



# Hawai'i Aerospace Port Assessment

*Feasibility Study & Options Overview*

*Exploring opportunities with respect for land and people*



# Purpose & Scope

- Evaluate the feasibility of establishing an aerospace port in Hawai'i, leveraging the state's unique geography, infrastructure and economic context.
- Present the current landscape of options across testing, horizontal operations, vertical concepts and hybrid approaches.
- Summarize anticipated approvals, costs, risks, community considerations and timelines for each option.
- Provide an informational, non-prescriptive guide; all decisions rest with the State of Hawai'i and Hawai'i Technology Development Corporation (HTDC).

# Definition: What is an Aerospace Port?

A coordinated set of facilities and services enabling aerospace and innovative aviation activities under FAA oversight.



## Horizontal

Air-launch missions, spaceplanes, Advanced Air Mobility (AAM), Urban Air Mobility (UAM) & Unmanned Aerial Vehicle (UAV) demand & drone testing at existing airports.



## Vertical

Dedicated off-airport pad for orbital or suborbital rockets.



## Phased Model

Shared Telemetry, mission control, safety systems, clean rooms & training.

**Note:** Vertical launches require full environmental and cultural reviews. No vertical launches occur at airports.



# Options + Phased Strategy

## Horizontal

Runway-based operations at existing airports (Hilo, Pacific Missile Range Facility (PMRF), Lana'i).

## Vertical

Dedicated off-airport pad at Kea'au, PMRF or Lana'i.

## Hybrid/Distributed

Combination of horizontal & vertical sites; multi-island network; phased entry based on demand.

## No Build

Status quo (maintain current operations, no spaceport).

## Phase 1: Now–2027

Horizontal & AAM/UAV pilot at existing airports



## Phase 2: ~2028–2030

Introduce vertical site pending approvals & community support

# Launch Options

## *Assessment of potential aerospace port development scenarios*

**Option 1:** Horizontal-Only Launch at Hilo International Airport (Hawai'i Island)

**Option 2:** Vertical-Only Launch on Private Land Near Hilo (Kea'au, Hawai'i Island)

**Option 3:** Phased Hybrid Development – start with Hilo horizontal, then add a vertical site (Hawai'i Island or elsewhere)

**Option 4:** Horizontal-Only Launch at PMRF (Kaua'i)

**Option 5:** Vertical-Only Launch at PMRF (Kaua'i)

**Option 6:** Hybrid Launch Complex at PMRF (Kaua'i) – both horizontal and vertical at the same base

**Option 7:** Horizontal-Only Launch on Lāna'i (at Lāna'i Airport)

**Option 8:** Vertical-Only Launch on Lāna'i (coastal private land)

**Option 9:** Hybrid Launch Complex on Lāna'i (both horizontal & vertical)

**Option 10:** “No Build” – i.e. maintain the status quo, with no new Aerospace Port

**Option X:** Distributed Launch Network—a multi-island approach of any combination above.





# Market Drivers & Investment

- The advanced Air Mobility Market (AAM) is ***projected to soar from \$11.5B (2024) to \$73.5B by 2034***, signalling huge potential demand.
- Venture capitalists invested approximately ***\$8.6B across 595 deals in 2024, a 75% year-over-year increase***.
- Launch costs have plummeted: the Space Shuttle cost ~\$54,500/kg whereas reusable Falcon 9 missions cost roughly \$2,720/kg.
- These converging trends create a window for Hawai'i to capture investment, technology, and talent by moving quickly.

# Project Goals & Framework



## Safety

Meet or exceed FAA (Part 420/450) requirements; maintain clear safety zones; aim for incident-free operations through rigorous audits and emergency drills.



## Operational Efficiency

Maximize use of existing assets; ensure quick turnaround between launches; achieve high pad utilisation via streamlined procedures and joint-use facilities.



## Sustainability

Ensure long-term financial viability; minimise environmental impacts; phase investments; implement mitigation plans covering noise, debris recovery and wildlife monitoring.



## Community Alignment

Earn and sustain local support through advisory boards, hiring commitments, “talk story” sessions, cultural sensitivity training and visible benefit sharing.



# Market & Geographic Context

- **Launch Pace:** Around 254 orbital launches occurred globally in 2024; US providers completed roughly 154 launches (~61% share).
- **Satellite numbers:** Approximately 2,730 CubeSats had been launched by early 2025 with ~1,900 more nanosats forecast to deploy by 2029.
- **Aircraft and Drone Innovation:** The Advanced Air Mobility (AAM), Urban Air Mobility (UAM) & Unmanned Aerial Vehicle (UAV) market is projected to grow from \$11.5B in 2024 to \$73.5B by 2034 (20.6% CAGR). Example: Air Taxis; optionally piloted helicopters, i.e., for fire fighting.
- **Geographic Position:** Hawai'i's lower latitude reduces the required orbital velocity and its open ocean corridors favour both equatorial and polar launches.
- **Repurposing:** Existing assets like Hilo's runway & harbour and PMRF's instrumented ranges provide a strong foundation.



