1. *Force distribution*
   1. Wheel base

The frame must be able to support the weight of the rider, outer shell, and interior components. With all the weight on the frame the wheel placement plays an important role. The ideal *wheel base* is 100 cm (1 metre). This distance is chosen to ensure maximum comfort, handling, and safety. A wheel base that is to long will result in the bike to have reduced handling. It will also cause the bike to have a greater *turning radius*. The long wheel base will have the biggest impact on the sturdiness of the bike, the longer the wheel base the easier it is for the bike to tip over or become or roll. On the positive side a long wheel base provides a more comfortable and smooth ride since the rider is further away from the wheels. A short wheel base has the opposite effect of a long wheel base. The short wheel base leads to a sturdier bike with better handling, and a smaller turning radius. The rider is almost on top of the front wheels with a short wheel base resulting in a bumpier and uncomfortable ride. Also, since the rider is almost on top of the front wheels, the rear wheel will not have enough weight on it. Not enough weight on the rear tire will cause the tire to not gain enough *traction* and spin out, or the rider could flip forward when applying the brakes.

* 1. **Seat placement**

Where the seat is placed is also a big factor in force distribution as the rider may be very heavy and is directly on top of the frame. The best seat placement is the ratio of 70/30 measured front tires to back tire. That is 70 % of the distance towards the front tires if measuring the wheel base starting at the back tire. Since the number can vary slightly the chair will be able to slide forward and backwards to tailor to the riders comfort.

1. **Centre of Mass**

The *centre of mass* plays a very important role in how sturdy the bike is. If the centre of mass is low enough the bike is very unlikely the bike will tip, regardless of wheel and seat placement. A centre of mass that is too low can result in a decrease in visibility and safety. Therefore, a centre of mass slightly lower than the centre of the wheels is desired, to maintain visibility and stability. This can be achieved by putting a bend or curve in the frame inside the wheel base.

1. **Conclusion**

The ideal frame for the bike is one that is sturdy, safe, has good visibility and handling. The wheel base length is 1 metre long. The seat will be placed 30 cm measured from the rear tire towards the front. The centre of mass will be slightly lower than the centre of the wheels. With these three lengths and placements the bike will be the safest and most comfortable it can be.