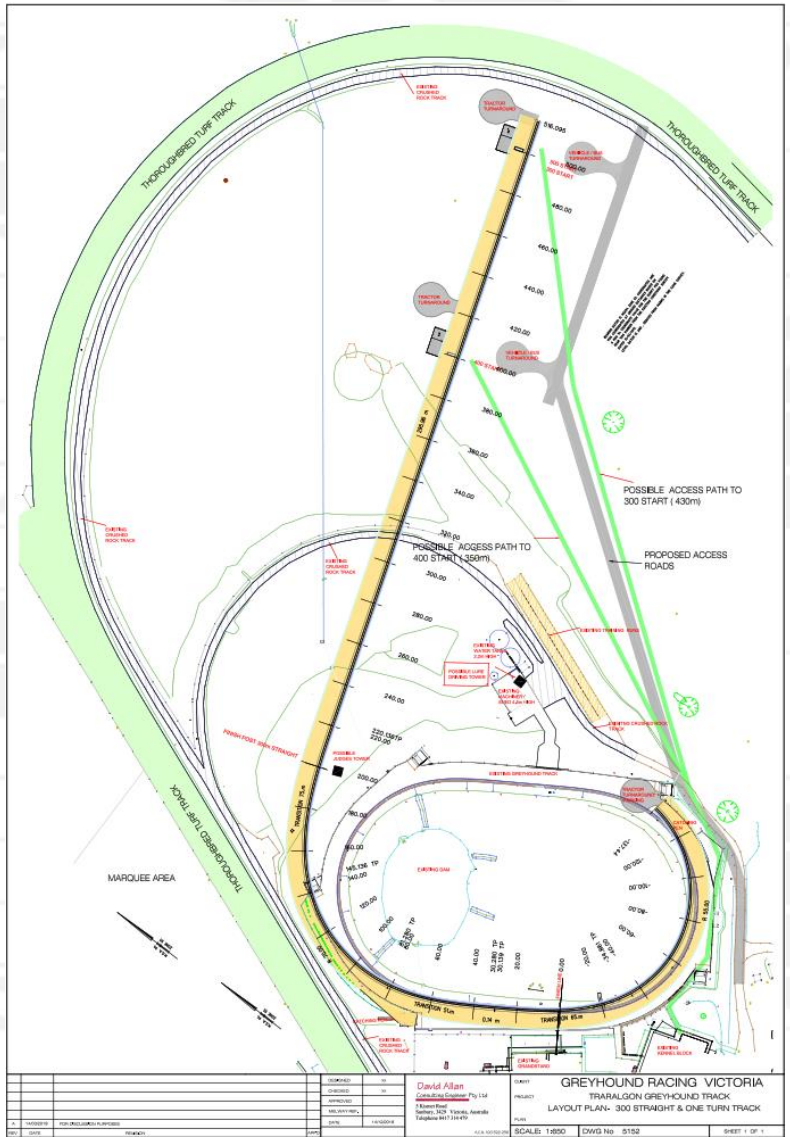
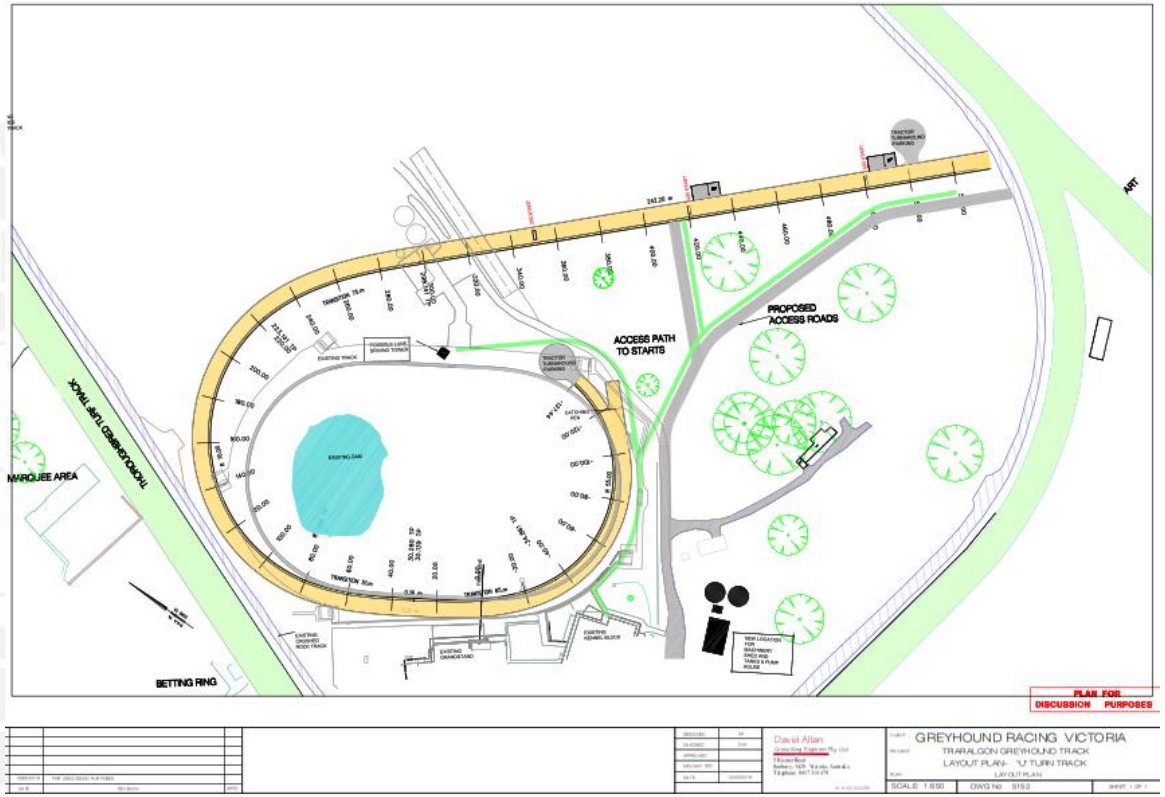
TRARALGON TRACK REDESIGN
Prepared for Consultation