# Past Evaluated Sites & Lessons

## Hilo International Airport (ITO)

Early 2000s concept near the airport; strong logistics but community concerns about noise; remains viable for horizontal launches and as a support hub. (At safety perimeter, less noise than a USAF F-22 fighter.)

## Kea'au (W.H. Shipman Estate)

2019 proposal for a small-rocket facility; good over-ocean trajectory and moderate isolation; halted due to volcanic risk and lack of effective community outreach; highlights need to address hazards and benefits transparently. (Model after Maui Cultural Protective Zone, i.e. Wialea coast)

## Cape Kumukahi (Kapoho)

Equatorial launch site considered in the 1990s; high lava risk and potential radar interference with astronomy ended the effort.

## Palima Point (Ka'ū Coast)

Late-1980s plan for a Delta II-class facility; robust environmental impact statement but community fears over fuel transport and hazard risks scuttled the project; emphasised transparency and emergency planning.

## Ka Lae (South Point)

Remote cape ideal for polar and retrograde orbits; culturally sacred land with no infrastructure; ***opposition illustrates that technical perfection is meaningless without social license.*** (Priority #1)



# Goals & Data Sources

Goal	Metrics	Key Actions
<b>Safety</b>	FAA compliance (Parts 420/450), zero incidents, emergency response times	Define hazard zones & exclusion areas; conduct drills & audits; coordinate with responders
<b>Operational Efficiency</b>	Launch cadence & turnaround; facility utilisation; scheduling efficiency	Optimise scheduling; leverage existing assets; streamline procedures
<b>Sustainability</b>	Revenue/cost ratio, capital recovery, environmental compliance	Phase investments; implement mitigation plans; monitor environmental indicators
<b>Community Alignment</b>	Local hire & engagement metrics; sentiment index; outreach events	Establish advisory board; host outreach sessions; offer internships & training



- Comprehensive literature & data reviews drawing on FAA forecasts, BryceTech, Space Foundation and NASA studies
- Site assessments synthesising past environment analyses (e.g. 1990s Palima Environment Impact Study (EIS) with new Geographic Information Systems (GIS) modelling of launch trajectories & hazard zones
- Stakeholder outreach with HTDC, Hawai'i Space Flight Laboratory (HSFL), Pacific International Space Center for Exploration Systems (PISCE, commercial firms and community representatives to gauge needs and concerns
- Order-of-magnitude cost estimates derived from analog spaceports and refined using RIMS II multipliers for Hawai'i's economy

# Market Demand by Sector



## Defense & Government

- Global government space spend: ~\$132B (2024); U.S. share ~\$77B
- Responsive launch needs drive demand; Hawai'i offers equatorial corridors & uncrowded range
- Strategic fit for DoD responsive space ops



## Science & Education

- 2,730 CubeSats launched by Apr 2025; ~1,900 more by 2029
- NASA invests ~\$143M for STEM payloads & educational missions
- Moderate–high demand; local launches enable STEM integration & workforce growth



## AAM & UAV

- ~858K commercial drones projected by 2026; AAM market grows from \$11.5B (2024) to \$73.5B (2034)
- FAA rules pave the way for eVTOL services by ~2026
- Hawai'i's island geographies provide ideal test ranges & early revenue opportunities



## NewSpace Commercial

- Global space economy: ~\$613B (2024); small launch market ~\$3.5B
- ~13K small satellites expected by 2030; 70–90 direct jobs per launch site
- Hawai'i's equatorial & polar corridors attract small-launch firms seeking flexibility



# Economic & Job Impact

- Every \$1M invested in construction supports roughly 6.5 local jobs, illustrating how even modest spending can stimulate employment.\*
- Beyond direct jobs, a thriving aerospace port catalyses demand for IT, cybersecurity, advanced manufacturing, automation and renewable energy sectors.
- These spillover industries diversify Hawai'i's economy and build long-term resilience beyond tourism and agriculture.

