Mandurah greyhound track upgrade
Report 6 – Review of track Design 5

By Prof David Eager and Imam Hossain

For Racing and Wagering Western Australia

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Executive summary

This is the sixth report in a series of reports prepared by UTS for Racing and Wagering Western Australia.

The purpose of this Report was to review an additional proposed Design 5 for the Mandurah greyhound track (70 m bends, 50 m transitions, 6.0 m wide) and compare this with Design 3 (70.9 m bends, 59.8 m transitions, 7.0 m wide)[1].

This report should be read in conjunction with Reports 4 and 5.

The start of centrifugal acceleration for the proposed Design 5 for the 647.0 m distance race is slightly higher but nevertheless smoother than 700.0 m distance race from Design 1 for the first bend.

When compared with the existing Mandurah greyhound track, Design 5 will reduce the average long-term frequency and severity of injuries at the Mandurah greyhound track.

[1]Design 3 is the safest proposed Mandurah greyhound track upgrade that UTS has evaluated.

Contents

1 Introduction

1.1 General

This is the sixth report in a series of reports prepared by UTS for Racing and Wagering Western Australia (RWWA).

This report is a supplementary report to Reports 4 and 5. All three reports should be read in conjunction.

As stated previously, the Mandurah greyhound track is located at Kanyana Park, approximately 65 km south of Perth in close proximity to the majority of greyhound trainers. The existing track has four starts, namely: 302 m, 405 m, 490 m and 647 m.

1.2 Design constraints

The design constraints are the same as those stated in Report 4.

2 Design 5: 70.9 m bends, 59.8 m transitions, 6 m wide

2.1 Design 5: Track shape

The Design 5 proposal resembles proposed Design 1 with two 70 m semicircular bends joined to two 21.7 m straights by four 50 m transitions. The Design 5 track has four starts, namely: 302 m, 400 m, 487 m and 647 m, where only the longest distance race start (647 m) is different from proposed Design 1. Hence, only the longest race distance start (647 m) was analysed in this report.

2.2 Design 5: Curvature for each starting distance

Figure 1 shows a plan view of the Design 5 with fundamental track dimensions and the curvature lines which is identical to Design 1 except 700 m (greyed) distance start which was deleted and replaced with the existing 647 m distance start.

