

For this project, our group was set the task to design a 3D helmet of our choice that would compliment all safety and efficiency standards. We chose to model a professional cycling helmet due to its aerodynamics, weight, and safety when used.

The goal of professional cycling helmets is to reduce the **drag** of the wind on the cyclist while he or she is riding. The sleek design of the helmet allows both the **coefficient friction** and **inertia** on the cyclist to be minimal as well. In regards to the helmet, the cyclist needs to reduce its weight as much as possible to increase his **acceleration** throughout the ride. This is done through the use of lightweight but extremely durable materials such as carbon fiber.

Our helmet hopes to encompass all factors that go into the construction of a time trial helmet to the highest degree. The first factor that we need to take into account is the materials used. Our helmet will be built using carbon fiber to reduce the impact on the cyclist's head if he was to fall. This concept is called the **crumple zone**; by using carbon fiber and a light foam on the inside the materials will be able to withstand the majority of the impact so the cyclist reduces his chances to get hurt. As well since the helmet is elongated towards the back it restricts the chances of the rider breaking his neck and severing his jugular veins from a face-first fall. This unusual design also decreases the **friction** between the cyclist head and the airflow while riding which in turn increases speed significantly.

The next factor that our helmet compliments are that it increases **acceleration** for the rider which in turn increases the **G Force**. While riding, cyclists use **force** through their feet pushing the pedals constantly to propel the bike forward. Finally, the **kinetic friction** between the wheels of the bike and the ground is decreased due to the thinness of the wheels. All these factors in combination with our 3D helmet we designed would allow a cyclist to have the highest potential of a top speed while riding.

<https://www.evanscycles.com/coffeestop/advice/helmets-for-different-cycling-disciplines-explained>

<https://www.bikeradar.com/us/gear/article/best-aero-time-trial-helmets-34859/>



