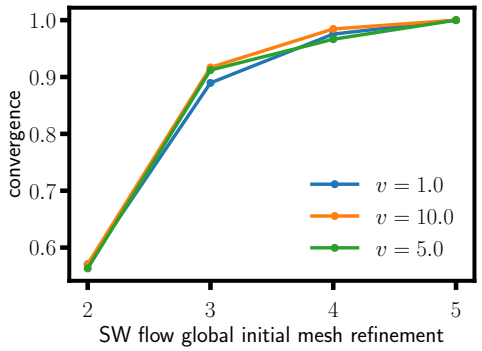
Aerodynamic simulation in SolidWorks Flow dink

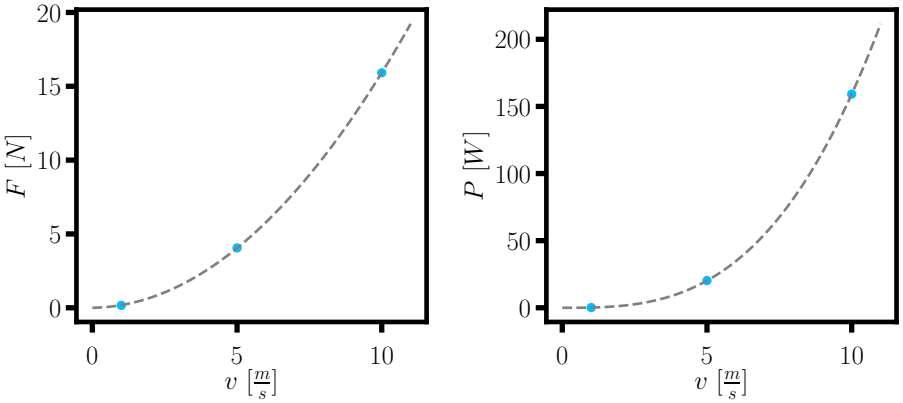
Solidworks flow simulation for a simplified version of the tandem trike (simple wheels, no chairs). Increased "global initial mesh refinement" until results converge.
It is clear that predicted force F, and power P calculated by $P = Fv$ is low by a factor ≈ 3.

	Drag (N)
no roof	15.9
flat roof	17.0
curved roof	19.1
curved roof and sidefenders	18.5
covered front	34.3
covered front and sidefenders	30.6

