



MINI BEE

PERSONAL AIRCRAFT

Agenda : Mini-Bee TRL2 description

- TRL2 Partners
- Concept and technical description
- Cabine configurations
- Vehicule and system description
- Project actions

Annexes :

- State of the art
- Other innovative projects

Mini-Bee : 2PAX VTOL Hybrid



TECHNOPLANE

MINIBEE

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Mini-Bee Project partners



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Coordinator :



Universities :



POLITECNICO
DI TORINO



Institution & financial partners :



Design:



MINI BEE

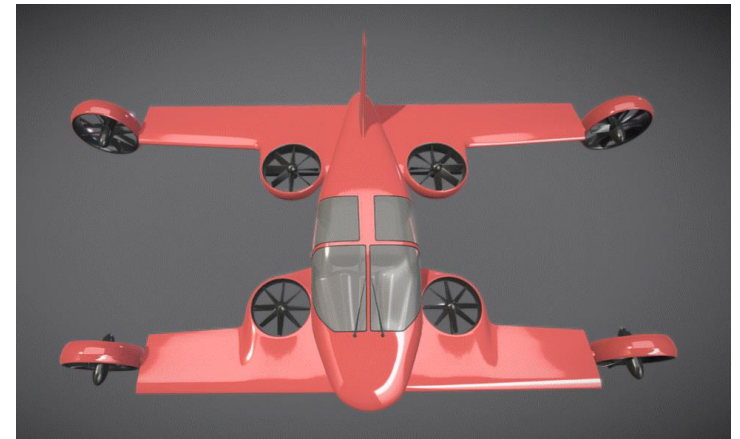
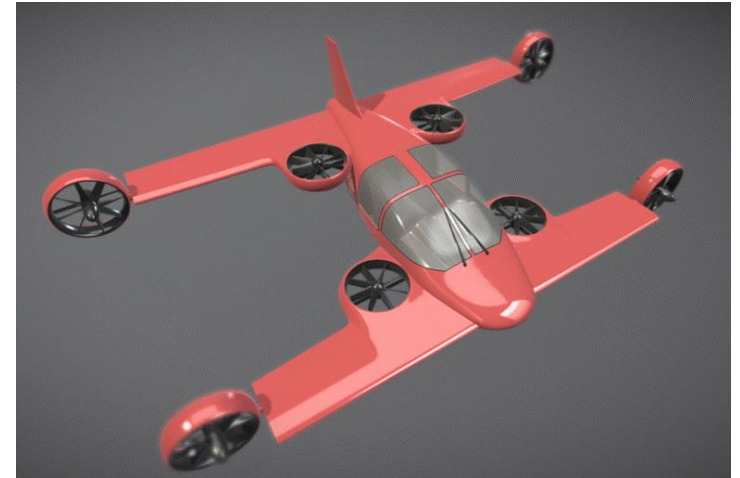
PERSONAL AIRCRAFT

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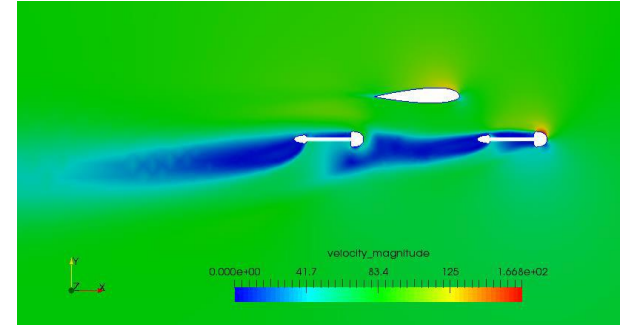
Mini-Bee description

- Project state : TRL2
 - Electric octocopter : 4 vertical + 4 tilt
 - Hybrid energy : fuel + batteries
 - 2-3 seats
- Characteristics :
 - VTOL capacity, short wings, 1.2 ton
 - Range 600km, max speed 300km/h
 - Electric controls and engines
 - « Car like » interface
- Goals and market
 - VIP, Taxi, Air Ambulance
 - Estimated price 1m€ (0,7 to 2m€)