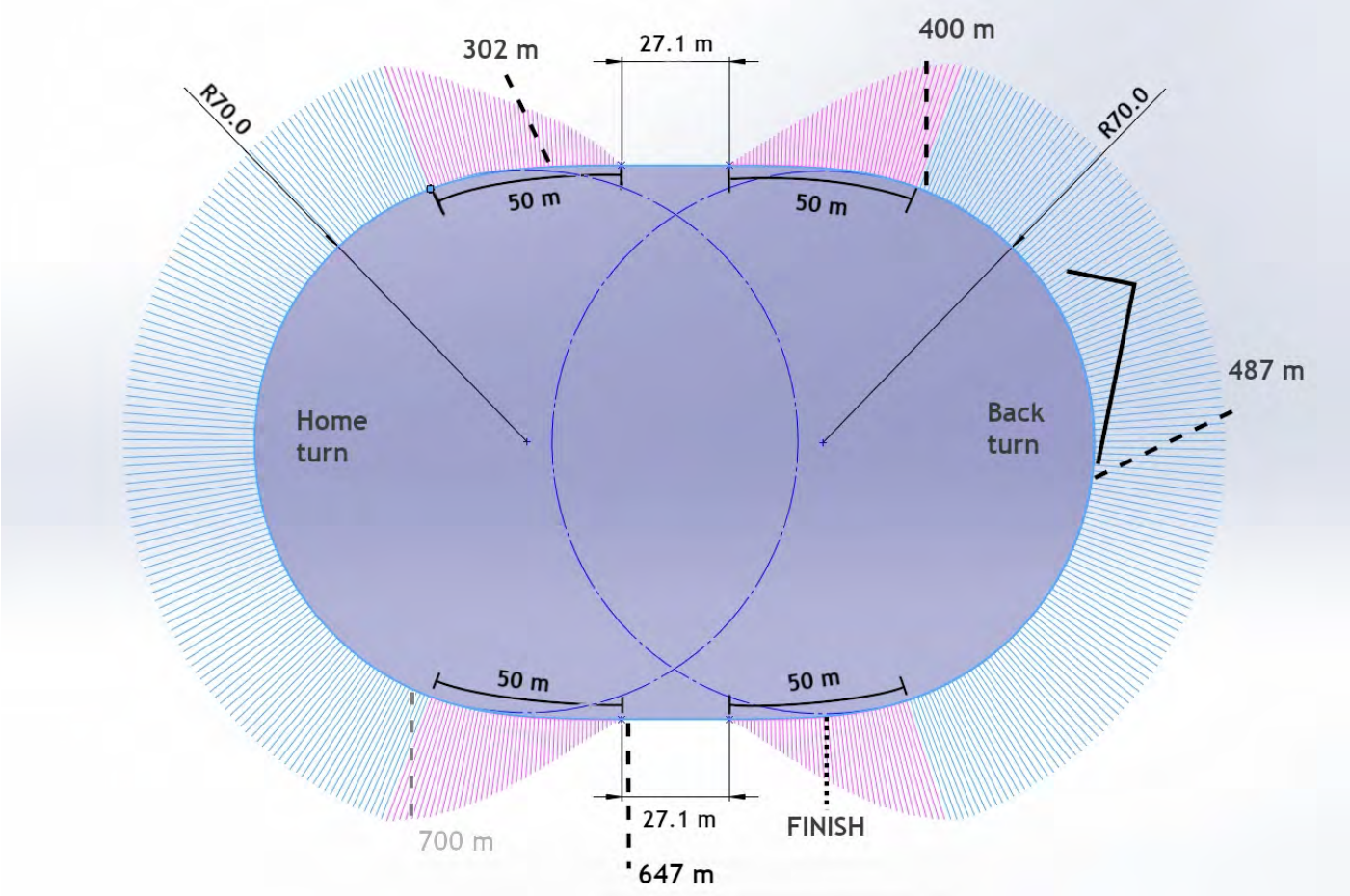

Figure 1: Design 5 Mandurah greyhound track curvature line plot (70.0 m bends, 50.0 m transitions). The lengths of the perpendicular blue lines are inversely proportional to the magnitude of the radius of curvature calculated 1 m perpendicular from the inner rail.
Source: David Allan Consulting Engineer Pty Ltd.

