

Case Study:

→ **Koerschulte  
+  
Werkverein**  
Drone Logistics  
Service



**FOUNDERS:** **Norman Koerschulte**, Managing Director Karl Koerschulte GmbH; **Lukas Ostermann**, Head of Research & Development

**LOCATION:** Lüdenscheid, Nordrhein-Westfalen, Germany

**TEAM SIZE:** 7

**SET-UP:** Suburban

**SYSTEM READINESS LEVEL (SRL):** 8

**FOUNDING YEAR:** 2019

[koerschulte.de](https://koerschulte.de)

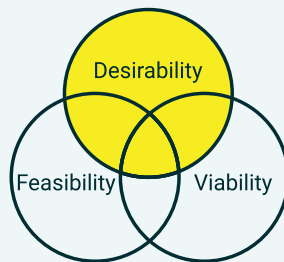
## At a Glance

Karl Koerschulte GmbH is a fourth-generation family business headquartered in Lüdenscheid, specializing as a wholesaler of products related to occupational safety, operating equipment, electrical tools, quality tools, and welding technology. In response to traffic congestion caused by the A45 bridge demolition, the company introduced dronebased last-mile delivery in partnership with Third Element Aviation, a drone manufacturer and HHLA Sky-software development subsidiary of Hamburger Hafen Logistik AG. The first successful test flight took place at the end of 2020, during which a drone flew one kilometer and automatically landed at Hotset, a leading control panel manufacturer, delivering a package of spare parts without incident. Karl Koerschulte GmbH is also actively involved in regional EU drone projects such as BLU-Space and SIDDA and AI4DRONE.



### Use Case: Spare Parts Logistics

When an order is received by Karl Koerschulte GmbH, the drone is loaded and sent on a predetermined route at speeds of up to 60 km/h. It delivers goods to secure, fenced landing areas—called ‘nests’—located in the customer’s building. Sensors optimize the approach for safe loading and unloading. A signal is sent to the customer’s shop before landing, allowing them to access the nest. Data security is ensured through blockchain encryption.



### Regulatory: SAIL III

In 2021, they partnered with Third Element Aviation and HHLA Sky to secure route permissions, achieving SAIL III approval in 2023, becoming the first German operator to achieve this milestone. Koerschulte adds five additional flight routes in Lüdenscheid, enabling highly automated drones to deliver up to 80 parcels per day to local customers, with ambitions to expand these routes across Germany and Europe.



“The fully automated logistics process from collection to delivery, makes all subsequent operations more efficient for our customers. The civilian applications for drones are almost unlimited, ranging from B2B logistics to emergency logistics and beyond.”

**Norman Koerschulte,**  
Managing Director Karl Koerschulte GmbH

## Technology

### Integrated Control Center (ICC):

- The HHLA Sky Integrated Control Center (ICC) is essential for scaling the delivery service and ensuring operational efficiency. It enables BVLOS automated operations, allowing a single pilot to manage up to 12 drones, with the ICC capable of controlling over 100 drones at once.

### The Nest-take-off and landing platform

- A secure, fenced landing which is serving as a charging station for the drones, using renewable energy.

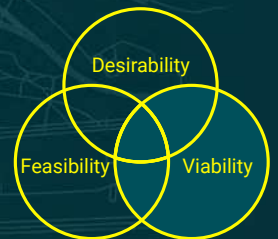
### Drones: (VTOL)

- The cargo drone “The Auriol” by Third Element Aviation has a load capacity of up to 10 kilograms, a maximum flight time of 50 minutes, a top speed of 90 kilometers per hour, and is also equipped with a safety parachute.
- The team, with Third Element Aviation, developed a flexible system to optimize range and weight, allowing the drone’s battery and payload to be adjusted for different delivery scenarios.



## Business Model

The scalability of the business model in this use case is driven by increasing the number of drones in operation. With fixed pilot costs and a limit on the number of drones each pilot can manage, expanding the customer base is essential.



### Pay-per-Delivery

Charges are applied per delivery, similar to standard delivery methods.

### Premium Delivery

A premium service is designed for time-sensitive deliveries, particularly in cases where delays could result in significant operational costs.

### Drone-as-a-Service

The service provides operational support for various drone related projects, including route planning, flight operations, and coordination with drone operators to ensure seamless execution.

## Impact

A premium service designed for time-sensitive deliveries, particularly in cases where delays could result in significant operational costs. Drone delivery provides a fast, eco-friendly solution to logistical challenges, reducing delivery times, costs, and downtime. Powered by renewable energy, it supports sustainability and minimizes wildlife disruption through carefully planned routes. The technology also creates new job opportunities, with plans to train in-house drone pilots for future operations.

“When implementing drone delivery, it’s important to recognize that it’s a new and evolving field, requiring frequent reassessment and process redesign. Many aspects, particularly regulations, are often more complex than initially expected. It’s crucial to allocate more time than anticipated to navigate these challenges.”

**Lukas Ostermann**, Head of Research & Development

## Conclusion

This real-life use case highlights the importance of industry-specific applications for proving the viability of drone delivery. The automated delivery marks a key milestone, showcasing the potential of regular drone flights to improve logistics operations and boost efficiency across various industries.