Mounting a comeback

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The drive towards increased efficiency in maritime transport has renewed interest in alternative modes of coastal mobility. Among them, a wing-in-ground (WIG) craft exploits aerodynamic advantages when flying near the water's surface and offers the potential for significantly reduced energy consumption and higher speeds compared to traditional ferries or surface vessels.

Historically, however, WIG crafts (known under many names: ground/surface-effect vehicle/craft/machine, wingship, flarecraft, ekranoplan, or screenglider) have faced commercial stagnation. Several established companies have nevertheless persisted in developing the technology. Aron Flying Ship in South Korea since 2008 and AirX (previously Wigetworks) in Singapore since 2004 continue to advance Lippisch-based[1] designs for operational readiness. More recently, a new generation of developers has emerged, among them REGENT Craft in the US, actively developing all-electric WIGs intended for zero-emission coastal transport since 2020.

Tech curiosities

Experiments dating back to the early-to-mid-20th century[1,2,3] showed that flying just a few metres above the water dramatically increases lift and reduces drag, improving efficiency and payload capability. Soviet-era[4] ekranoplans proved that large WIG vehicles could indeed reach high speeds, but their practical use remained limited. Most designs struggled with wave tolerance, harbour manoeuvrability & stability issues, demanded specialised piloting skills due to the unique handling characteristics of ground-effect flight, and required long take-off runs.

As such, WIG crafts remained technological curiosities rather than practical transport solutions. But their ability to operate without runways and follow direct over-water routes continued to attract interest in their potential advantages. The renewed wave of development observed today builds on lessons from these early attempts, combining improved control systems, lighter materials, and clearer operational strategies to address shortcomings that historically prevented widespread adoption.

Four steps to a successful liftoff

An analysis covering the companies above shows that advancement is shaped by several interconnected factors: technological & certification readiness, organisational capability, market alignment, and safety & operational compliance.

To move beyond experimental status, a WIG craft must demonstrate stable performance in varying sea states, predictable low-speed manoeuvrability, and the ability to satisfy emerging regulatory expectations. Earlier concepts frequently failed in one or more of these areas, highlighting the importance of mature testing programmes and a clear path towards classification.

Developing WIG crafts requires sustained engineering effort, interdisciplinary expertise, and structured design & testing processes. Companies that can secure stable funding, maintain experienced teams, and coordinate development activities effectively are more likely to achieve consistent progress.

Commercial success depends on whether a WIG craft can offer operators a clear value proposition, including high speed, energy efficiency, emission reductions, and route suitability. Integration with existing port infrastructure and early engagement with coastal communities influence acceptance and determine whether operators view WIGs as practical additions to their networks.

Any commercially viable WIG craft must satisfy modern safety expectations. This involves control systems, stability augmentation, and predictable handling characteristics that enable safe operations within maritime environments. Without robust safety foundations, broader deployment remains unlikely.

Comparison of developers

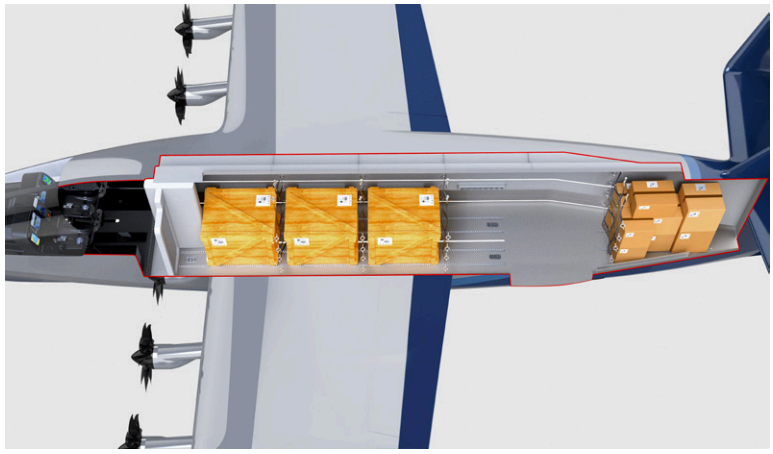
Applying these success factors to the three active WIG developers reveals significant differences in their maturity and strategic positioning. The comparative evaluation ranked REGENT Craft highest with a score of 77, followed by Aron Flying Ship with 52, and AirX with 42.