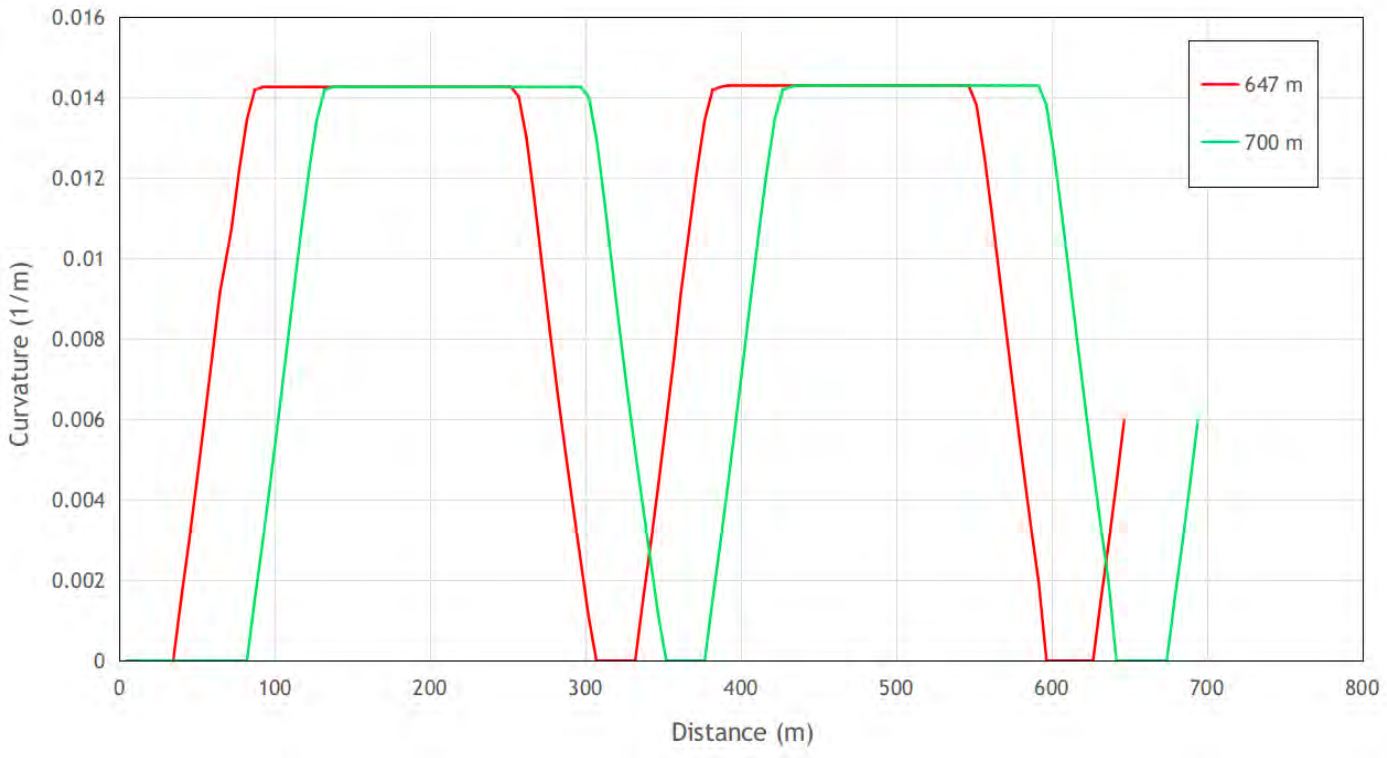

Figure 2: The curvature plots for 647 m (Design 5) and 700 m (Design 1) starting distances for Mandurah greyhound track. The plots commence at the respective Starting Boxes and end at the Finish Post.

2.3 Design 5: Centrifugal acceleration for each starting distance

The magnitude of centrifugal acceleration for 647 m (Design 5) and 700 m (Design 1) starting distances versus track distance measured from the respective starting boxes for the proposed Mandurah greyhound track is given in Figure 3.

The maximum acceleration for the proposed Design 5 for the 647 m distance race is marginally higher than 700 m distance race from Design 1. Also, the start of centrifugal acceleration for the proposed Design 5 for the 647 m distance race is slightly smoother than 700 m distance race from Design 1 for the first bend.