*\*Source: Estimate based on the application of U.S. Bureau of Economic Analysis (BEA) RIMS II economic multipliers specifically for the State of Hawai'i*

Category	Range	Description
Horizontal Upgrades	\$3–5M	Runway, comms & hangar enhancements at existing airports
Vertical Pad	\$15–25M	Dedicated off-airport launch pad and control suite
Combined Programme	\$18–30M	Sequenced horizontal & vertical build over 2–5 years



# Job Creation & Payroll

- During construction (~2026–2028), the port will employ 50–75 on-site workers plus 60–90 indirect jobs, yielding ~\$10M in total payroll over two years.\*
- Operationally, by ~2030 the facility is expected to support 70–80 on-site jobs and a further 75–100 jobs in the broader economy.\*
- Assuming average wages of ~\$80K per direct job, this translates to ~\$4.8M in direct payroll and \$9–10M including multipliers.\*
- Employment could climb further if launch cadence and tenant mix expand beyond initial expectations.\*

*\*Sources:*

- *Tauri Group. 2023. "Economic Impact of Small Launch Ranges." Alexandria, VA: Tauri Group.*
- *Deloitte. 2024. Cost-Benefit Framework for Spaceport Investments. New York, NY: Deloitte.*

# Funding Models & Revenue Sources

Model	Description	Pros & Cons
<b>Public</b>	State builds, owns & controls core infrastructure; tenants lease pads & pay per launch (e.g. Kodiak, Wallops)	Full public control & alignment with local values; state bears capital & operating risk
<b>Private Concession</b>	Private entity builds & operates the port under a long-term concession; state provides land & regulation (e.g. partial concession at Spaceport America)	Shifts financial risk to private sector; requires anchor tenant; less state control
<b>Hybrid</b>	Mix of state funds, federal grants (e.g. FAA STIM), and private investment via leases or revenue bonds (e.g. Space Florida model, Blue Origin)	Shares cost & risk; leverages grants; complex coordination & early commitments required

Source	Description & Estimates
<b>Launch Fees</b>	Range fees (~\$100–300K per small orbital launch); 10 launches yield ~\$2M/year
<b>Fuel &amp; Services</b>	Charges for propellants, ground handling & technical services; adds 10–20% on top of base fees
<b>Facility Leases</b>	Rent for hangars, integration bays & offices (~\$200–500K per tenant per year; multiple tenants yield millions)
<b>UAV/AAM Test Range</b>	Hourly/daily fees for drone & eVTOL testing (\$1K–5K/day); early revenue stream in Phase 1
<b>Tourism &amp; Education</b>	Revenues from visitor centre, launch viewing & educational programmes (~\$5K per event)



# Facility & Infrastructure Requirements

- Horizontal & AAM/UAV ops: leverage FAA-certified runways at Hilo & PMRF; upgrades limited to communications, runway reinforcement and hangar space (~\$3–5M). No vertical launches at airports per HDOT guidance.
- Vertical ops: dedicated off-airport pad with launch control suite, flame trenches, water deluge & exclusion zones; site choice (Kea'au, PMRF, Lana'i) depends on trajectory, community and DoD coordination.
- AAM/UAM/UAV: vertiports with clear zones, charging/hydrogen infrastructure, weather-protected bays; integrated with existing aprons; capacity for 5–10 daily operations initially.
- Ground control & connectivity: low-latency telemetry, fibre optic & RF links; agreements with FAA for airspace; solar microgrids for resilience.



# Risks & Mitigation

**Safety:** Establish ground hazard areas & downrange exclusion zones; use automated flight termination systems; coordinate with FAA & emergency responders; conduct drills and public notifications.

**Environmental:** Prepare HEPA/NEPA mitigation plans; avoid critical breeding seasons; employ shielded lighting and noise suppression; plan hardware jettison away from coral & fisheries; implement containment & monitoring.

**Cultural:** Conduct cultural impact assessments and outreach; involve lineal descendants and practitioners; provide cultural monitors with pause authority; establish buffers for cultural sites; integrate cultural protocols and advisory boards.

**Community & Operational:** Perform traffic analyses; avoid residential overflights; adhere to dark-sky practices; offer local hiring and education; maintain transparent communications; consider liability frameworks & insurance.



# Decision Considerations & Next Steps

- **Opportunity & Potential:** Hawai'i possesses the right geography, infrastructure and talent to build a vibrant aerospace hub. Success would diversify the economy with high-paying jobs and generate tens of millions in economic activity.
- **Community Dialogue & Participation:** Host briefings/listening sessions; form advisory mechanisms; refine options with community input.
- **Independent Review & Pathfinding:** Commission technical/economic analyses; scope HEPA/NEPA pathways; anticipate EIS as needed; pre-application consultations with FAA.
- **Outreach & Trust Building:** Maintain a public website; provide accessible summaries of safety, cultural and environmental practices; demonstrate how feedback shapes decisions.
- **Safety, Cultural Stewardship & Workforce:** Develop comprehensive plans; coordinate with responders; gauge market interest; collaborate with universities on training.

***Success hinges on speed, trust and execution — act swiftly to seize the moment, partner respectfully with Hawai'i's communities and cultural stewards, and deliver on promises. Refine this assessment as a living document, updating it continually with new data and dialogue to chart an inclusive, sustainable path.***

# Hawai'i Aerospace Port Assessment

*Feasibility Study and Options Overview*

---