Aron Flying Ship and AirX benefit from long development histories and accumulated operational experience with Lippisch-derived configurations. Their strengths are in refinement, repeated prototype testing, and a solid understanding of stability & control behaviour in ground effect. However, both operate with comparatively modest financial and organisational resources, which limits their ability to scale production or accelerate certification efforts.

REGENT Craft has achieved a higher overall result due to strong investor engagement, a broad portfolio of commercial partners, and a development model that integrates aerodynamic innovation with electric propulsion, digital control systems, and hydrofoil-assisted operation.

All three companies aim to address the same operational and regulatory challenges. Their varying levels of resource capability, investment, and technological innovation

[1] *Alexander Lippisch developed ground-effect configurations in the 1960s, most famously the X-113 and X-114 prototypes.*
[2] *Alexander Espenlaub (Germany, 1920s-30s) conducted low-altitude glider experiments that demonstrated early manifestations of the ground-effect phenomenon*
[3] *Claude Dornier (Germany, 1920s-30s) led flying-boat development, whose near-surface take-off and landing trials provided early empirical observations of ground-effect lift.*
[4] *Toivo Juhani Kaario (Finland, 1930s) considered the first to experiment with motor-powered ground-effect craft.*
[5] *Rostislav Alexeyev (Soviet Union, 1960s-80s) developed KM* Caspian Sea Monster, *Orlyonok series, Lun-class.*



Photos: REGENT Craft

explain why their progress diverges. REGENT Craft was chosen for a closer look, as its strategy aligns most strongly with the success factors outlined above and demonstrates how a new generation of developers is redefining the WIG concept.

Resources + testing + commitment

REGENT Craft aims to develop a fully electric, zero-emission WIG craft intended to combine maritime accessibility with aircraft-like speed and comfort. Interviews confirmed that the development strategy centres on integrating advanced propulsion technologies, digital control systems, and, potentially, future AI-supported functions to enhance operational predictability & safety.

The company's product development focuses on two models: *Viceroy*, a 12-seat craft prototype that saw its first sea trials in 2025, and *Monarch*, a 50-100-seat variant aimed for commercial operation by 2028. The former is expected to reach speeds of up to 291 km/h with a range of 290 kilometres, operating solely on battery power recharged at ports. The latter is projected to achieve a 650-km range with a significantly higher payload capacity.

Over the past five years, REGENT Craft has secured several billion US dollars in pre-orders through pre-sale agreements and strategic collaborations, supported by a wide investor base comprising airlines (23.5%), ferry and shipping operators (17.8%), logistics companies (3.9%), strategic corporate (5.0%) & individual investors (10%), and venture capital firms (40%). The company maintains the largest portfolio of technical development collaborations, community engagement initiatives, and commercial distribution agreements among the evaluated WIG developers. These include partnerships with Hawaiian Airlines, Japan Airlines, and Surf Air Mobility; Brittany Ferries and UME Shipping; and strategic industrial partners such as TotalEnergies, Lockheed Martin Ventures, and Yamato Holdings. Regulatory readiness is supported through cooperation with Lloyd's Register and test approvals from the U.S. Coast Guard. REGENT Craft has announced a $322 million investment plan for a dedicated manufacturing facility in Rhode Island, with $100m raised to date.

In the comparative evaluation, REGENT achieved the highest environmental score owing to its fully electric propulsion strategy and integration of sustainability objectives across technical, operational, and commercial planning. Although its models are still in prototype and design stages, the company's ability to mobilise resources, accelerate testing, and secure high-value commitments from operators gives it a strategic advantage over more established competitors.

Commercial reality push

After almost a century of episodic progress, WIG crafts are re-entering the innovation cycle with new momentum. Modern engineering tools, digital control systems, and the shift towards electrified maritime mobility are turning their challenges into advantages. They might even compete with both ferries and regional aircraft.

The approaches taken by WIG craft developers show the field is no longer defined by technical curiosity but by a clear push towards commercial reality. WIG crafts may soon deliver a new class of fast, efficient, and climate-aligned coastal transportation. ■