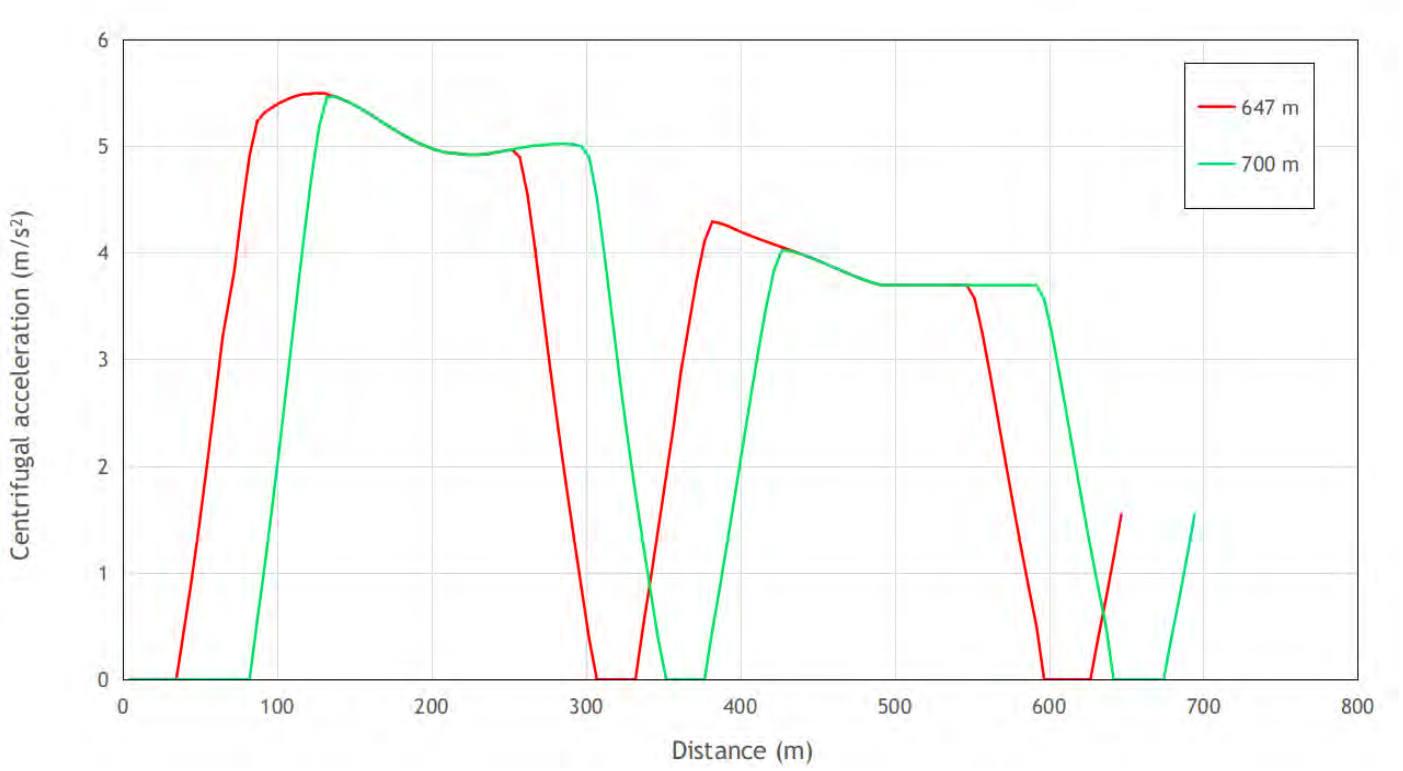

Figure 3: The centrifugal acceleration plots for 647 m (Design 5) and 700 m (Design 1) starting distances for Mandurah greyhound track. The plots commence at the respective Starting Boxes and end at the Finish Post.

2.4 Design 5: Jerk for each starting distance

The jerk for 647 m (Design 5) and 700 m (Design 1) starting distances versus track distance measured from the respective starting boxes for the proposed Mandurah track is given in Figure 4. The jerk for the proposed Design 5 for the 647 m distance race is slightly safer than 700 m distance from Design 1.

