BICESTER
MOTION

# Experience Quarter
# Driving Tracks – Design Strategy Report

Prepared by:  Driven International Ltd
Document: 9203  Revision: B
Author: B. Willshire / Reviewed by: R. Darghouth

Issue Date: 26th November 2020

Driven.

THE QUEEN'S AWARDS FOR ENTERPRISE: INTERNATIONAL TRADE 2020

# CONTENTS

BICESTER
MOTION

# DISCLAIMER

BICESTER MOTION

This document has been prepared pursuant to and subject to the terms of the appointment of Driven International Ltd ("Driven") by Bicester Motion (the "Client"). Driven accepts no liability for any use of this document other than by its original client or following Driven's express agreement to such use, and only for the purposes for which it was prepared and provided. Where the conclusions and recommendations contained herein are determined based on information provided by third-parties, these are provided on the basis that all such requested information has been provided and is accurate.

Driving in excess of normal highway speeds is dangerous. The risks posed to drivers, passengers, staff, public and any other persons affected by the operation of this facility is influenced by many different factors including but not limited to weather, visibility, time of day, condition of the driving surface and vehicles, number and competence of the users and staff of the facility, operations and maintenance procedures, to name but a few.

In addition, careful co-ordination and planning will be required by the venue owner to co-ordinate with the aerodrome, resulting in an operational plan that manages use of the track safety zones in accordance with planned aviation movements.

Any designs, specifications, simulation data, or any other advice, either implied or expressly provided, will not eliminate all these risks. Driven International Ltd use simulation tools, which are based on real world industry data to apply internationally recognised guidelines and industry best practice to minimise the risks as far as reasonably practicable in the design of the course. Any design, video, sketch, simulation or advice that shows or implies a vehicle will come to a stop before impacting a barrier or other hazard situation does not imply or suggest that an impact is not possible. Such calculations, simulations and presentations thereof are simply a measurement of risk which has applied published guidance by the international governing (the Federation Internationale de l'Automobile or FIA) and under no circumstances implies that the design eliminates risk to persons or property.

# 1. INTRODUCTION

The purpose of this document is to provide a description and overview to the driving facilities that could be developed as part of Bicester Motion.

This report should be read in conjunction with the wider consultant team reports, and in particular the aviation assessment and track noise assessment.

Bicester Motion is the proposed expansion of the successful Bicester Heritage development, located at the former MOD RAF Bicester site in the UK.

The proposed track developments are aimed at securing the future of the site as a key asset for the UK, offering training & development programs for road safety, automotive testing and demonstration.

To date, an existing short test track loop is operational, making use of the former RAF airfield perimeter track. The existing track is a temporary circuit, and the site requires suitable permanent facilities to attract leading automotive and technology enterprises to Bicester Motion.

**Fig1: The proposed site for Bicester Motion driving tracks**

Proposals for the Bicester Motion site include driving tracks that;

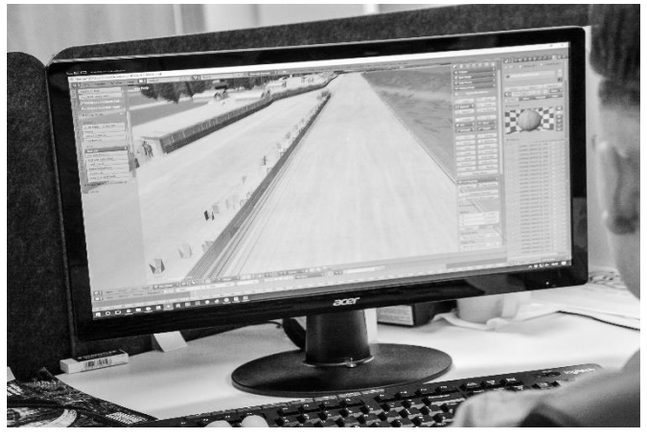
- Designed to support continued aviation activity.
- Sensitively designed to fit the character of the site.
- Appropriate use in consideration of location.
- Are designed for vehicle demonstration, testing, research and development
- Offer a controlled and purpose built environment for driver education and experiences
- Are suitably presented and offer amenities for hosting automotive product launches

# 2. THE DESIGNERS

Bicester Motion have engaged an award winning design firm, Driven International Ltd, as track design specialists to work alongside their wider design and consultant team during the planning and development process.