Table 1: Drag force for wind speed of 10m/s, for different roof shapes



Sideview velocity contour plots



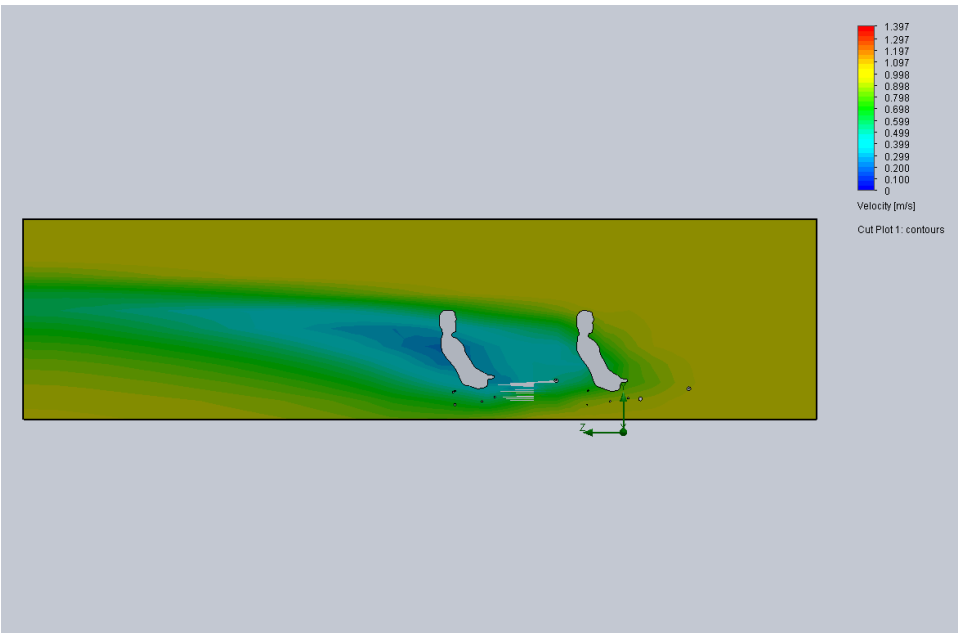


Figure 1: $v = 1m/s$, global initial mesh = 2

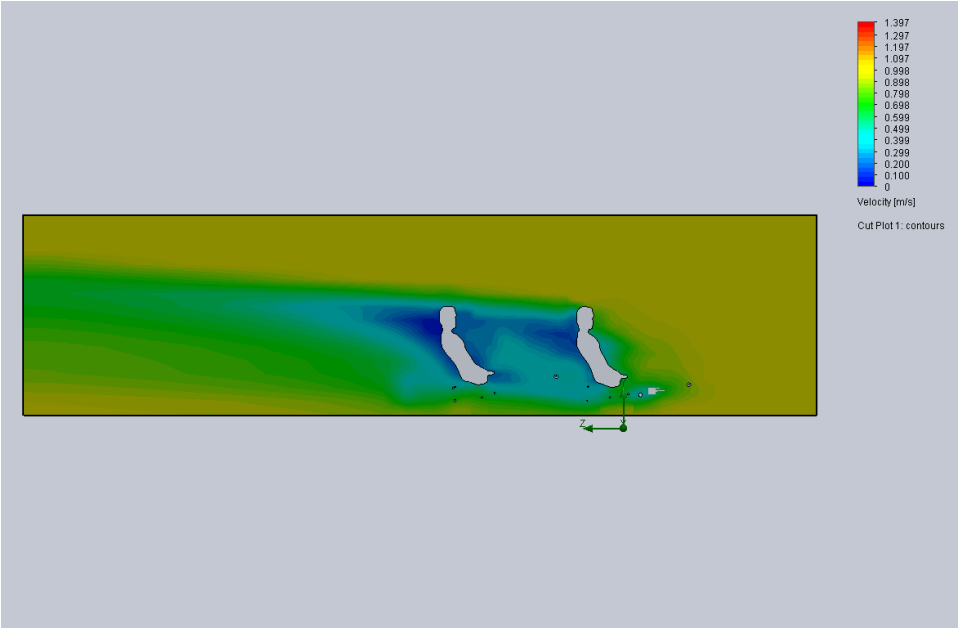


Figure 2: $v = 1m/s$, global initial mesh = 3

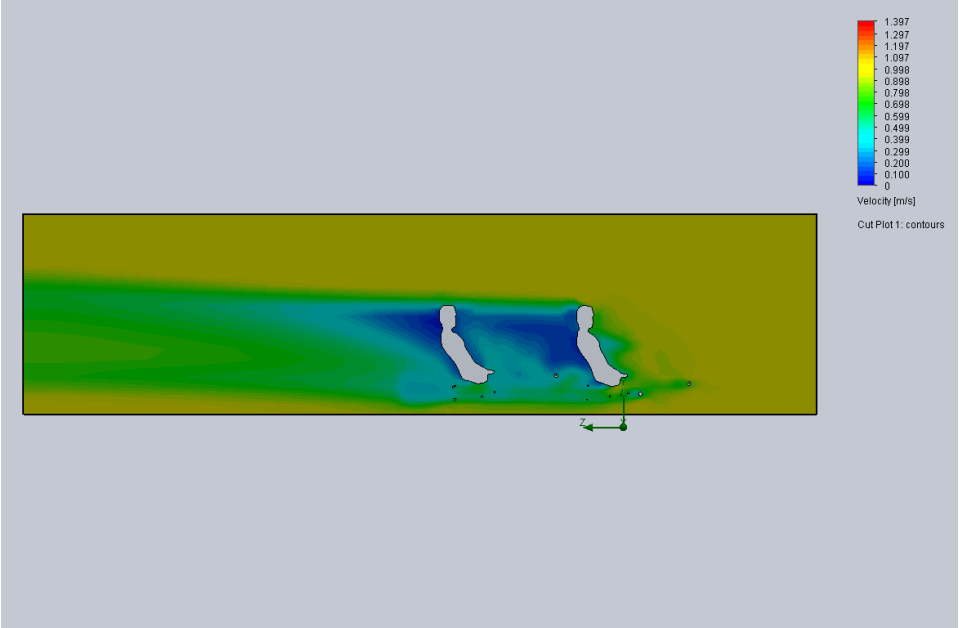


