Electra.aero Overview

AUVSI Hampton Roads – AAM Expo

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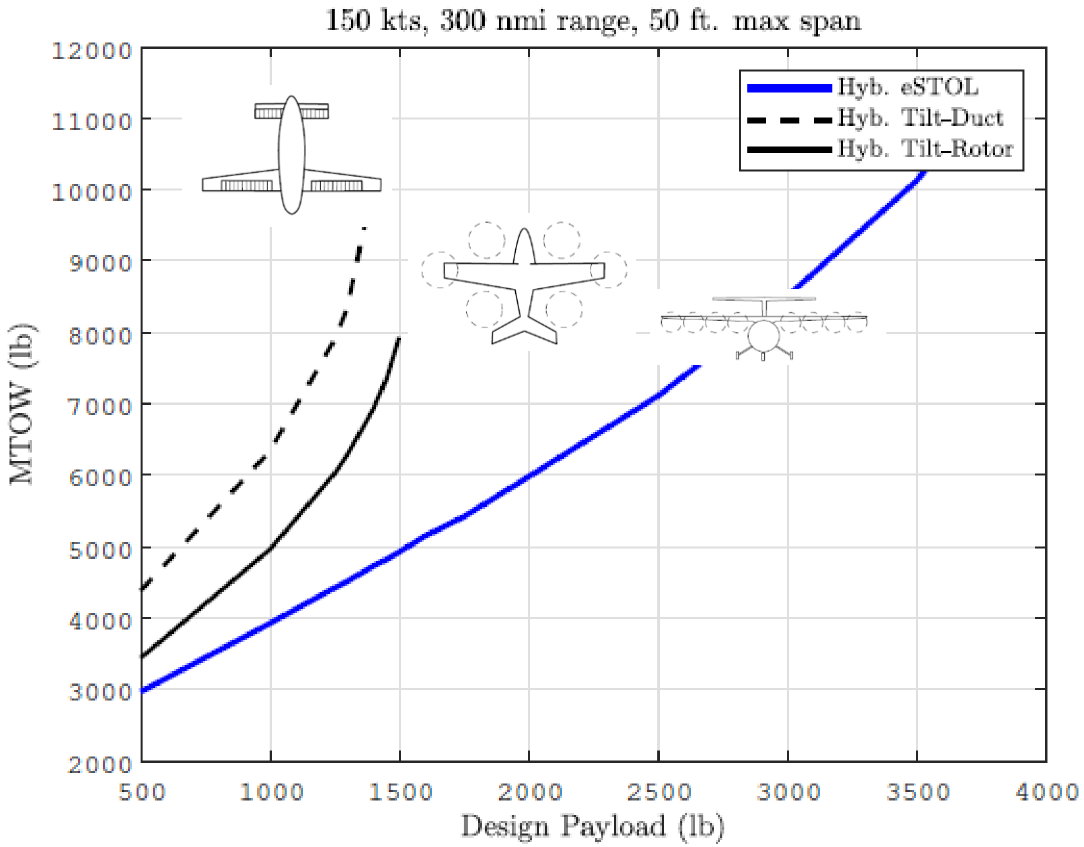
Relaxing the VTOL requirement results in major performance and cost improvements

Results from a recent MIT paper entitled, "A Performance Comparison of eSTOL and eVTOL Aircraft" published by the American Institute of Aeronautics & Astronautics

<u>*Constant 6000 lb GTOW*</u>

	Tilt-Duct eVTOL	Tilt-Rotor eVTOL	eSTOL
All-electric			
Payload (lb)	668	784	1527
Payload Multiplier	**1.0**	**1.2**	**2.3**
Hybrid-electric			
Payload (lb)	767	1116	1970
Payload Multiplier	**1.0**	**1.5**	**2.6**

An eSTOL aircraft leverages a few hundred feet of runway (vs VTOL) to achieve nearly 3x more payload capacity; hybridization brings over 10x more range (vs all-electric)



Battery specific energy	250 Wh/kg
Range (all-electric)	75 nmi
Range (hybrid-electric)	300 nmi (+45 min reserves)

eSTOL sized for 150-ft takeoff, 100-ft landing ground rolls

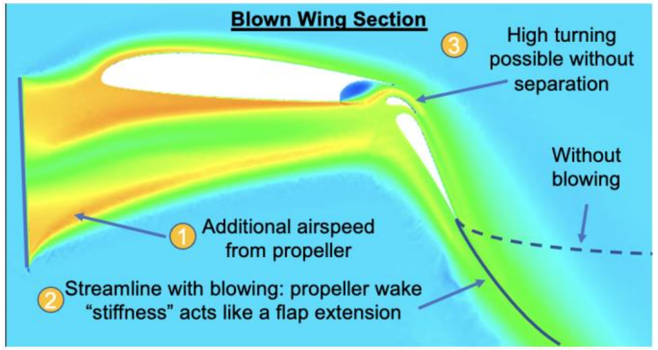
Electric propulsion makes STOL aircraft practical