Take-off and flight transition

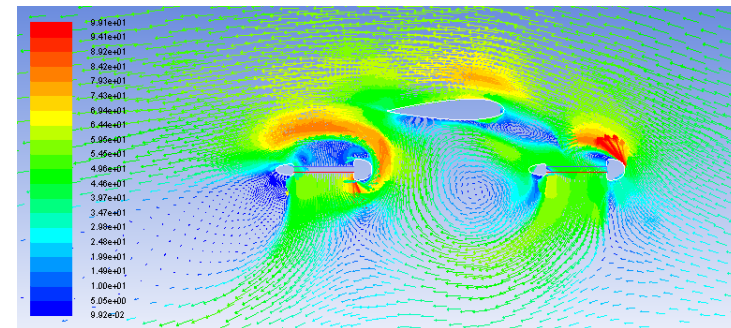
Cruise
flight



Tilt
transition

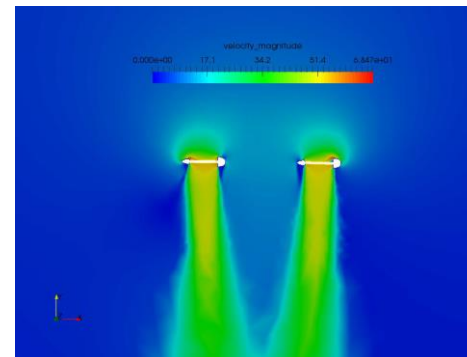


Estaca 2016



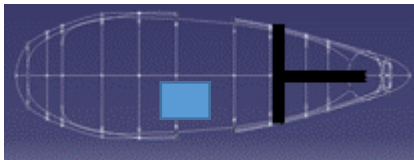
Supméca 2016

Vertical
take-off

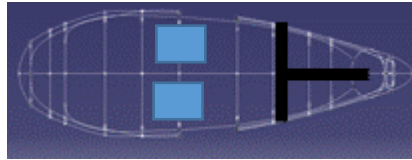


Cabine configurations

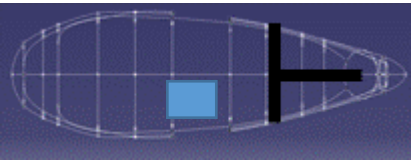
Sport



VIP



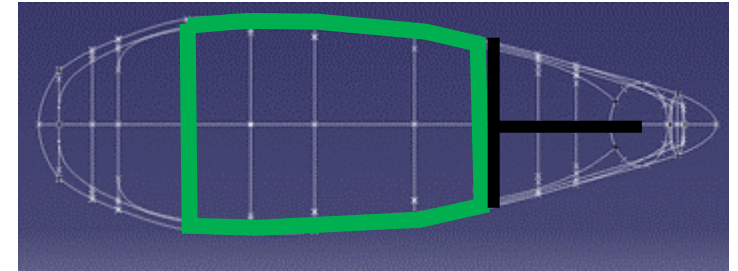
Utilities



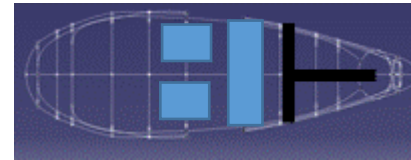
1 PAX



2 PAX

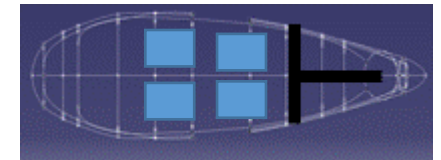


Ambulance



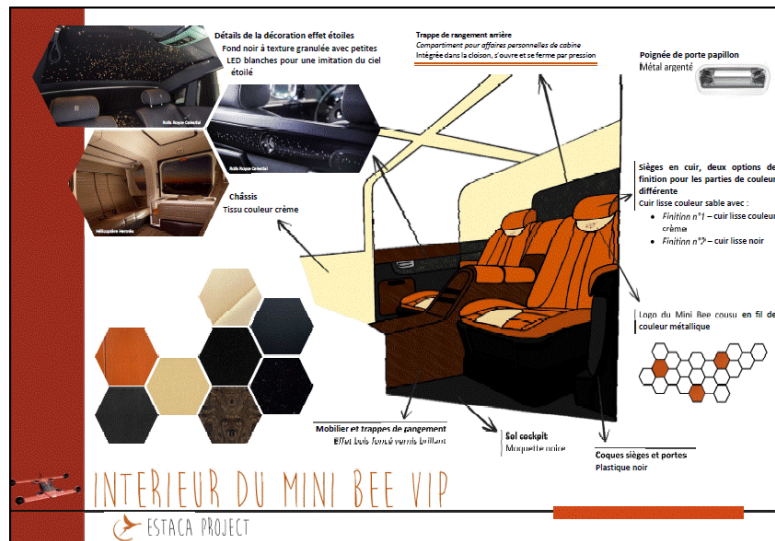
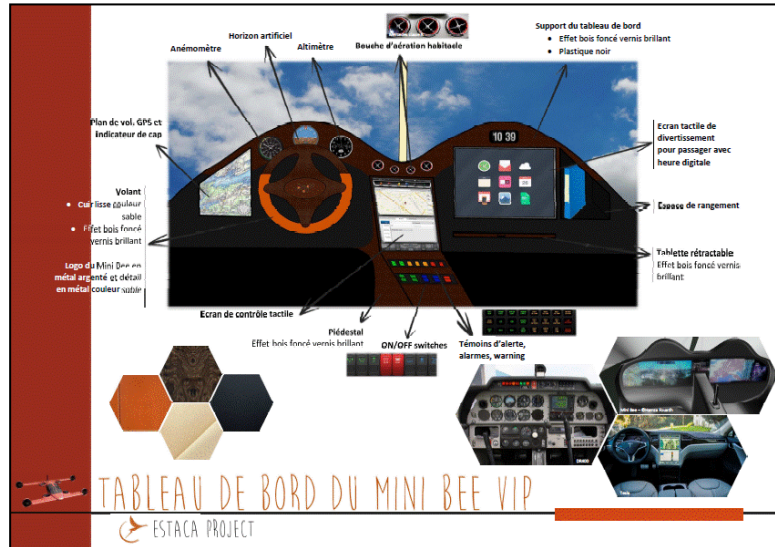
3 PAX