Figure 3: $v = 1m/s$, global initial mesh = 4

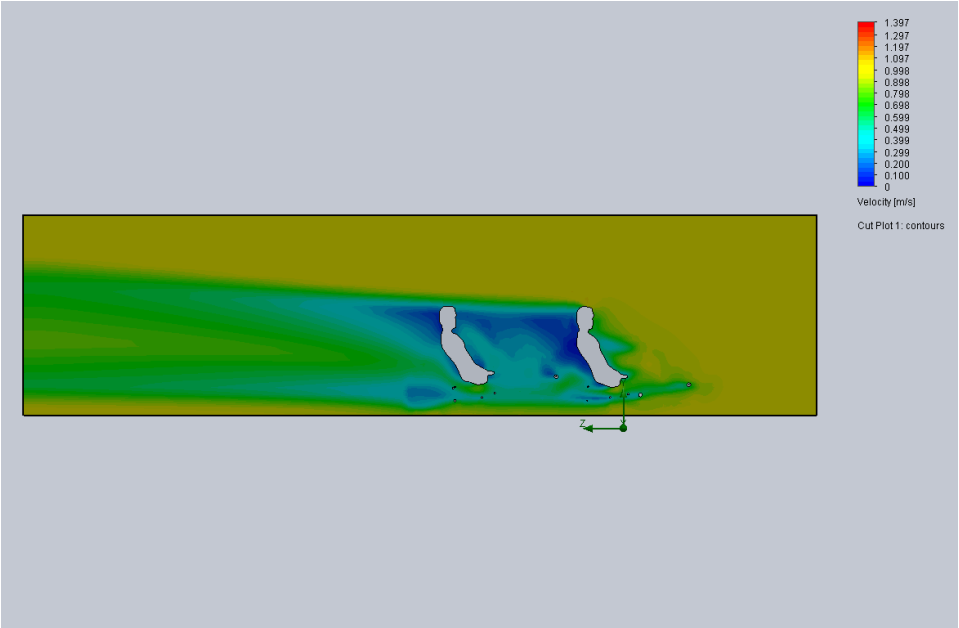


Figure 4: $v = 1m/s$, global initial mesh = 5

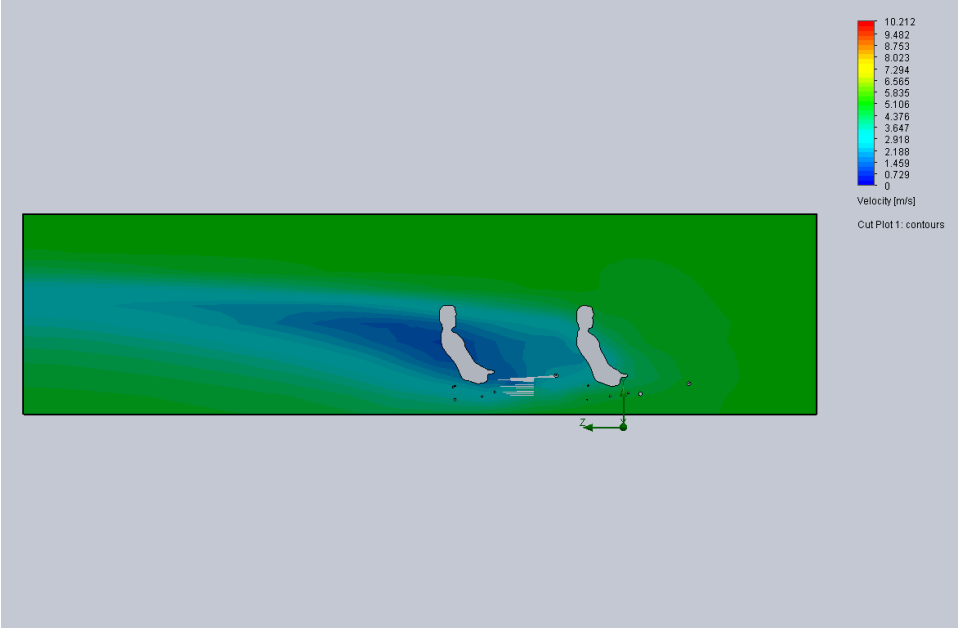


Figure 5: $v = 5m/s$, global initial mesh = 2

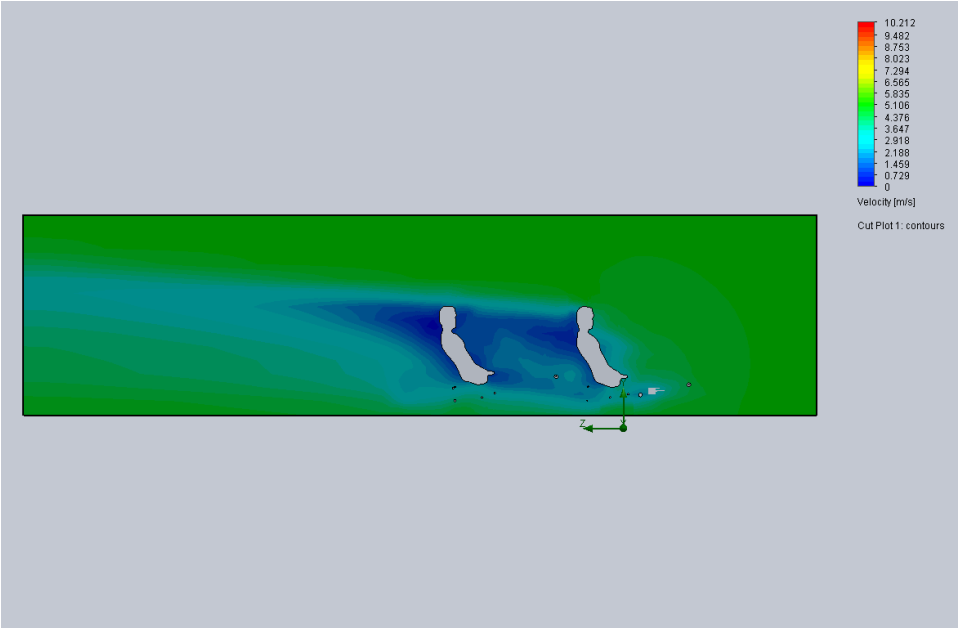


Figure 6: $v = 5m/s$, global initial mesh = 3

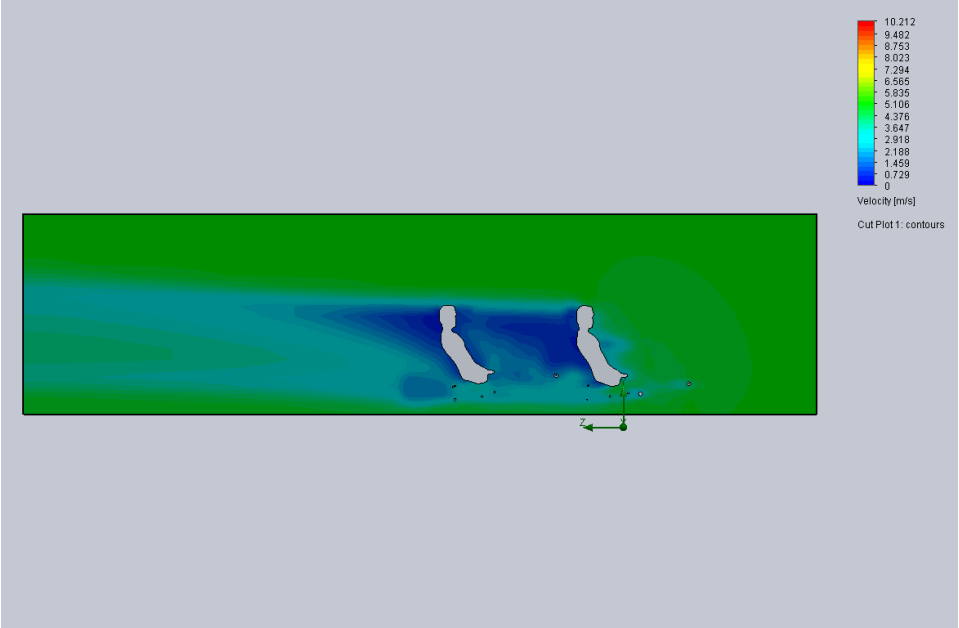


