Cycling Power

$$\Sigma F_{ON} = ma_{com} \quad \left| \text{Horizontal} \right|$$

$$F_{PROPULSION} - F_{RR} - F_{SLOPE} - F_{DRAG} = ma_{com}$$

1. $\text{Power} = \frac{W}{\Delta t}$

$W = Fd$

$\text{Power} = \frac{Fd}{\Delta t} = F\left(\frac{d}{\Delta t}\right)$ ($\frac{d}{\Delta t} = v$)

2. $\text{Power} = Fv$

units: Watts

W

$$F_{Propulsion} - F_{RR} - F_{Slope} - F_{DRAG} = ma_{com}$$

$$F_{Propulsion} = ma_{com} + F_{RR} + F_{Slope} + F_{DRAG}$$

[Multiply both sides of equation by velocity of bike + Rider]

$$(v)\left(F_{Propulsion}\right) = \left(ma_{com} + F_{RR} + F_{Slope} + F_{DRAG}\right)v$$

$$Power = \left(ma_{com} + F_{RR} + F_{Slope} + F_{DRAG}\right)v$$

[This is the cyclist]

Eg. Cycling at constant velocity

$a = 0\ m/s^2$

$$Power = (F_{RR} + F_{SLOPE} + F_{DRAG})v$$

$$v = \frac{Power}{F_{RR} + F_{SLOPE} + F_{DRAG}}$$

How to go Faster?

1. Decrease Resistance Forces.
2. Increase (train) Power.