Over 150 teams are building aerial taxis - so what's the problem?
The Vision – 1962

Vehicle Concepts

Single Phase

- Range
- Speed
- Simplicity

Dual Phase

- Range
- Speed
- Simplicity

Transition Phase

- Range
- Speed
- Simplicity

Reference: “The Future of Vertical Mobility”, Porsche Consulting Group
Challenges
First Challenge: Public Acceptance
Opportunity: Market Need
Second Challenge: Operating Complexity
Highly Complex Systems

Limited Space

Limited Weight

Limited Cost
Opportunity: Automated Driving

Source: https://www.tesla.com/de_DE/autopilot

Source: https://electrek.co/2018/10/15/tesla-new-autopilot-neural-net-v9/
Third Challenge: Electric Propulsion
Batteries

Power Electronics
Opportunity: Electric Mobility

- Modern High Power Semiconductors
- Battery Capacities
- Electric Motors
# Electric Motor vs. Combustion Engine

<table>
<thead>
<tr>
<th>Electric Motor with 42 kW</th>
<th>42 kW Combustion Engine</th>
</tr>
</thead>
<tbody>
<tr>
<td>~95 % Efficiency</td>
<td>~30 % Efficiency</td>
</tr>
<tr>
<td>20 kg</td>
<td>85 kg</td>
</tr>
<tr>
<td>~ 250 Parts</td>
<td>~ 2500 Parts</td>
</tr>
<tr>
<td>Low Costs</td>
<td>High Costs</td>
</tr>
</tbody>
</table>
Fourth Challenge: Flight Control System
Safety and Reliability

- Size
- Weight
- Cost
Opportunity: Development Methods

Model-based Development

Certified Toolchain
Opportunity: Computing Power

- **Apollo 11 Guidance Computer (1966)**: 5.6k Transistors
- **Atmega 328 (Arduino)**: 42k Transistors
- **Apple A12 Bionic**: 6.9bn Transistors
AutoFlightX V600
Founding of AutoFlightX: 02/2018
Project start of the V600: 05/2018
Unveiling of V600: 04/2019
First fixed-wing flight: Summer 2019
First manned transition: Later
<table>
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<th>Opportunity</th>
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<td>Operating Complexity</td>
<td>Automated Driving</td>
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<tr>
<td>Electric Propulsion</td>
<td>Semiconductors / Batteries / Motors</td>
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