Taxi



4 PAX (light)

VIP Configuration



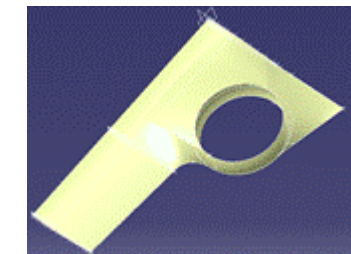
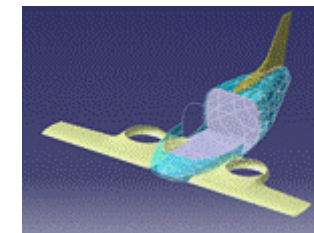
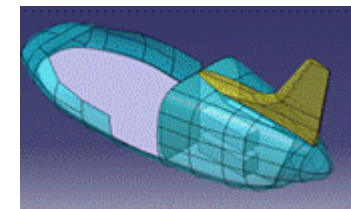
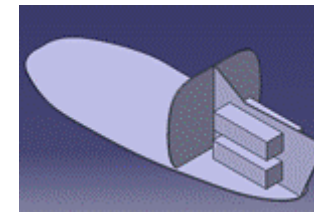
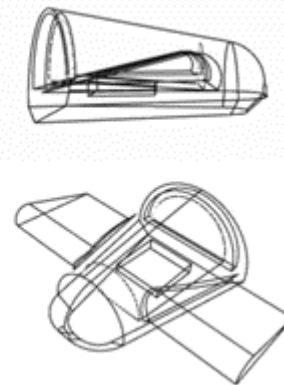
