STARDOM

Safe Temporal Assignment, Requirements, Deconfliction & Optimization Model

Probabilistic Scheduling for the Future of Air Mobility

The analytical engine that transforms airspace safety from tactical intervention to strategic, schedule-based assurance.

THE CHALLENGE

Advanced Air Mobility will introduce thousands of eVTOL aircraft into low-altitude urban airspace—without the tactical air traffic control that keeps conventional aviation safe. No scalable framework exists today to schedule these operations, quantify their collision risk, or establish defensible separation standards. States and municipalities preparing for AAM need an analytical foundation to regulate, certify, and monetize this emerging airspace.

THE SOLUTION

STARDOM is a probabilistic scheduling framework that replaces tactical separation with analytically defensible, time-based deconfliction. Using Monte Carlo simulation and stochastic modeling, STARDOM computes the exact temporal intervals required between any pair of aircraft at any shared intersection to achieve a specified collision-risk threshold. The result: executable daily flight schedules that are safe by design, not by intervention.

WHY IT MATTERS

STARDOM enables a **new regulatory and economic model for AAM airspace**. Just as states developed infrastructure to test, regulate, and commercialize autonomous vehicles on public roads, STARDOM provides the safety-analytical backbone for states and regional authorities to do the same in urban airspace. By quantifying collision risk as a function of scheduling policy, STARDOM gives regulators defensible tools to certify corridor operations, set performance-based entry requirements for operators, establish throughput-based fee structures for shared airspace, and attract AAM investment by demonstrating safety assurance infrastructure.

CAPABILITIES

Temporal Deconfliction

Schedules precise time-based intervals at shared airspace intersections without tactical ATC

Probabilistic Risk Quantification

Monte Carlo simulation produces collision-risk estimates calibrated to aviation Target Levels of Safety

Heterogeneous Fleet Scheduling

Pair-specific minimum intervals for mixed vehicle types—no one-size-fits-all separation rules

Geographic Transferability

Venue-independent framework validated across distinct metro environments and wind regimes

Regulatory-Ready Outputs

Transparent, repeatable safety metrics and executable schedules for policy evaluation
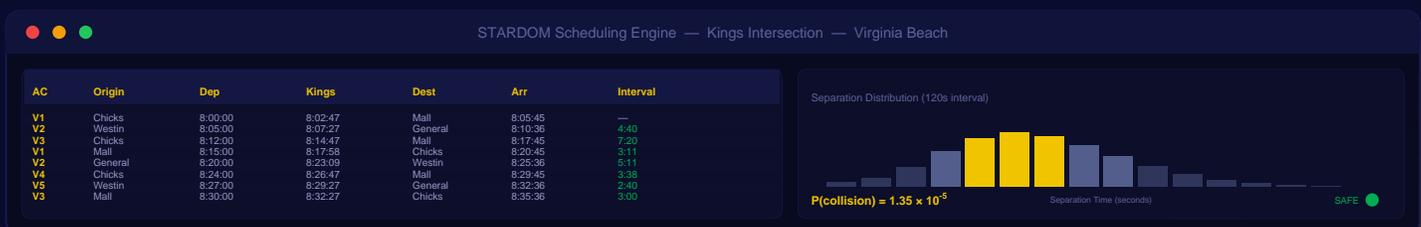
10^{-7}	15	6
Collision-Risk Threshold	Vehicle Pairings Analyzed	Simulated Aircraft Types

STARDOM Scheduling Engine — Kings Intersection — Virginia Beach

AC	Origin	Dep	Kings	Dest	Arr	Interval
V1	Chicks	8:00:00	8:02:47	Mall	8:05:45	—
V2	Westin	8:05:00	8:07:27	General	8:10:36	4:40
V3	Chicks	8:12:00	8:14:47	Mall	8:17:45	7:20
V1	Mall	8:15:00	8:17:58	Chicks	8:20:45	3:11
V2	General	8:20:00	8:23:09	Westin	8:25:36	5:11
V4	Chicks	8:24:00	8:26:47	Mall	8:29:45	3:38
V5	Westin	8:27:00	8:29:27	General	8:32:36	2:40
V3	Mall	8:30:00	8:32:27	Chicks	8:35:36	3:00

Separation Distribution (120s interval)

$P(\text{collision}) = 1.35 \times 10^{-5}$ Separation Time (seconds)   SAFE ●

Enabling States to Lead the AAM Economy

States that invest in AAM safety infrastructure today will define the regulatory and commercial framework for this industry—just as early autonomous vehicle test corridors shaped ground transportation policy. STARDOM provides the analytical foundation for state aviation authorities to establish certified AAM corridors, set evidence-based performance requirements for operators, and create sustainable revenue models for shared airspace access. Concept Solutions is actively partnering with forward-thinking state and regional authorities to stand up this capability.