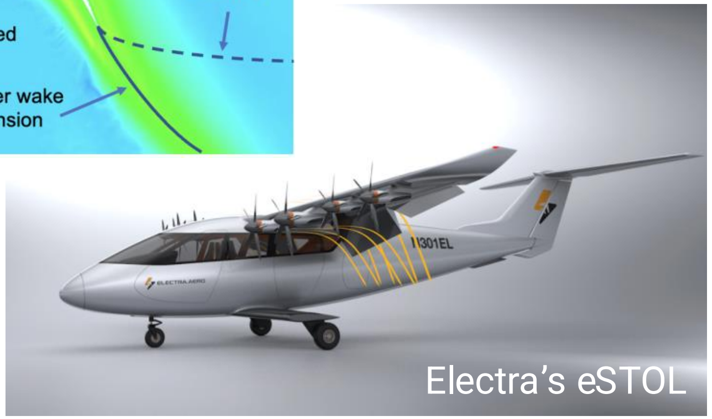
Designs of the past established that a fixed wing aircraft can operate from spaces only a few "vehicle lengths" in distance

However:

- A lot of work to fly
- Taking off short is easy;
  landing short – accurately – is much harder
- Traditional engines not ideal for blown lift designs

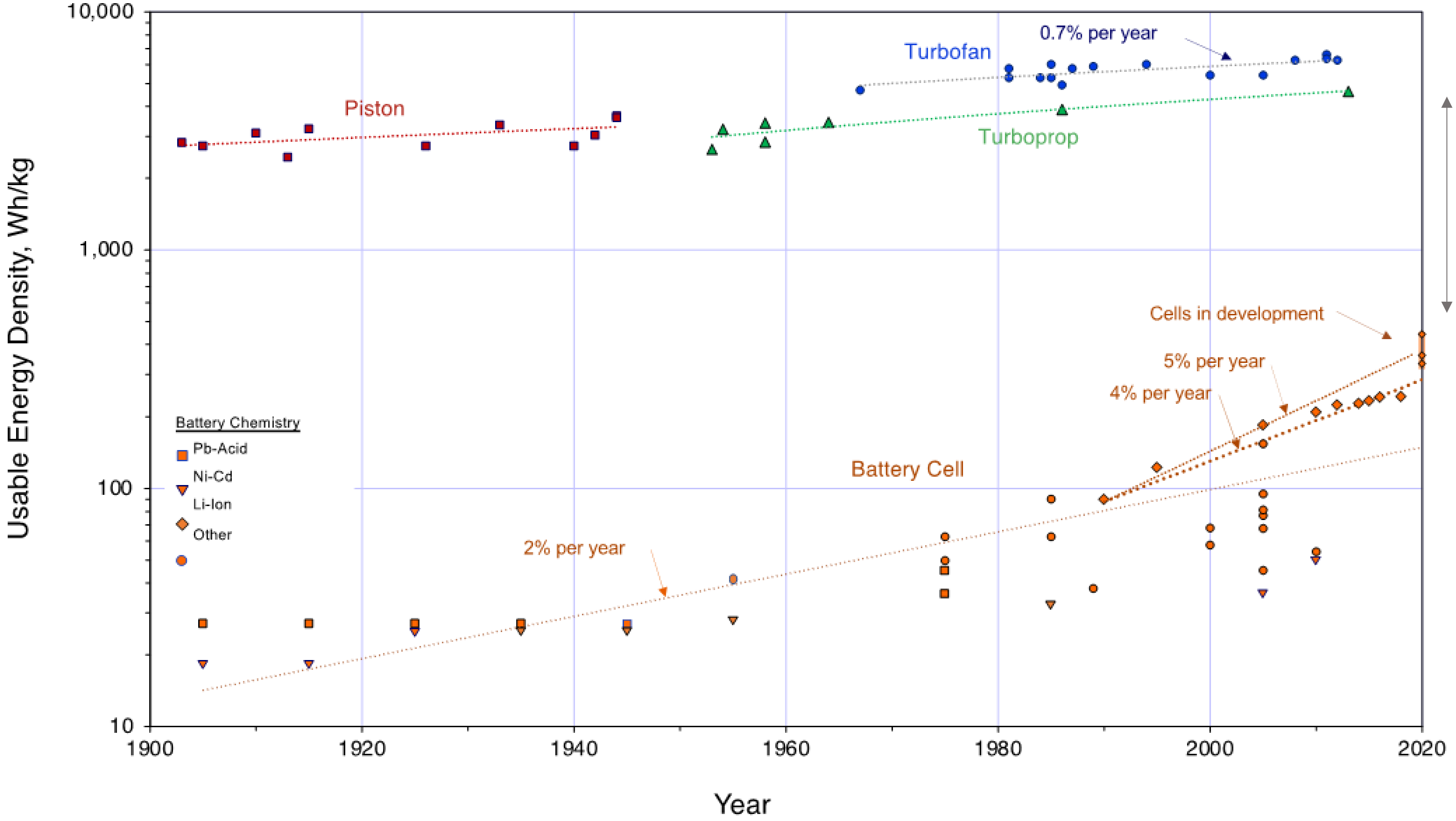
Distributed Electric Propulsion addresses the historical challenges to practical STOL aircraft





