Conceptual Design of a Low-Cost Training Helicopter

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Objective of Thesis

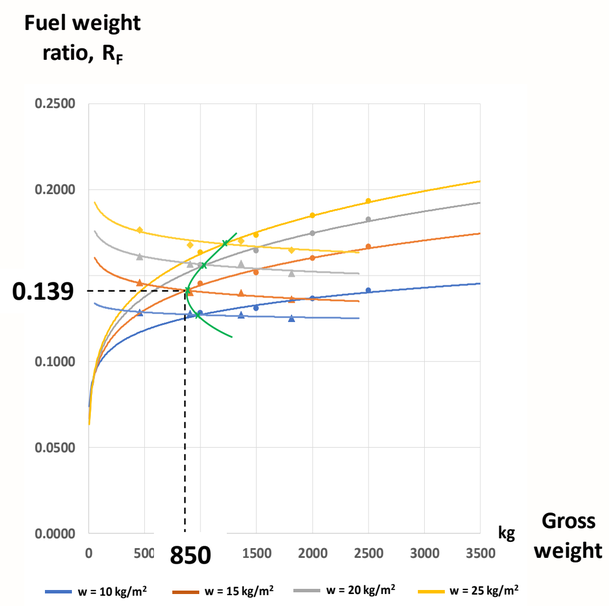
- To design a concept helicopter that is **low in cost** and **suitable for training**

Research Approach

- Use a set of performance requirements to conduct **parametric analysis** and determine possible design configurations

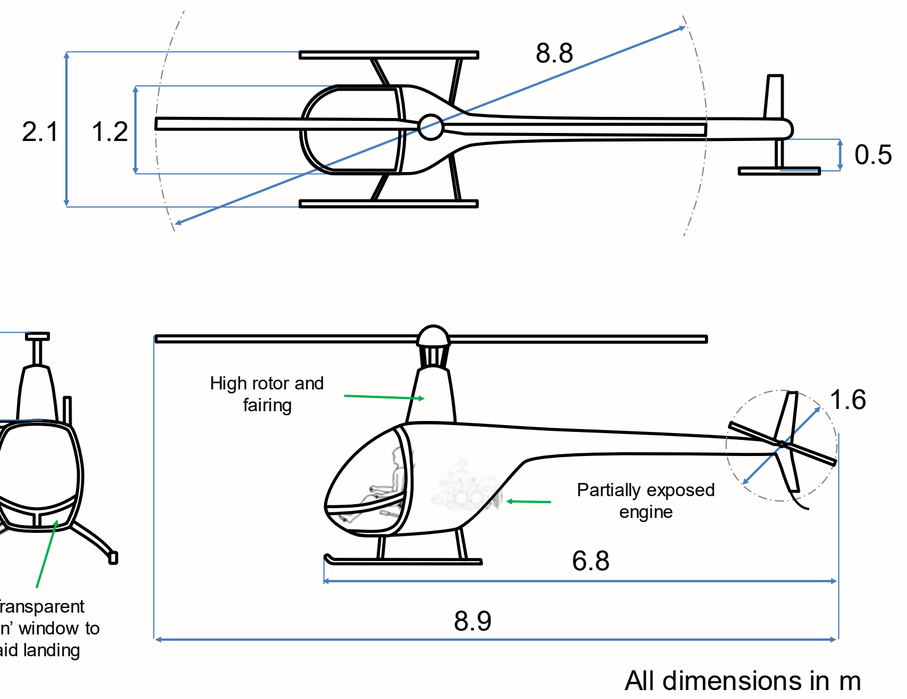
Results

- A concept helicopter was developed, and its **performance and cost are deemed to be comparable** to existing market favourites



Parametric analysis

Components	Parameter	Specifications
Main rotor	Radius	4.4 m
	Tip speed	213 m/s
	Solidity	0.036
	Chord	0.25 m
	Number of rotor blades	2
	Airfoil	NACA 0015
	Direction of rotation	Anti-clockwise (view from above)
Tail rotor	Radius	0.792 m
	Tip speed	213 m/s
	Solidity	0.0996
	Chord	0.124 m
	Number of rotor blades	2
	Airfoil	NACA 0015
	Direction of rotation	Bottom blade advancing
Engine	Type	Reciprocating (Lycoming O-360)
	Power at sea level	134.2 kW
Fuselage	Length	6.36 m
	Width	1.2 m
Landing gear	Type	Fixed skids



General layout of concept helicopter

Innovative T-bar flight controls used by Robinson helicopters

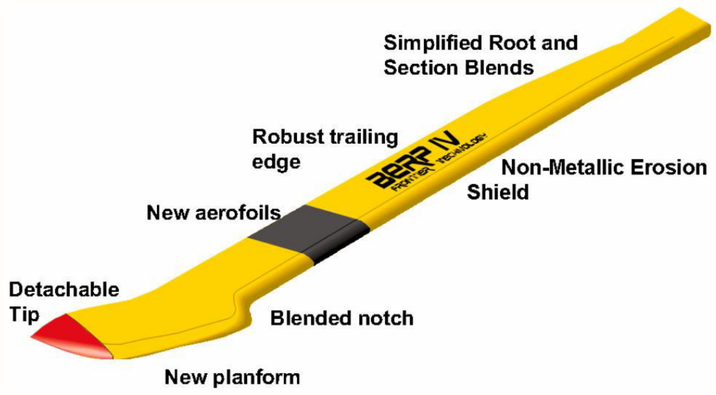
Estimated acquisition cost: **$283,928**

Benefits

- Incentivise labour market to **increase pool of private-license pilots**
- **Reduce operating cost** of companies that conduct in-house pilot training

Future Work

- **Update weight estimation** equations used in the parametric analysis
- Assess performance and cost of **British Experimental Rotor Program (BERP) rotor blade**
- Assess performance and cost of **diesel piston engines**



Innovative BERP rotor blade