Moller Aeronautics

Answers the question: Where is my flying car?

Moller Aeronautics (MA) is being created to exclusively manufacture, market, and service one and two-person Skycar® air taxis and drone versions called Aerobots®. MA's allied companies developed the revolutionary Rotapower® engines to power vertical take-off and landing (VTOL) air taxis including the two-person Neuera® 200 and four-person Skycar® 400. These engines were also used to power aerobots® that were delivered to the US Army, Navy and Air Force. A key element in the successful test flights of these personal commuter air taxis and drones was the use of "distributed propulsion" patented by Dr Moller. (patent 3614030). All air taxis and most drones in worldwide development utilize distributed propulsion.

Skycar® 400 on ground and in flight

Neuera® 200 on ground and in flight

Why does the world need air taxis

The US, like other parts of the world, has a failing ground-based travel system utilizing automobiles. During the last 20 years travel by car in the US underwent an average increase of 1.9% per year while the total accessible roadway miles increased by only 0.6%. This trend has resulted in most roadways becoming saturated and nearly impossible to use effectively.

Airborne taxi solution

Travel by airborne taxis is being presented as a meaningful alternative to personal travel by automobile. However, most air taxis now under development are for **five- to- seven- person ridesharing** use such as travel between hotel and airport. Morgan Stanley predicts that the advanced air mobility (AAM) market composed of air taxis and drones will total $1 trillion by 2040 and $9 trillion by 2050. Deloitte indicates that this market will see a CAGR of 30.43% between 2025 and 2035. In 2025 over $6 billion may be spent developing five-to-seven-person battery powered ridesharing **air** taxis. Today 78.6 % of automotive trips carry one person, 7.5% carry two persons while ridesharing carries a declining 9%. It is reasonable to assume that autonomous **one and two-person air taxis** and multi-purpose **drones** will make up most of this future $9 trillion market.

Technical issues

Distributed propulsion uses multiple powerplants to safely tolerate a single powerplant failure. Collectively these powerplants must produce the very high power required to take off and land vertically (VTOL). A one-person Skycar® 100 air taxi can weigh 1000 lbs and require 500 installed horsepower to tolerate a powerplant failure during VTOL or while transitioning to cruise. (Skycar® 100 Specifications). Batteries/motors have the necessary high power to weight ratio but have little stored energy per pound. Consequently, the range of battery powered air taxis may be less than 50 miles (Review of selected advanced air mobility aircraft). Fuel has 50 times more energy per pound, however, the lightest piston

engine for use in aviation produces less than **one horsepower per pound.** Therefore, it is not viable as the sole power source for an air taxi during VTOL and transition to cruise.

Air taxis will need to address numerous design and performance requirements to provide maximum utility as a personal air taxi in an urban environment. These include:

- Smaller than a city parking space with wings folded (less than 18ft long and10ft wide).
- Use carbon free or carbon neutral fuel powered engines during cruise assisted by battery powered motors during VTOL and transition (eVTOL).
- Meet city noise ordinance (88 dba@25 ft).
- Effective cruise speed (200 mph).
- Automotive range (500 miles).
- Initial FAA approval under some form of the special light sports aviation category (SLSA).
- Subsequent FAA certification to operate commercially under Part 135.
- Operate autonomously (expected by 2030).

Skycar® solution

The **Rotapower® engine** developed by Freedom Motors is used exclusively by MA, provides **over three horsepower per pound** making a VTOL capable air taxi powered only by engines viable. However, also using battery powered motors [hybrid version], help provide boost and back-up power during VTOL and transition. One and two-person air taxis can potentially meet the above requirements while five-to-seven-person air taxis powered only by batteries will have difficulty meeting most of them.

Skycar® 100X

Skycar® 200

Economics of travel by autonomous air taxis

For Skycar® and other one and two-person air taxis to make up a large portion of the projected $1 trillion AAM market by 2040, production may need to approach present automotive levels. Economy of scale could then reduce the selling price to around $100,000 in today's dollars and result in a trip cost either as an owner or autonomous air taxi user in the range of $1 per passenger mile. By contrast, five-to-seven-person ridesharing air taxis may have a trip cost of $5 to $7 per passenger mile that is unlikely to decrease due to their limited utility and resulting high production cost. (The Future of Advanced Air Mobility Aircraft).

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