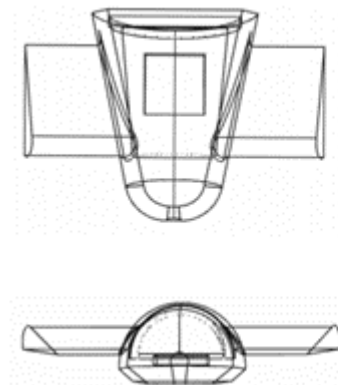
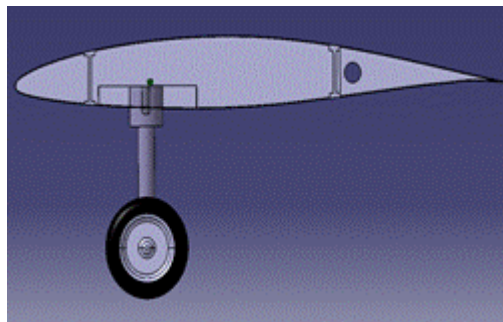
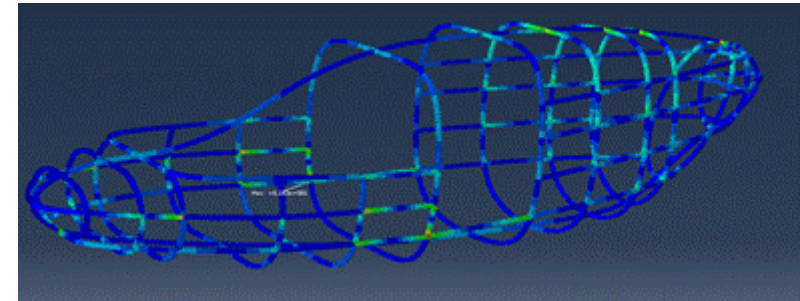
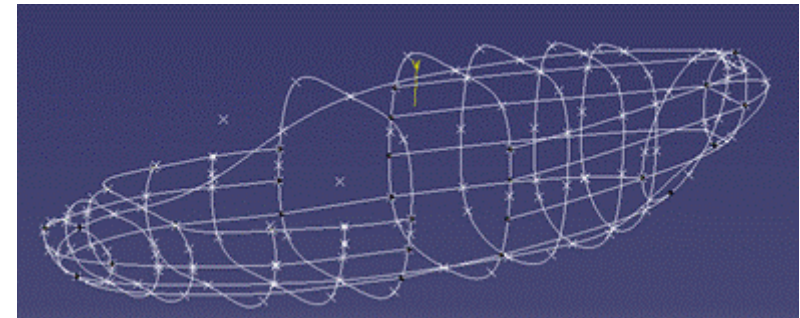
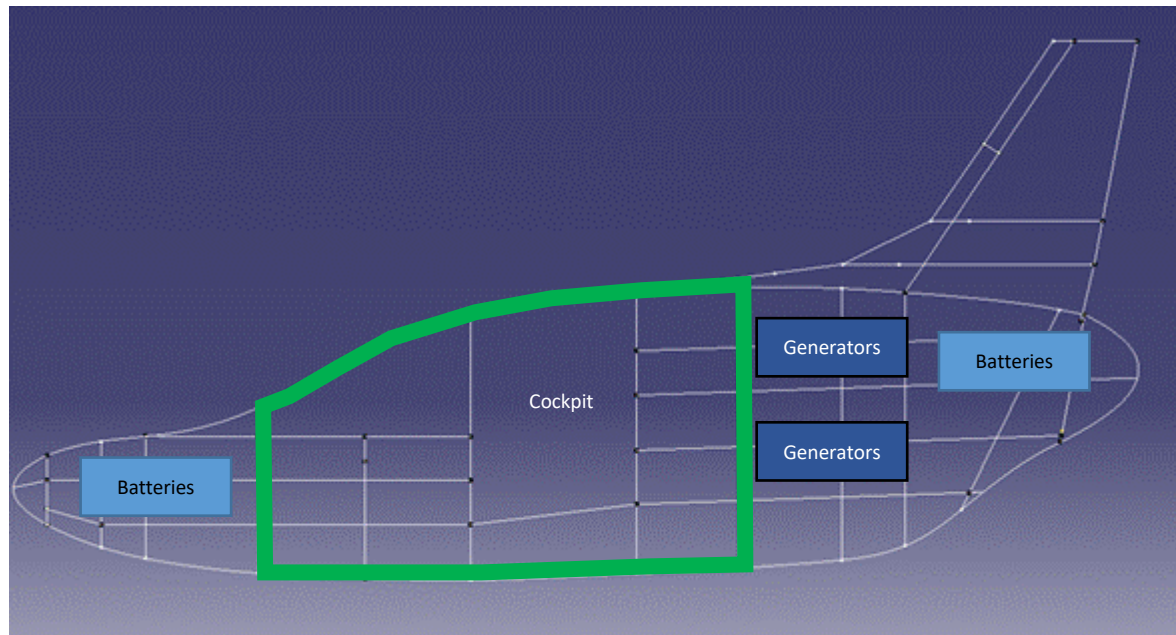
2 PAX (heavy)
Long wings
Retractable landing gear