- Can optimally blow the wing across the entire span with electric propulsors → increases lift coefficient by 3x
- Fly-by-wire and differential thrust for slow-speed flight control authority
- Land within 300 x 100 ft spaces

Why hybrid-electric?



Factor 10-20 gap (considering efficiency)

ELECTRA Hybrid eSTOL Aircraft

09 Passengers

Payload **2500** lbs

150 FT
Takeoff Distance

Quiet
Operations

175 KTS
Cruise Speed

400 NM + reserve
1,100 NM ferry range

Generous
Cabin Size

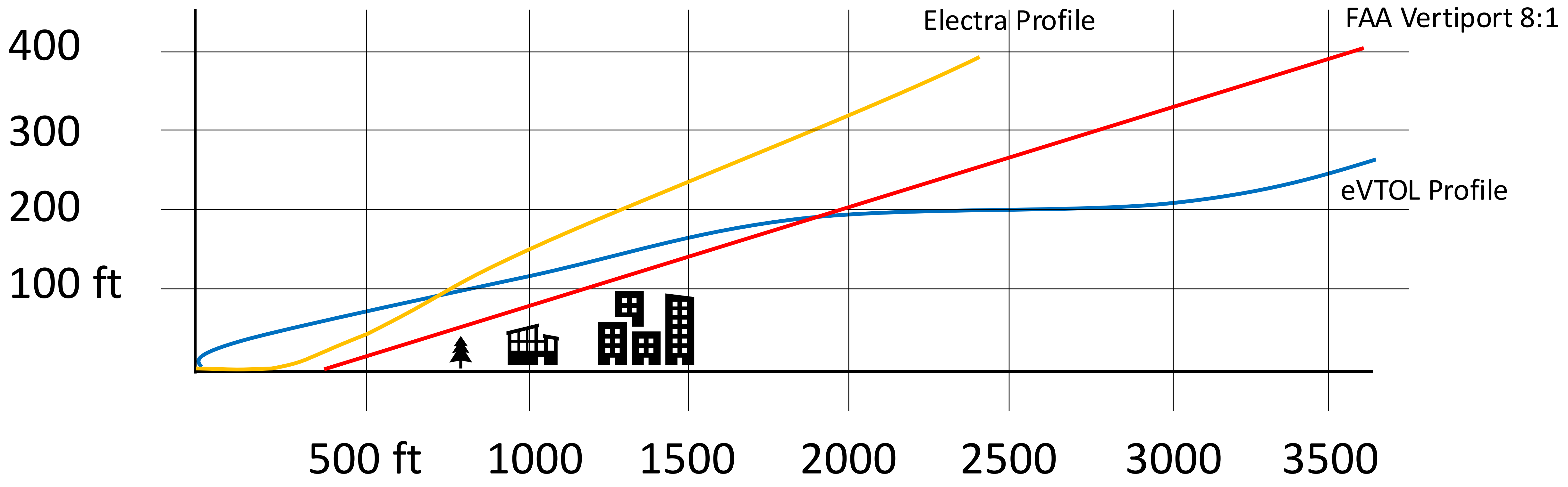
FIKI
Known Icing

Net Zero
Emissions

Low Maintenance
Cost


Takeoff &
Landing Distance
150 ft
Take-Off &
Landing Distance
50 ft
9° glideslope
0
150
300
500
STOLport Size (ft)

DoT AAM RFI – eVTOL departure profile comparison



Our departure profile exceeds eVTOL profiles

FAA Vertiport Design: https://www.faa.gov/sites/faa.gov/files/eb-105-vertiports.pdf
eVTOL Profile: https://ntrs.nasa.gov/citations/20220006729

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