18 June 2019

GREYHOUND RACING VICTORIA

Traralgon Track Redesign:-
Current Proposed Designs



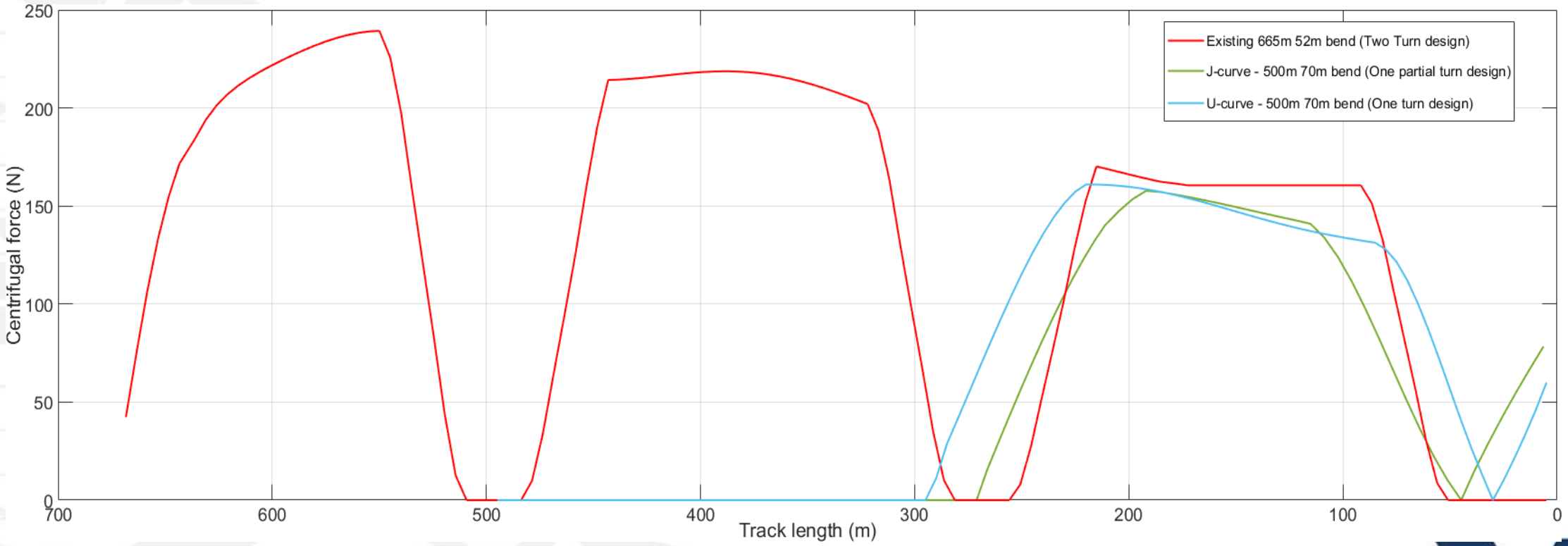


Traralgon Track Redesign:-

- Designed with **RACING SAFETY** as the priority
  - 75 metres transition turn
  - 70m radius
  - Reduced forces and pressure on racing greyhounds
  - Low levels of SNAP and JERK
- Utilising existing infrastructure:
  - Kennel Block
  - Grandstand
  - Home Straight
  - Timing Systems
  - Build to fit within limitations of site including thoroughbred track.