Figure 7: $v = 5m/s$, global initial mesh = 4

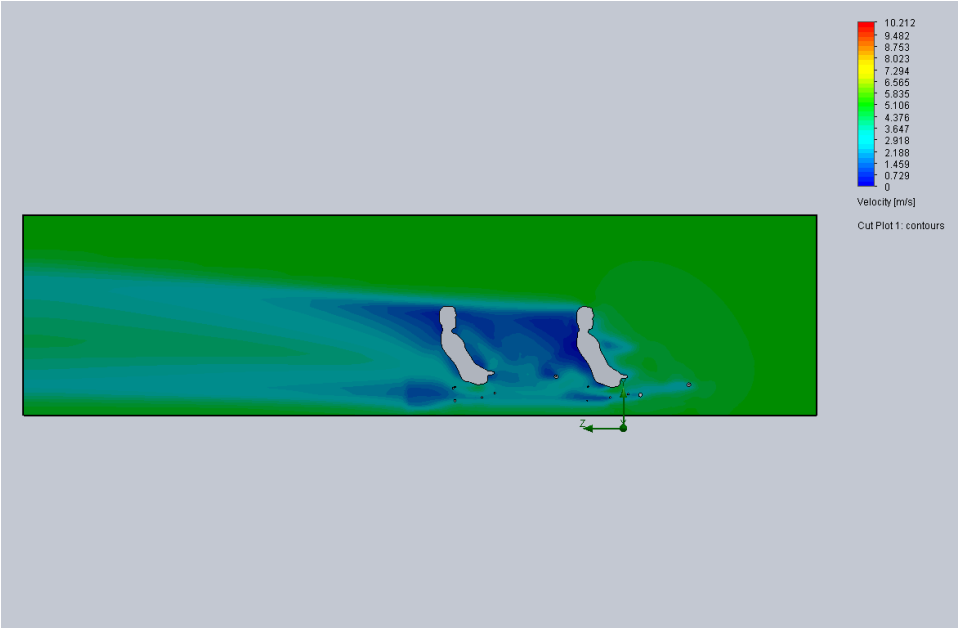


Figure 8: $v = 5m/s$, global initial mesh = 5

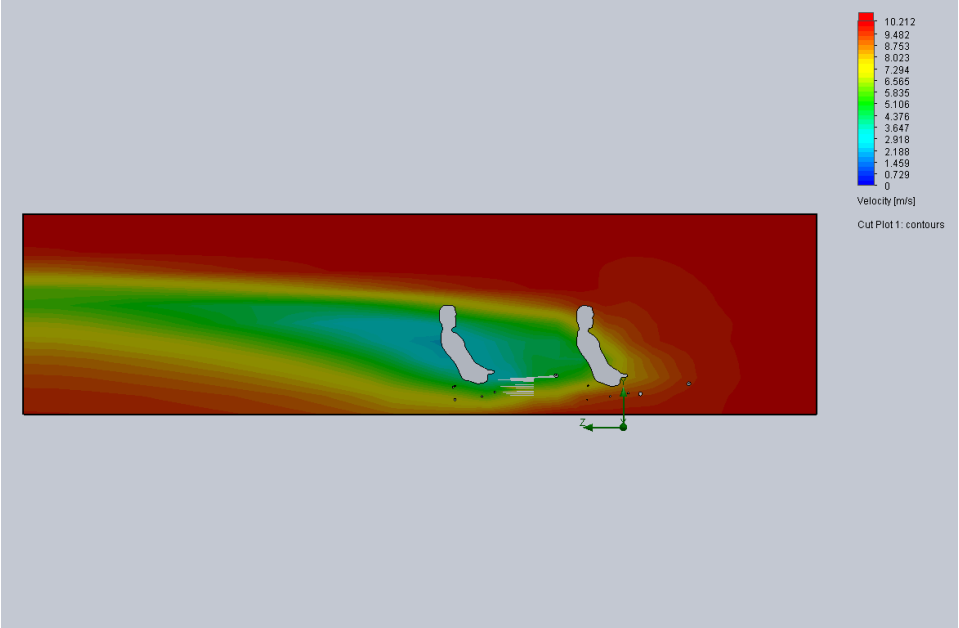


Figure 9: $v = 10m/s$, global initial mesh = 2

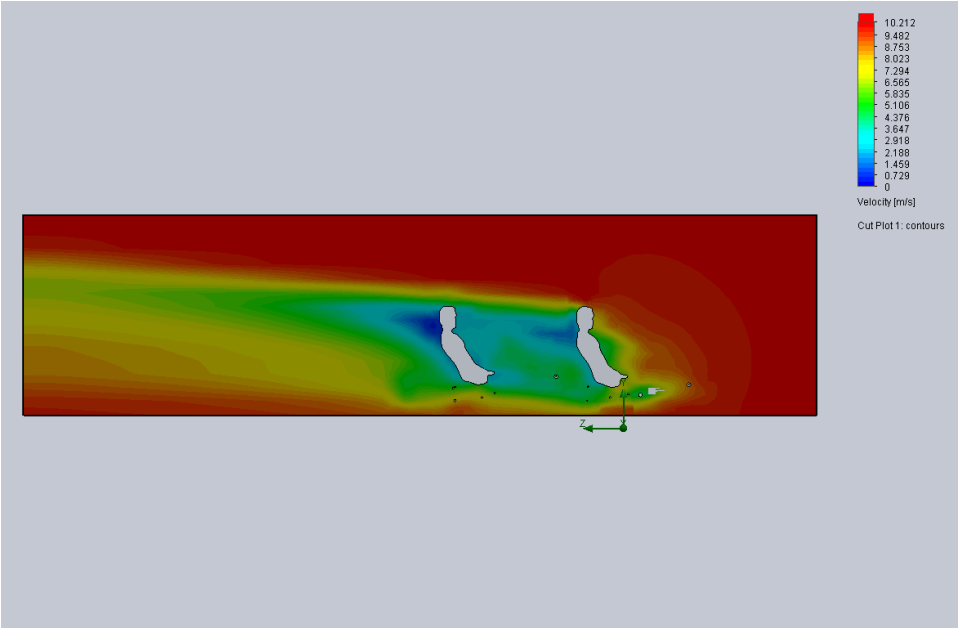


Figure 10: $v = 10m/s$, global initial mesh = 3

