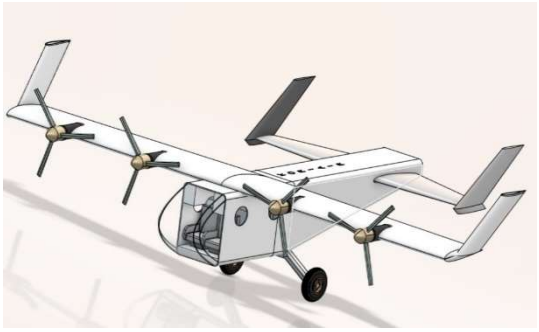
KoriAir

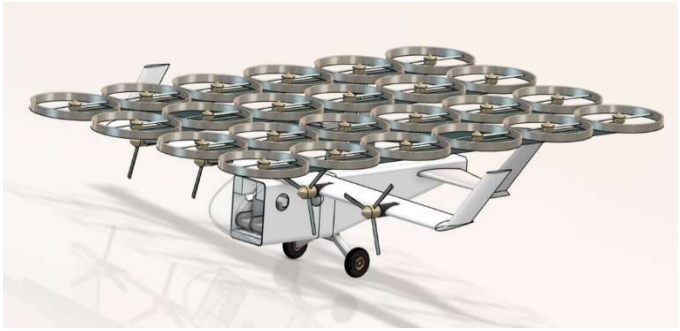
A low emission Urban Air Mobility vehicle

As cities grow and become denser, the need for efficient transportation increases. The desire for a convenient mode of public transportation that covers regional distances is therefore instilled. This gap is filled by the market of Urban Air Mobility (UAM), a type of transport that uses air taxi vehicles capable of vertical take-off and landing (VTOL) covering an inter- or intra-urban range. Current UAM concepts, however, often struggle with noise and efficiency, which decreases their convenience for public usage. The objective of the KoriAir project is ***to design a UAM vehicle and its supporting infrastructure that allow for more efficient and quiet operation than current air taxi vehicles***.

KoriAir will achieve this through its revolutionary two-vehicle configuration, consisting of a lifting vehicle and a cruise vehicle. This design allows for a more efficient cruise, take-off, and landing, as the vehicle that provides vertical flight capabilities decouples from the cruise vehicle once it generates sufficient lift. Hence, the cruise vehicle does not carry the weight of the lifting vehicle. This lifting vehicle is a multicopter, using 24 rotors to generate lift and control. The cruise vehicle is a high-wing aircraft with an H-tail. It can transport four passengers with their luggage and does not have an onboard pilot.

The coupling mechanism between the lifting vehicle and the cruise vehicle is a crucial aspect of the KoriAir project, featuring both a soft and rigid coupling for safety reasons and operational efficiency. Before landing, the soft coupling guides the vehicles towards each other, ensuring a gentle and precise alignment. Once aligned, the rigid coupling engages, creating a secure and stable connection allowing for vertical landing for the two vehicle configuration. After vertical take-off, when the vehicles have reached sufficient horizontal speed, the coupling disengages, allowing the cruise vehicle to start climbing.





The figures above show a rendering of the cruise vehicle, and the lifting and cruise vehicle in their coupled configuration. The tables below summarize some of the characteristic values of the design.

Mission				
Design range	Energy consumption in cruise (incl. loiter)	Power required for take-off	Cruise speed	Payload mass
50 km	**130 MJ**	**200 kW**	**200 km/h**	**420 kg**

Cruise vehicle				**Lifting vehicle**	
Maximum Take-off Weight	Number of propellers	Fuselage length	Wingspan	Maximum Take-off Weight	Number of rotors
1500 kg	**4**	**7.5 m**	**11.6 m**	**900 kg**	**24**