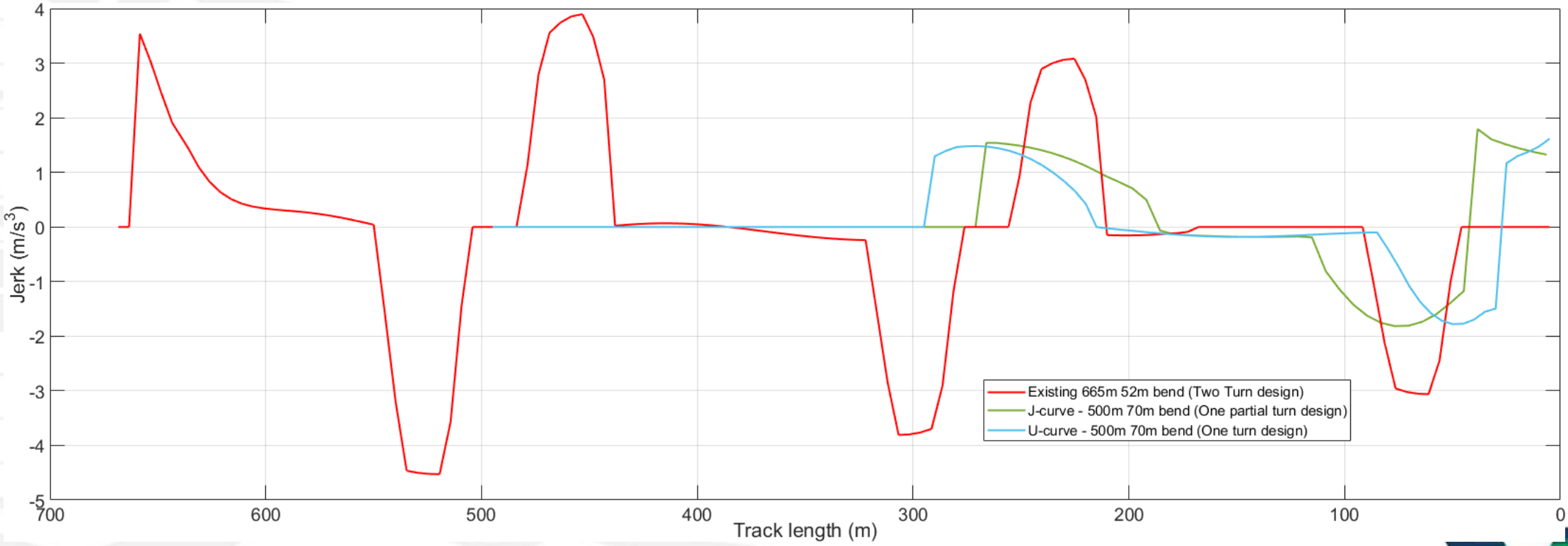
Centrifugal force comparison

For the proposed U-shaped track, the greyhounds are subjected to centrifugal force for slightly extended period compared to J-shaped track where the peak centrifugal force is gradually stable for the entire race period. *UTS Report June 2019