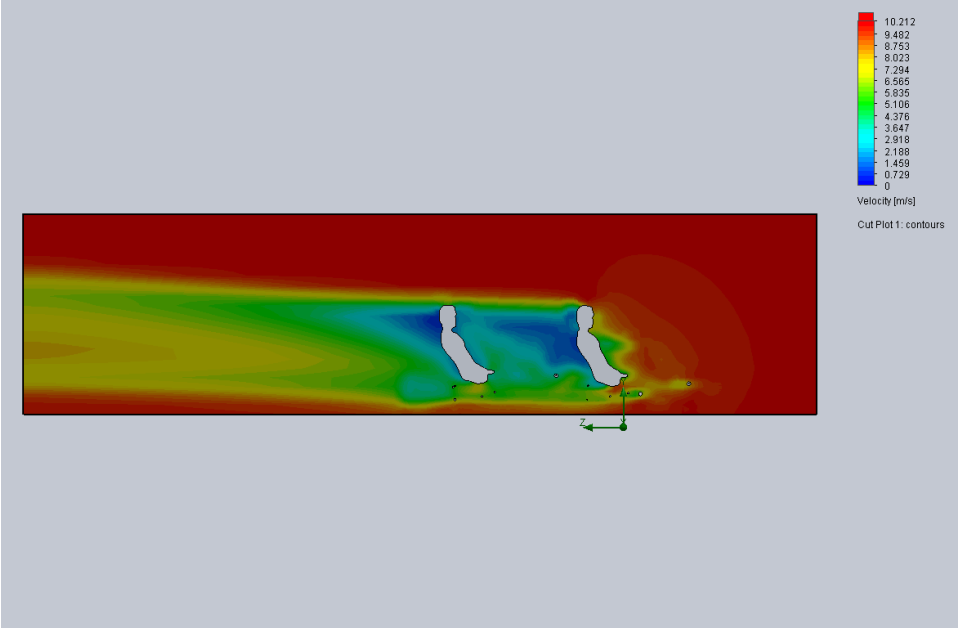


Figure 11: $v = 10m/s$, global initial mesh = 4

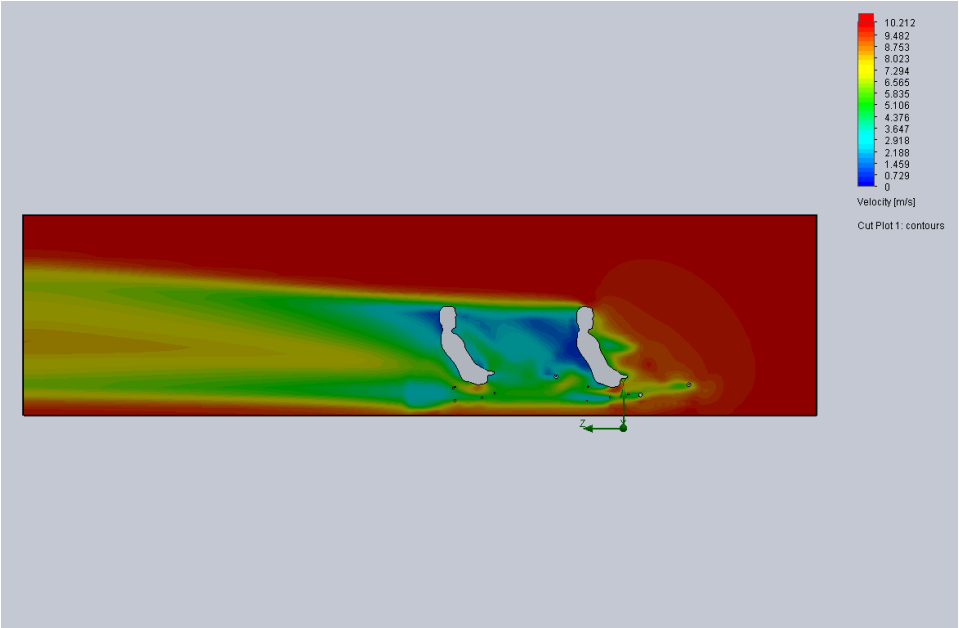


Figure 12: $v = 10m/s$, global initial mesh = 5

1 roof tests

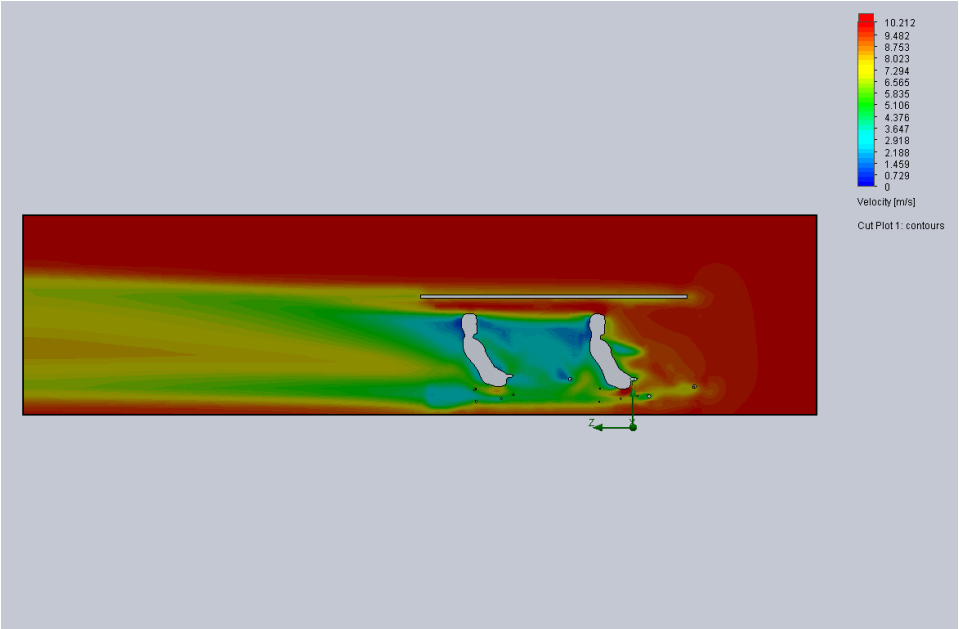


Figure 13: $v = 10m/s$, global initial mesh = 5. Note that with the roof the drag increases from 15N to 17N.