Taxi configuration

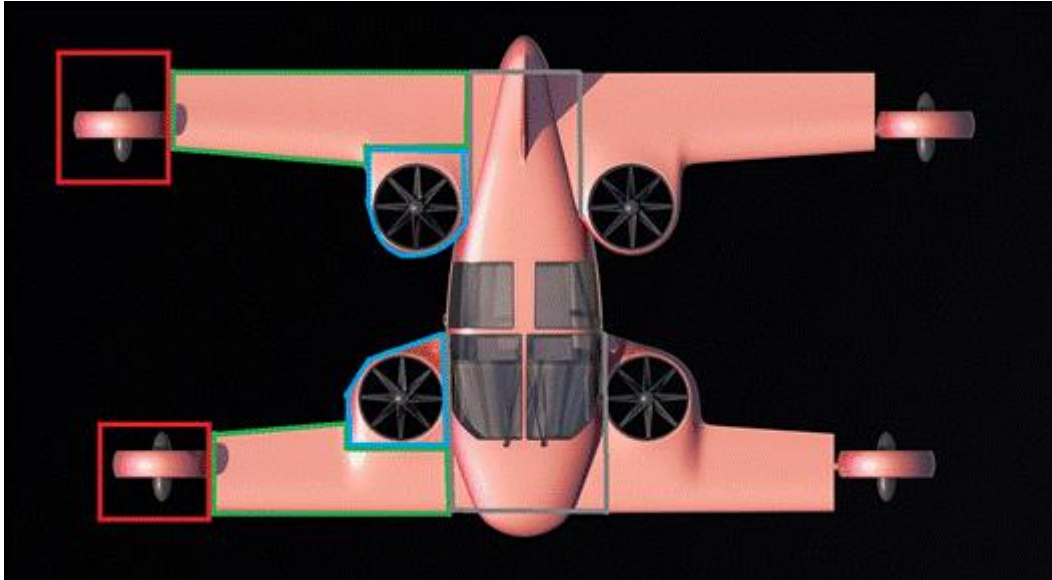


2 to 4 PAX (light), shorts wings, fixed landing gear

Structural architecture

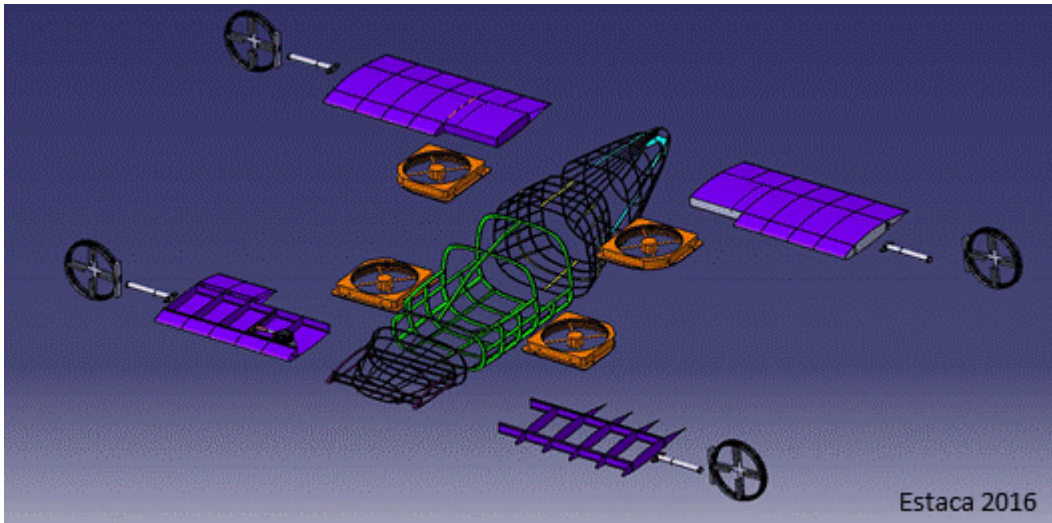
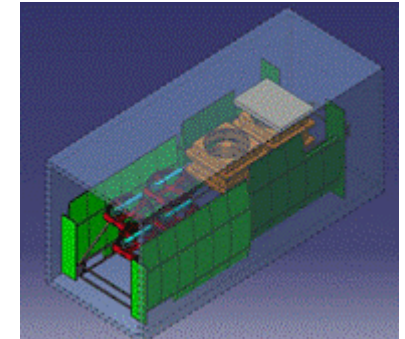


Modular structure



Production, delivery
and MRO optimization

Delivery in 20' Container



2 main flight
configurations

Taxi :

- VTOL Short intra city
- Short wings, high NACA
- Vertical central engines
- Fixed landing gear

