Case Study:

→ # URBAN RAY

Leveraging Ground Stations to Pave the Way for Urban Logistics

FOUNDERS: Fabian Binz COO, **Henry Schmidt** CTO, **Cem Uyanik** CEO

LOCATION: Cologne, Germany

TEAM SIZE: 15+

SET-UP: Urban

SYSTEM READINESS LEVEL (SRL): 6

FOUNDING YEAR: 2022

urban-ray.com

At a Glance

Founded in 2022 as a spin-off from RWTH Aachen, Urban Ray is transforming urban logistics with its fully autonomous aerial delivery solution. By connecting pick-up lockers with flying couriers, Urban Ray enables on-demand delivery, reducing transportation costs and the number of cars on the streets while significantly increasing delivery capabilities.

The team of 20 drone experts is currently applying the technology in testbeds in Cologne. They aim to launch their first urban delivery use case in 2026, focusing on medical deliveries with Klinikum Darmstadt and partner labs. Currently, they are co-designing the customer delivery flow, onboarding the users, and conducting testing flights.

Use Case: Medical

Urban Ray's medical delivery process begins at a hospital, where a blood sample is prepared. The sample is then handed over to a ground station where it is automatically loaded into the drone. Upon reaching the laboratory at another ground station, the sample is unloaded, the battery is replaced (both fully automatically), and the aircraft is ready for the next delivery in under a minute. In the future, Urban Ray plans to integrate the entire logistics network, including labs, hospitals, and pharmacies to create a cohesive, efficient service ecosystem.
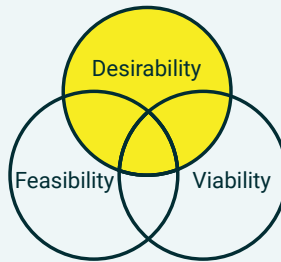
Regulatory: SAIL II

In July 2024, Urban Ray secured SAIL II operational approval from the German Federal Aviation Office (Luftfahrt-Bundesamt, LBA) to conduct Beyond Visual Line of Sight (BVLOS) flights with its full-scale drones on three designated routes near Cologne, North Rhine-Westphalia (NRW).

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Technology

Drones (VTOL)

Urban Ray's aircraft are optimized for the transport of medical supplies, spare parts, and customer goods.

- Regulation-compliant flight termination system
- 40 minutes of flight time
- Maximum range of 30km
- Cruise speed of 72km/h
- Maximum payload weight of 6kg
- Maximum volume: 18 liters
- The battery is swapped after each delivery in less than 60 seconds
- From order to pick-up in less than 10 minutes for urban distances

Pick-up Lockers

Urban Ray's drone-agnostic pick-up lockers minimize process changes for customers and serve as ground-to-air interfaces to ensure short turnaround times. The pick-up lockers feature an intuitive interface that requires no prior training, making it easy for dispatchers to use.

- Holds up to 40 packages
- Occupies the size of one parking space; 3.5 meters high
- Fully automated package handling
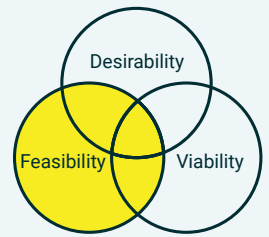
Business Model

Urban Ray's service becomes viable by capturing 80-100% of the goods and samples that need to be transported from the hospital. The model relies on key parameters, such as the number of deliveries, drones per operator, distance, urgency, and weight. The optimal number of flights ranges from a minimum of 5 urgent deliveries per day to a maximum of 30 which is the average for medical deliveries:

Pay-per-Delivery

Charges are based on the market averages for the specific goods being transported.

Subscription Model

Discounts are available for long-term commitments, with options for shared routes.

Consultancy Services

An onboarding service is provided to clients to support operational readiness.

Impact

The reduction in CO2 emissions by the drones varies depending on the route, but on average, drones can reduce emissions by 30 tons per year per route. Additional environmental benefits of the delivery include reduced infrastructure needs, such as fewer labs, parking spaces, driving and storage requirements. The Urban Ray team is also considering the overall sustainability of the drone industry, including the entire lifecycle of drones — such as the recycling and proper management of batteries and other components — to minimize environmental impact. You need a technology mix that solves the problem. Put the customer first, choose the right drone or ground station for each specific use case and make sure it's scalable. This is crucial, and scalability comes from simplicity.

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Conclusion

Urban Ray is advancing urban logistics with secure, scalable pick-up stations and drones designed to meet the specific requirements of urban environments. By leveraging its infrastructure and regulatory approvals, Urban Ray aims to create an efficient, sustainable delivery ecosystem that can adapt to diverse logistics demands.