between built-in Remote ID vs. Broadcast Module capabilities for a specific fleet drone.



Phase 2: Airspace Authorization

Given a set of coordinates and a UAS Facility Map, simulate a LAANC request.



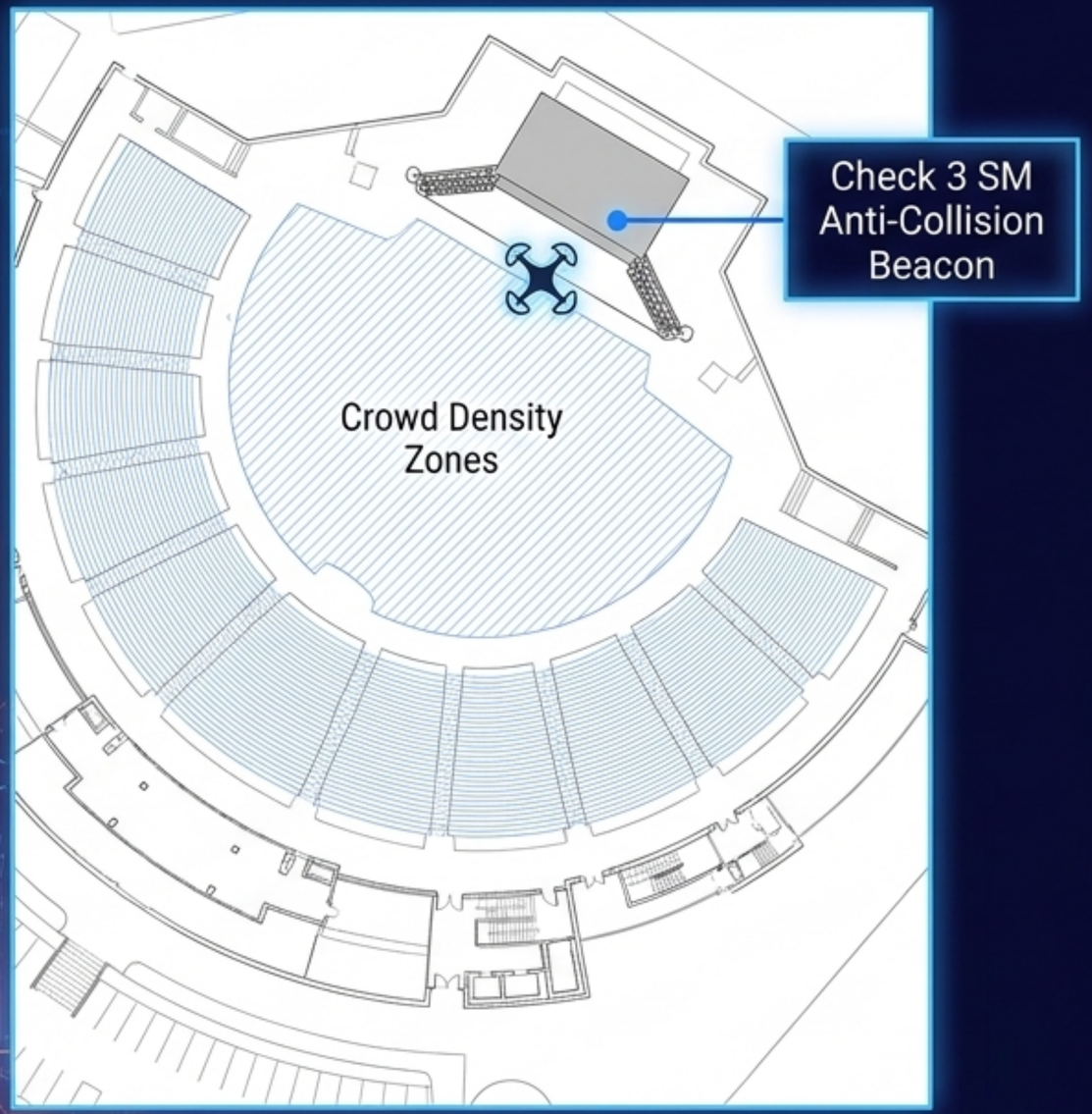
The Crucible

Formulate the authorization request correctly before the mission timer expires. Incorrect LAANC parameters result in mission failure.

Gemini Notebook

eSports Application: Game 8 – Night Ops & People

Mission Objective: Conduct a night site survey and validate an overflight waiver determination.



Curriculum Summary Table

	Game	How to Play	FAA ACS Link	Scoring
8	Night Ops & People	Night site survey anti-collision lighting, operations over people categories moving vehicles waiver determination. Authorization worksheet.	Operations 25%	Night compliance, People category

Phase 1: Night Site Survey

Identify unlit obstacles (cranes, wires) on a 3D venue map. Verify lighting equipment.

Phase 2: OOP Categorization

Evaluate the drone's weight and exposed parts against the Category 1-4 matrix to determine if flight over the crowd is legal.

The Crucible

Submit the final authorization worksheet. Any unauthorized routing over an open-air assembly results in an immediate safety penalty.

Gemini Notebook

The Mastery Standard: The 70-20-10 Scoring Logic

10% - Time

20% - Rationale

70% - Active Accuracy



Accuracy: Objective mission completion, precise data capture, and regulatory adherence.

Rationale: The "Why." Players must cite the controlling FAA rule. Guessing correctly earns zero rationale points.

Time: Speed is a bonus, awarded only after accuracy and safety are satisfied.



The Absolute Rule: Zero if Unsafe

Any decision that creates an avoidable collision hazard, ignores a required safety abort, or violates a critical limitation results in an automatic zero. Speed cannot outscore a critical safety failure.

Gemini Notebook

Capstone Synthesis: The Integrated Mission

Scenario Profile: Nighttime media overflight of a downtown construction site in Class C airspace.

Integration Checklist

☑	**Part 89 (RID):** Drone has built-in standard Remote ID broadcasting.
☑	**Night Ops:** 3 SM anti-collision lights active; daylight site survey completed.
☑	**OOP / Vehicles:** Sub-250g Category 1 drone utilized with prop guards for transit over moving site vehicles.
☑	**LAANC:** Facility map shows 100ft grid; operation planned at 80ft. LAANC auto-approval secured via app.

MISSION GO

All operational unlocks achieved without requiring a Part 107 waiver.

Gemini Notebook