VIP :

- VTOL + cruise
- Longuer wings
- Fuel capacities
- Retractable landing gear

Actions for Mini-Bee TRL2 Project

- Mini-Bee TRL2 tasks :
 - Refine detailed technical and equipment configuration
 - Evaluate market opportunities, production and flight costs
 - Define partnership for TRL2 and TRL3
 - Draw project financial path
 - Investigate for lovemoney phase

Financial project path

TRL	Statut	Début	Fin	Montant estimé (k€)
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0	Terminé	2014	2015	20
1	Terminé	2015	2016	50
2	En cours	2016	2017	200
3		2017	2019	2 000
4				5 000
5				10 000
6				15 000
7				20 000
8				25 000
9				25 000

Detailed numerical mock-up

First flight

Test flights

Final developments

Qualification

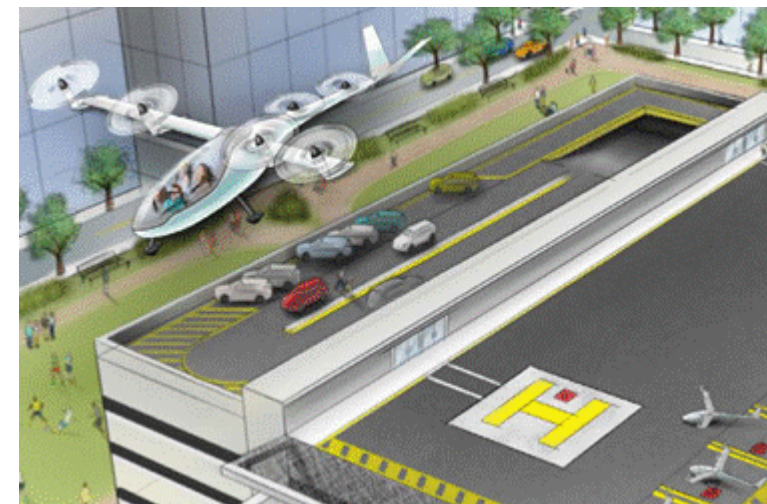
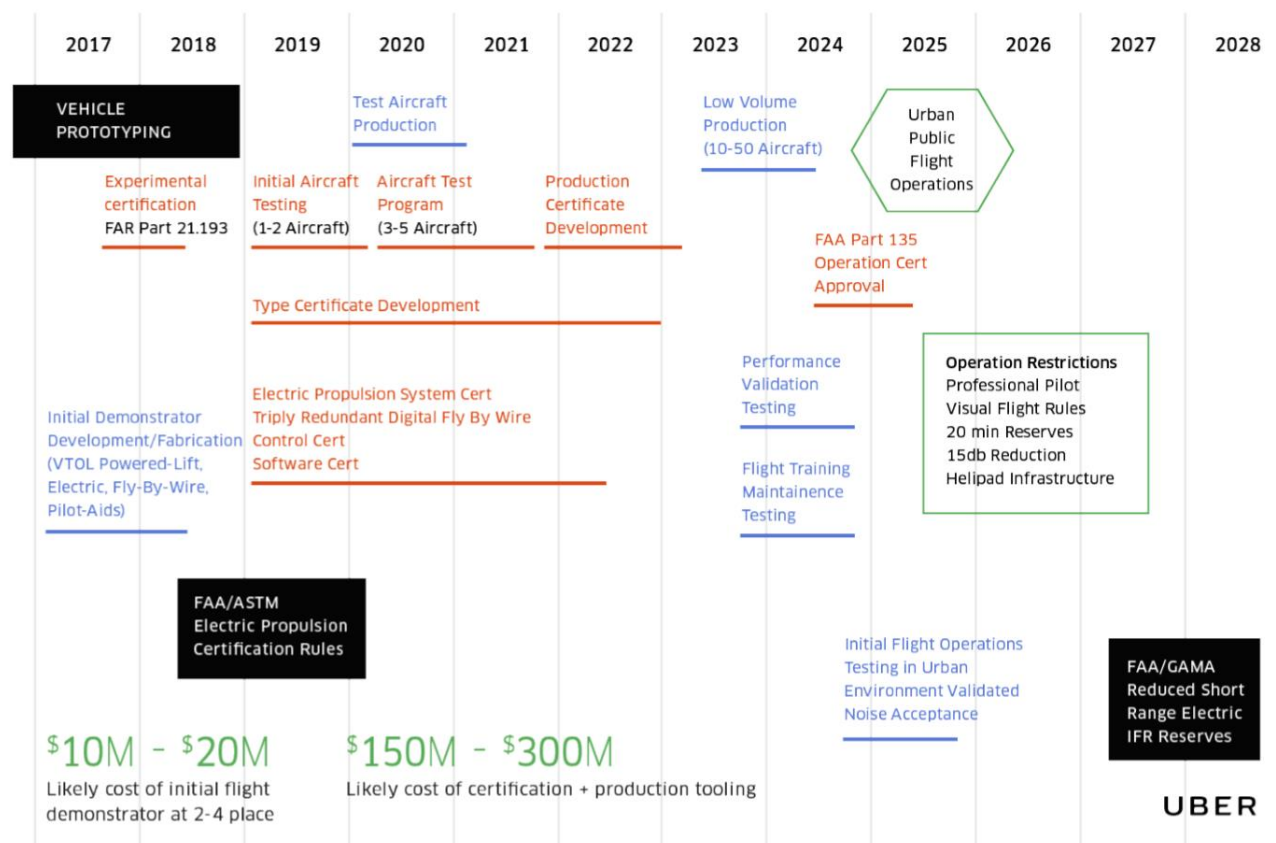
Commercialisation / Operations