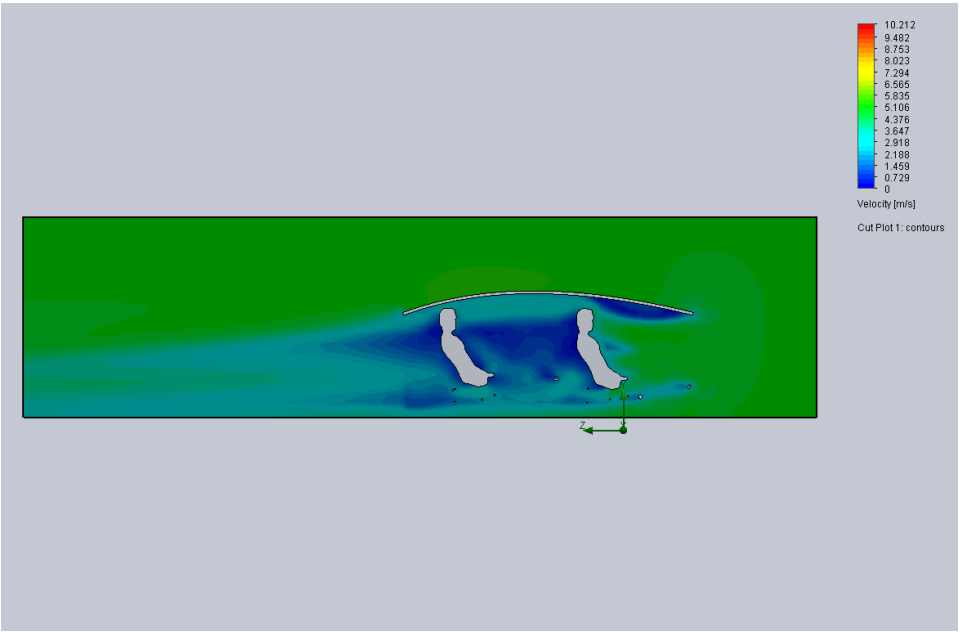


Figure 14: $v = 5m/s$, global initial mesh = 5. Note that with the roof the drag increases from 4N to 5N but turbulent tail is significantly suppressed.

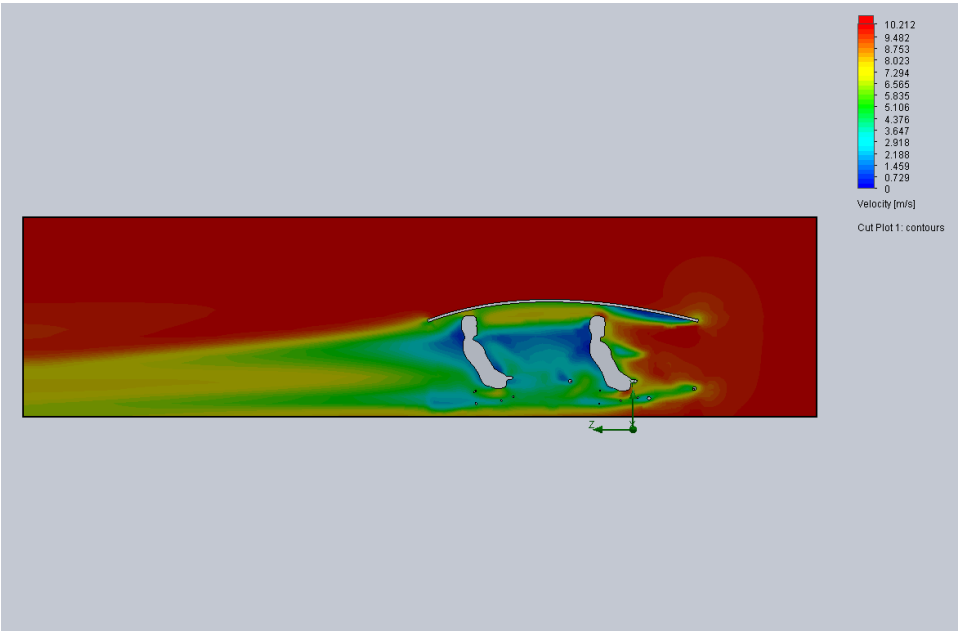


Figure 15: $v = 10m/s$, global initial mesh = 5. Note that with the roof the drag increases from 15N to 19N but turbulent tail is significantly suppressed.