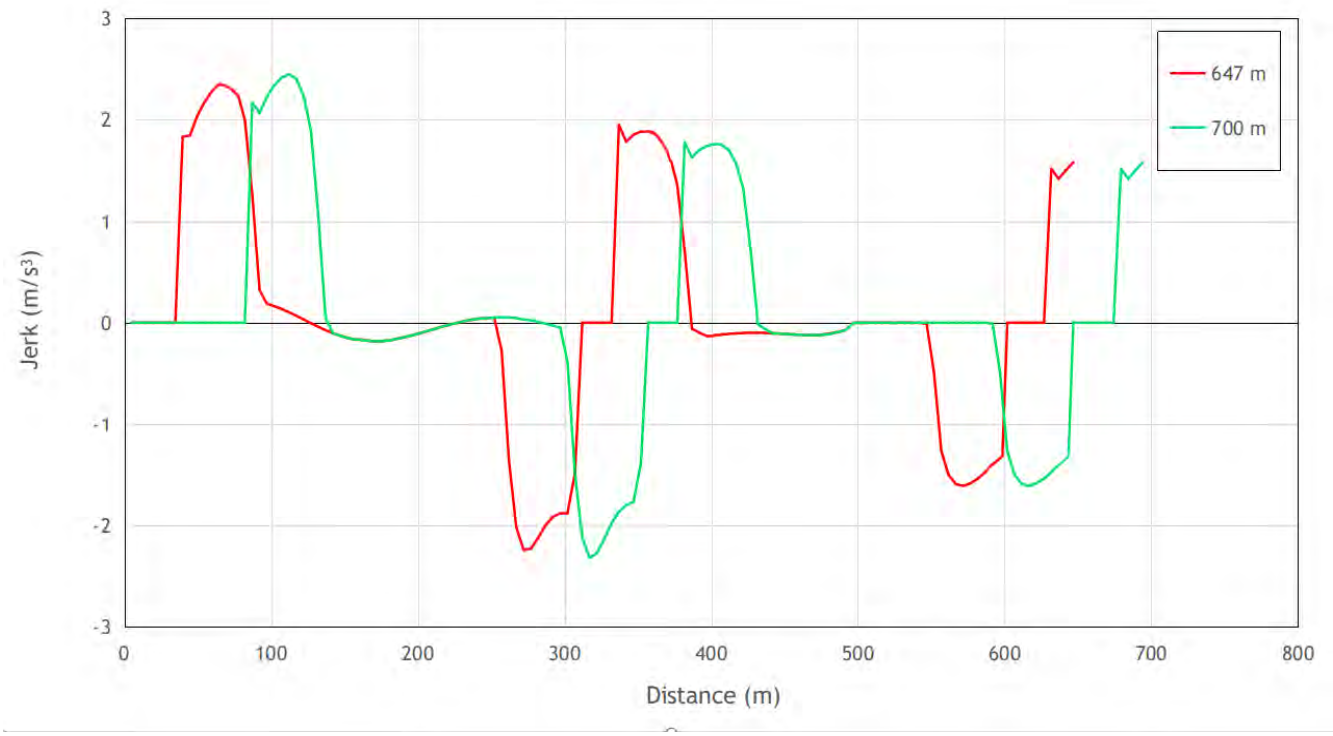

Figure 4: The jerk plots for 647 m (Design 5) and 700 m (Design 1) starting distances for Mandurah greyhound track. The plots commence at the respective Starting Boxes and end at the Finish Post.

2.5 Design 5: Starting box simulations

For proposed Design 5 it is expected that greyhound turning tendency would be similar to corresponding starting distances found in Design 1 for the 302 m, 400 m and 487 m and existing track for the 647 m starting box locations and alignments.

2.6 Design 5: Track width

The Design 5 track width of 6.0 m is required minimum track width as found in many tracks nationwide. This width of a track showed to bring safety to greyhound run at some greyhound tracks such as Horsham greyhound track, Victoria.

3 Comparison of Designs 1, 2, 3, 4 and 5

UTS has conducted reviews of the following David Allan Consulting Engineer Pty Ltd designs:

- Design 1: 70 m bends, 50 m transitions, 7 m wide;
- Design 2: 69 m bends, 60 m transitions, 7 m wide;
- Design 3: 70.9 m bends, 59.8 m transitions, 7.0 m wide;
- Design 4: Design 3 with the addition of a set of drop-on boxes on the Back Straight; and
- Design 5: 70 m bends, 50 m transitions, 6.0 m wide.

The proposed Design 5 has similar advantages as Design 1, but with the disadvantage that it is narrower and would be slightly more congested.

The proposed Design 5 falls short of the preferred Design 3 for greyhound race dynamical safety.