Cycling Speed

Cycling speed is the speed at which the cyclist would be travelling if they were not fixed to the training platform. It can be calculated by measuring the wheel rotational speed and wheel diameter using equation 2.2, where D is the diameter of the wheel.

$$v = \omega \times \frac{D}{2} \tag{2.2}$$

Zwift uses the speed measurement of the cyclist to control the speed of the avatar in the virtual environment. This is thus the most basic type of data that is required to interact with the application. If a supported "dumb" or turbo trainer is used, then Zwift can determine the braking force that is applied given curtain conditions such as brake lever position and riding speed. The minimum requirement for full utilization of the platform is a speed sensor when using a supported wheel-on trainer.

Cycling Cadence

Cadence is the rotation rate of the pedals of the bike and is usually measured in Revolutions Per Minute (rpm). Zwift does not require any cadence data for interacting with the platform, as it does not take the cadence into account for controlling the virtual avatar. Cadence data is often used by cyclists as a gauge of how hard the given exercise is. A higher cadence means that the cyclists is cycling faster and experiencing a more intense workout, where a slower cadence might mean that there is more load on the cyclists legs, but at a lower intensity.

2.2   BLE vs ANT+

BLE and ANT+ are wireless communication technologies that are both widely used in consumer products across many industries. Both BLE and ANT+ devices communicate over Ultra-High Frequency (UHF) electromagnetic waves with frequencies around 2.4 GHz. This communication takes place over small distances and requires both transmitting and receiving device to have supporting hardware in order to communicate.