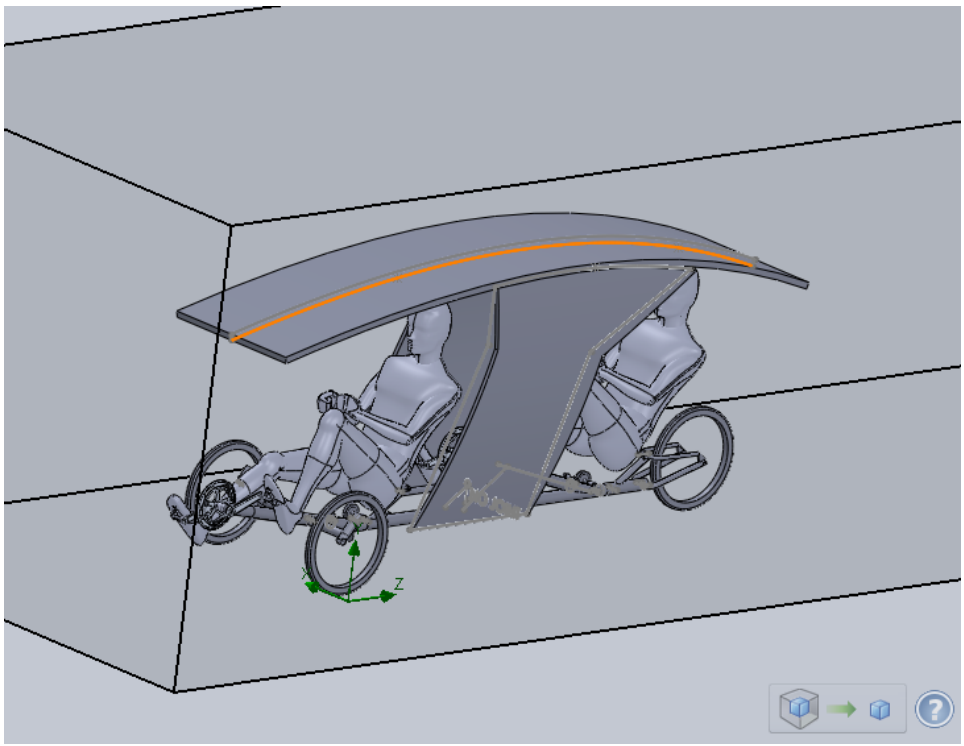


Figure 16: roof and sidefender

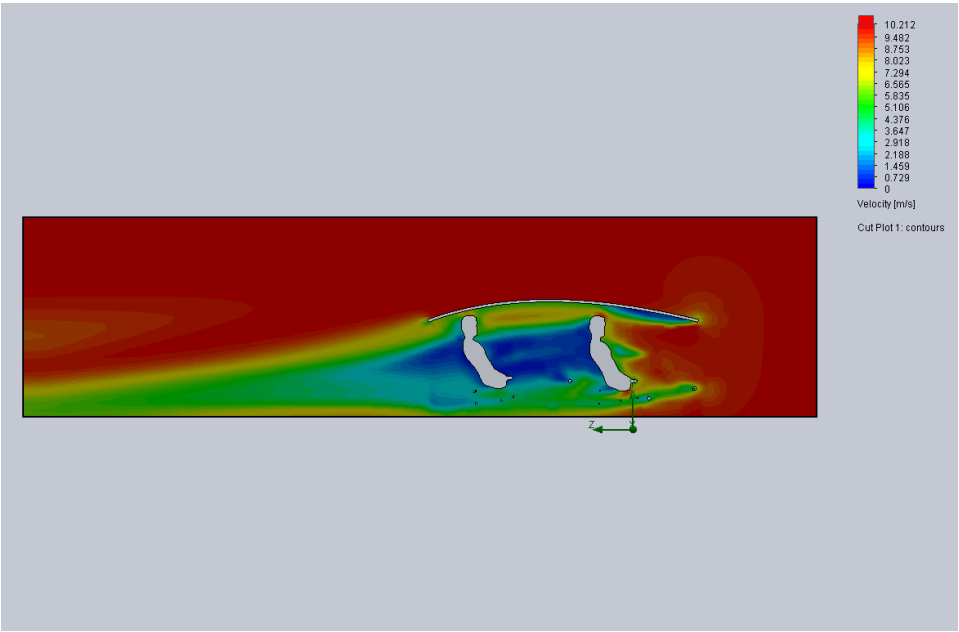


Figure 17: $v = 10m/s$, global initial mesh = 5. Adding sidefenders reduces drag force from 19N to 18.5N