Estimated overall project 100m€

Actual step : Lovemoney for 500k€ to 2m€

Uber Elevate planning

Certification



Annexes

Individual Air Vehicules

State of the art

Cessna Skylane



- Height: 2,84 m
- Wingspan: 10,97 m
- Length: 8,84 m
- Max Take-Off Weight: 1406 Kg
- Power: 230 hp
- Engine: lycoming IO-540-AB-1A5
- Maximum speed: 269 Km/h
- Range: 1695 Km
- Price: 277 300 \$

Robinson R44



- Height: 3,3 m
- Rotor diameter: 10,1 m
- Length: 11,7 m
- Max Take-Off Weight: 1089 Kg
- Power: 248 hp
- Engine: lycoming IO-540-AE1A5
- Maximum speed: 240 Km/h
- Range: 560 Km
- Price: 456 000 \$

X3 airbus



Osprey V22



Cessna TTX



- Height: 2,74 m
- Wingspan: 10,97 m
- Length: 7,68 m
- Max Take-Off Weight: 1633 Kg
- Power: 310 hp
- Engine: turbo TSIO-550-c
- Maximum Speed: 435 Km/h
- Range: 2315 Km
- Price: 733 950 \$

Agusta Westland AW609



- Height: 5,1-6,6 m
- Wingspan: 11,7 m
- Length: 13,3 m
- Max Take-Off Weight: 7200 Kg
- Power: 1900 hp
- Engine: Pratt & Whitney Canada PT6C-67A
- Maximum speed: 616 Km/h
- Range: 1390 Km
- Price: 10 000 000 \$

Airbus H160



Aeromobil 3.0



- Height: 1,50 m
- Wingspan: 8,32 m
- Length: 6 m
- Power: 81 hp
- Engine: rotax 912
- Maximum speed: 200 Km/h
- Range: 700 Km

Ecureuil



X2



Other innovative projects



Trifan 600 XTI (2015)



Helium (2016)



Agusta Westland
Zero (2015)



Airbus E-fan (2015)



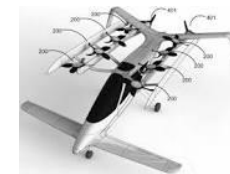
E-volo (<2014)



eHang (fin 2015)



Kitty Hawk (2016)



zee.aero (2016)



Joby (2016) ~ 100m€



Moler skycar
(<2016)



Urban aeronautics
(<2016)



Xplorair (2016)



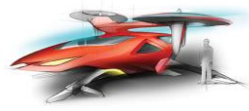
Lilium (2016) ~10m€



SoloTrek Springtail



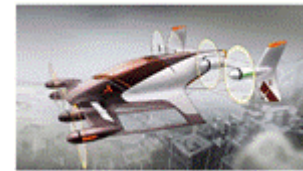
Airbus (2016)



Boeing (2016)



Macro industrie (2016)



Airbus Vahana (2016)



Trekaero.com



Olympus (2016)



Mini-Bee (2016)

Mini-Bee

Hybrid Octocopter



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