Jerk comparison

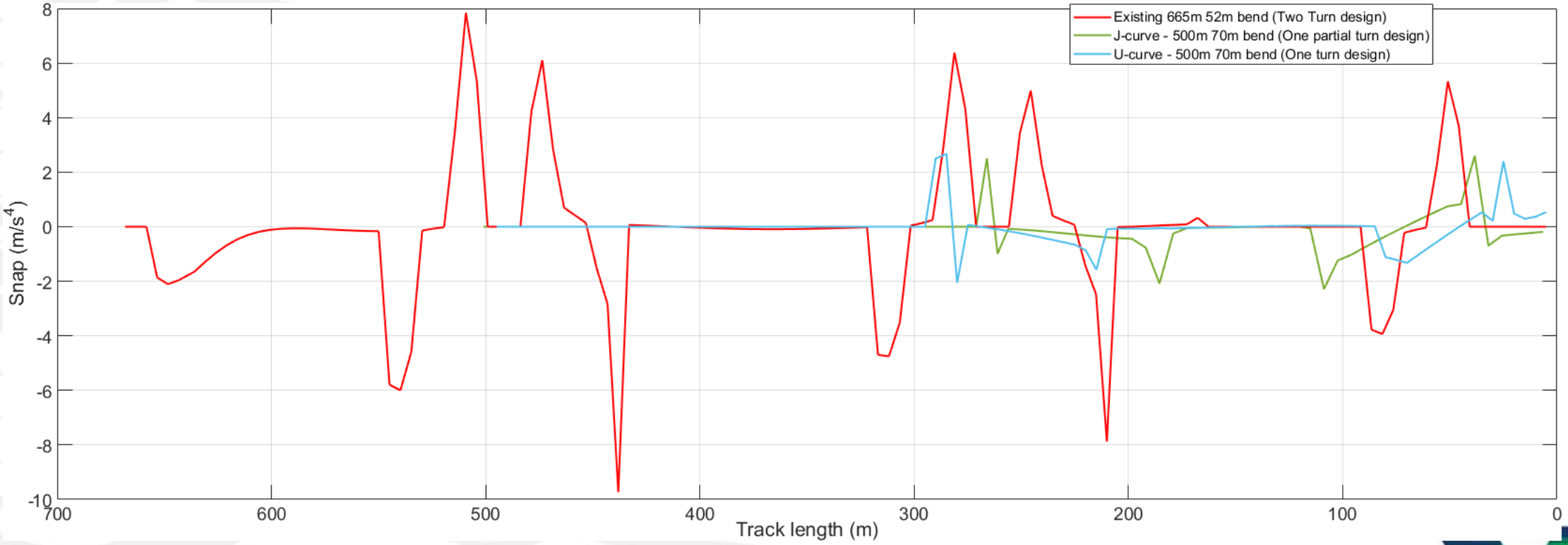
Compared to existing track both J-shaped and U-shaped tracks designs have significantly lower centrifugal acceleration jerk. Furthermore, the jerk in both J-shaped and U-shaped tracks designs are gradually stable for the entire race period. *UTS Report, April 2019



Snap comparison

Compared to existing track both J-shaped and U-shaped tracks designs have significantly lower centrifugal acceleration snap. Furthermore, the snap in both J-shaped and U-shaped tracks designs are gradually stable for the entire race period.

UTS Report, April 2019



Glossary

- **Velocity** is the rate of change of displacement. It is a vector and is measured in m/s. Greyhounds experience velocity when they move and acceleration when they change the velocity at which they move. Their body does not feel velocity, but only the change of velocity i.e. acceleration, brought about by the force exerted by an object on their body.
- **Centrifugal force** is the *apparent* inertial force that is felt by the greyhound galloping around a bend or curved track. It acts outwardly away from the centre of rotation and is the reason why they lean into the rail as they traverse the bend. It is a vector and is measured in Newtons (N). Because it is a force the magnitude is proportional to the mass of the greyhound. This is why the lighter female greyhound can handle a tight 2-turn tracks better than a heavier male greyhound. When a bend is banked the elevation of the bank reduces the reactionary force and tends to stabilise the greyhound. Should the greyhound loss traction the equilibrium of forces between the greyhound and the track surface will be broken and the greyhound will loss stability and control of its circular direction and move tangentially. This can result in the greyhound disrupting the orderly flow of others greyhounds or in certain situations in this greyhound impacting the outer fence of the track.
- **Jerk** is the rate of change of acceleration. It is a vector and is measured in m/s^3. It is commonly associated with a short sudden movement such as yanking or snatching an object. It is important when evaluating the destructive effect of motion or at lower magnitudes discomfort caused to passenger in a vehicle or lift. In greyhound track design it is associated with a sudden change in the track shape that causes the greyhound to change its trajectory from a smooth to a least then smooth path. This behaviour is particularly problematic if it is combined with other destabilising dynamisms such as centrifugal force.
- **Snap** is rate of change of jerk. It is a vector and is measured in m/s^4. It is a good indicator that the change in acceleration is excessive. In a simple way that velocity is the first derivative of displacement, acceleration is the second derivative of displacement, jerk is the third derivative of displacement, snap is the fourth derivative of displacement. Displacement, velocity, acceleration, jerk and snap are different and give a greater insight into that understanding of the effect of changes in motion.
- For more information on velocity, acceleration, jerk and snap visit European Journal of Physics article: https://iopscience.iop.org/article/10.1088/0143-0807/37/6/065008/pdf

Scott Robins, Director, Safe Racing and Sustainable Breeding.
srobins@grv.org.au
(03) 8329 1123