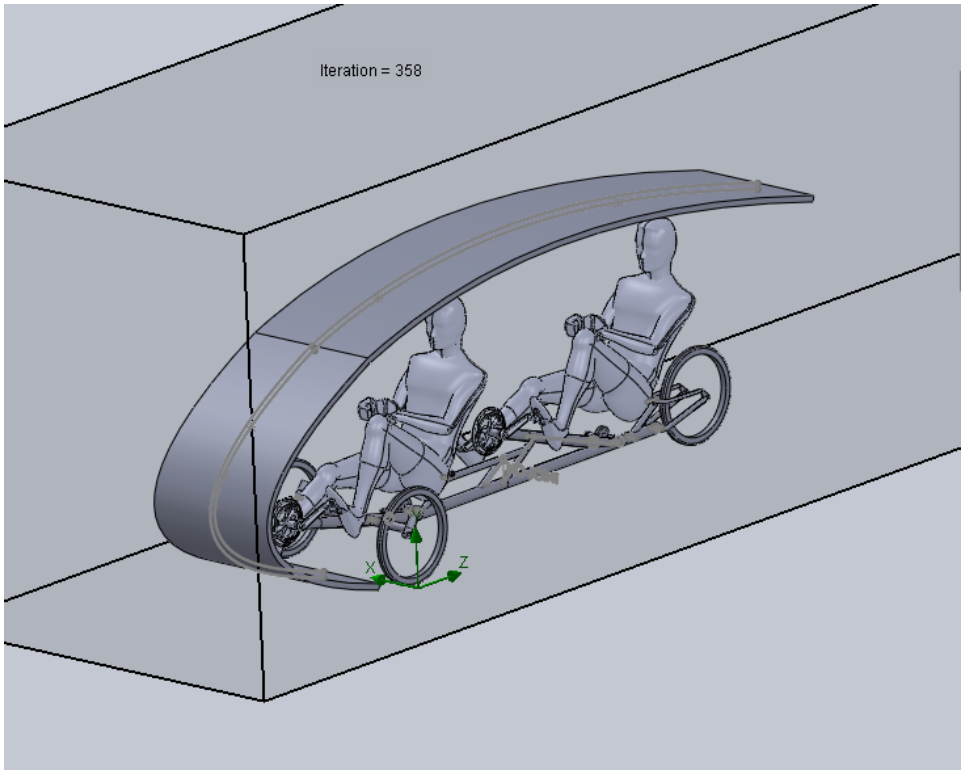


Figure 18: roof and sidefender

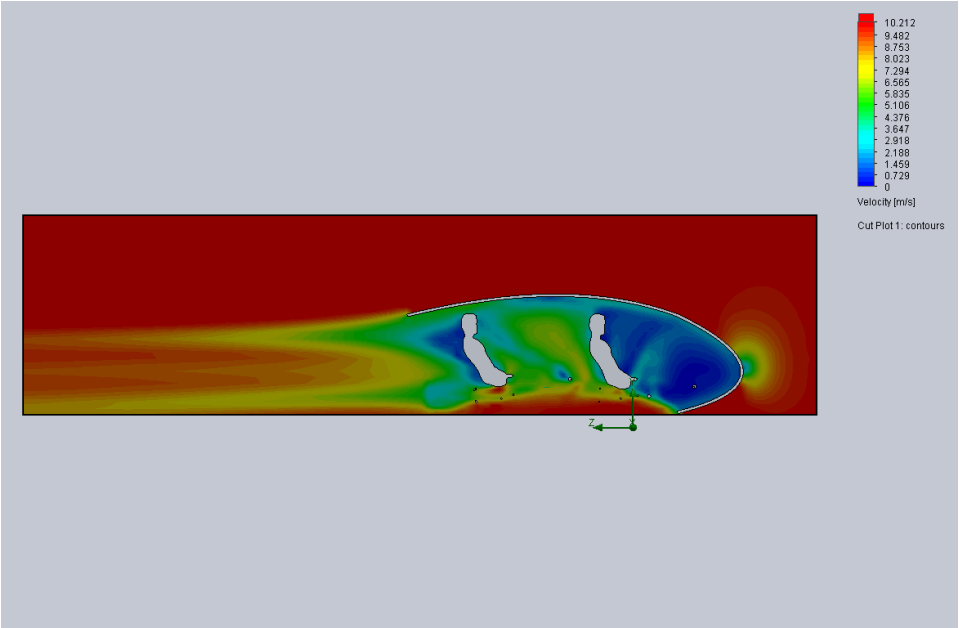


Figure 19: $v = 10m/s$, global initial mesh = 5. Drag force is 34N

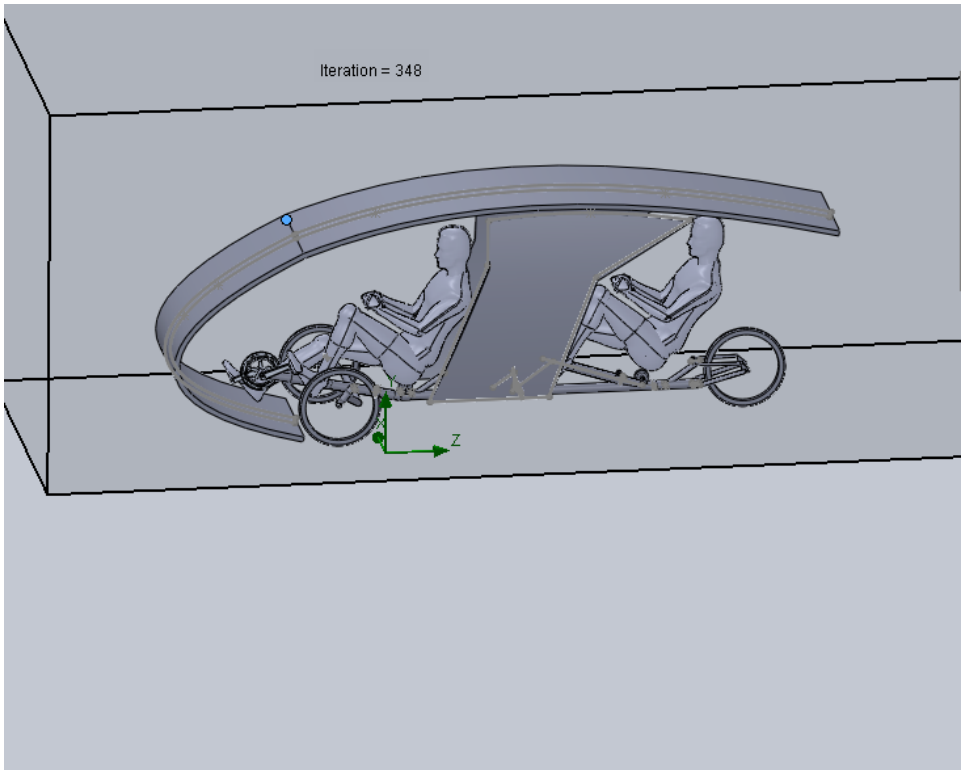


Figure 20: roof and sidefender

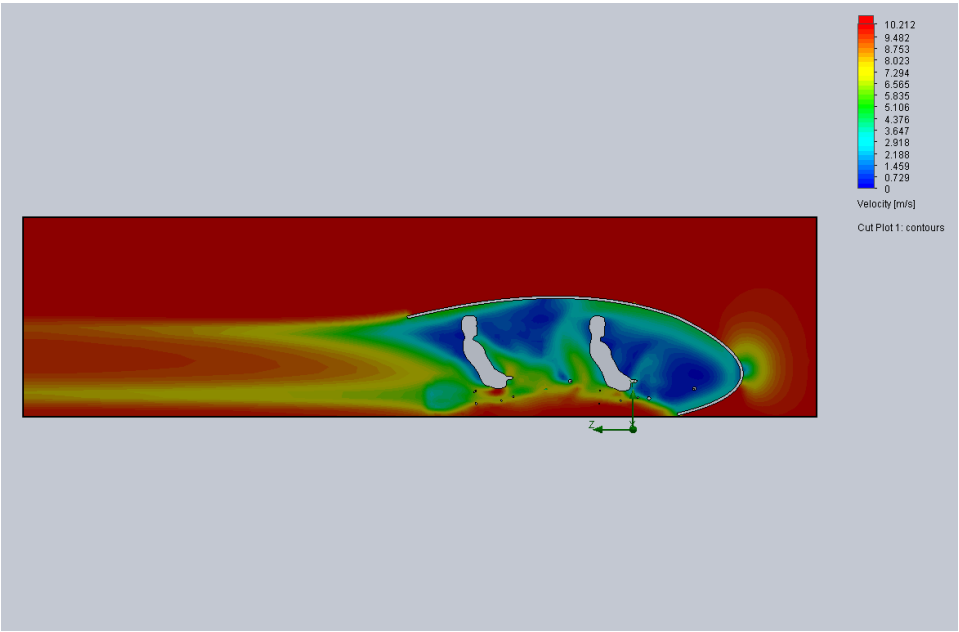


Figure 21: $v = 10m/s$, global initial mesh = 5. Adding sidefenders reduces drag from 34N to 30N.