Driven International are a UK RIBA chartered design firm, focusing on the design of automotive and driving venues. Their team work globally on automotive destination projects, and are only one of twelve design firms who are recognised by the world governing body for motorsport and road safety, the FIA (Fédération Internationale de l'Automobile).

The Driven International team consists of track designers, engineers, and architects, focused on the design of driving destinations.  Driven have worked closely with ASA landscape architects and Worlledge Associates (Heritage consultants) as well as collaborating with the Bicester Motion team to provide an operationally viable plan and layout for the driving tracks.



**Driven.** *Driven Projects include:*

- Nanoli Automotive Country Club, India
- Driving Experience Centre, Melbourne, Australia
- Oro Station Automotive Innovation Park, Canada
- Silverstone Rallycross, UK
- Pembrey Circuit Upgrades, Wales
- National Corvette Museum Masterplan, U.S.A

## 3. DESIGN BRIEF & CORE DESIGN PRINCIPLES

- The Experience Quarter driving facilities will provide visitors with a unique opportunity to understand motor vehicles of the past, present and future by creating unforgettable experiences for drivers and visitors.
- The track facilities should be carefully arranged in consideration of aviation operations and activities.
- The tracks design should be sensitive to the heritage of the site. Care will be taken to manage the visual impact on the landscape and setting or heritage assets.
- The infield to the airfield should be kept free of raised obstacles to maintain the openness and suitability for aviation activities. The driving tracks will feature a continuous grass verge either side of the track to retain the openness of the existing site.
- The facilities will contain a mixture of experience tracks and driving modules designed to enhance the facilities for existing site tenants, while meeting the future needs of the high-tech mobility industry and providing a world-class automotive experience that aims to attract a diverse range of tourists and businesses to Bicester.




Document: 9203 Revision: B

# 3. DESIGN BRIEF & CORE DESIGN PRINCIPLES

The driving tracks at Bicester motion are designed for private testing, vehicle manufacturer research and development, demonstrations and launches. The track will allow users to test vehicles and their own skills in a controlled environment.

The tracks will also enable new technology to be showcased  in a controlled environment that would not be appropriate to replicate on public roads.

The driving experience tracks also offer supporting road safety modules, such as a low friction surfaces to help educate drivers on car control.

The tracks are not proposed for use for major racing activities that take place at venues such as Silverstone, these venues require additional infrastructure such as pit garages, starting lights, marshal posts,  apex kerbs,  track signal lighting and additional safety barrier requirements.

# 3. DESIGN BRIEF & CORE DESIGN PRINCIPLES

BICESTER MOTION


## MOTORSPORT CIRCUIT

- ✘ Purpose designed & built for high speed, wheel to wheel competition racing events, encouraging overtaking for spectator entertainment.
- ✘ Starting grids, pit lanes, pit garages & paddock areas
- ✘ Track infrastructure such as red/white kerbs, fences & steel guardrail
- ✘ Expansive asphalt run off & gravel beds


## DRIVING EXPERIENCE VENUE

- ✓ Designed for driving pleasure, vehicle demonstration, events, driver education and experiences in a purpose built driving environment with limited numbers of vehicles on track.
- ✓ No requirement for a starting grid, start lights, pit garages or pit lane.
- ✓ Designed to retain a natural look and feel, more reflective of a rural road with minimal infrastructure.
- ✓ Incorporates driver training exercises into the layout

BICESTER MOTION

# 4. CONCEPT TRACK LAYOUTS

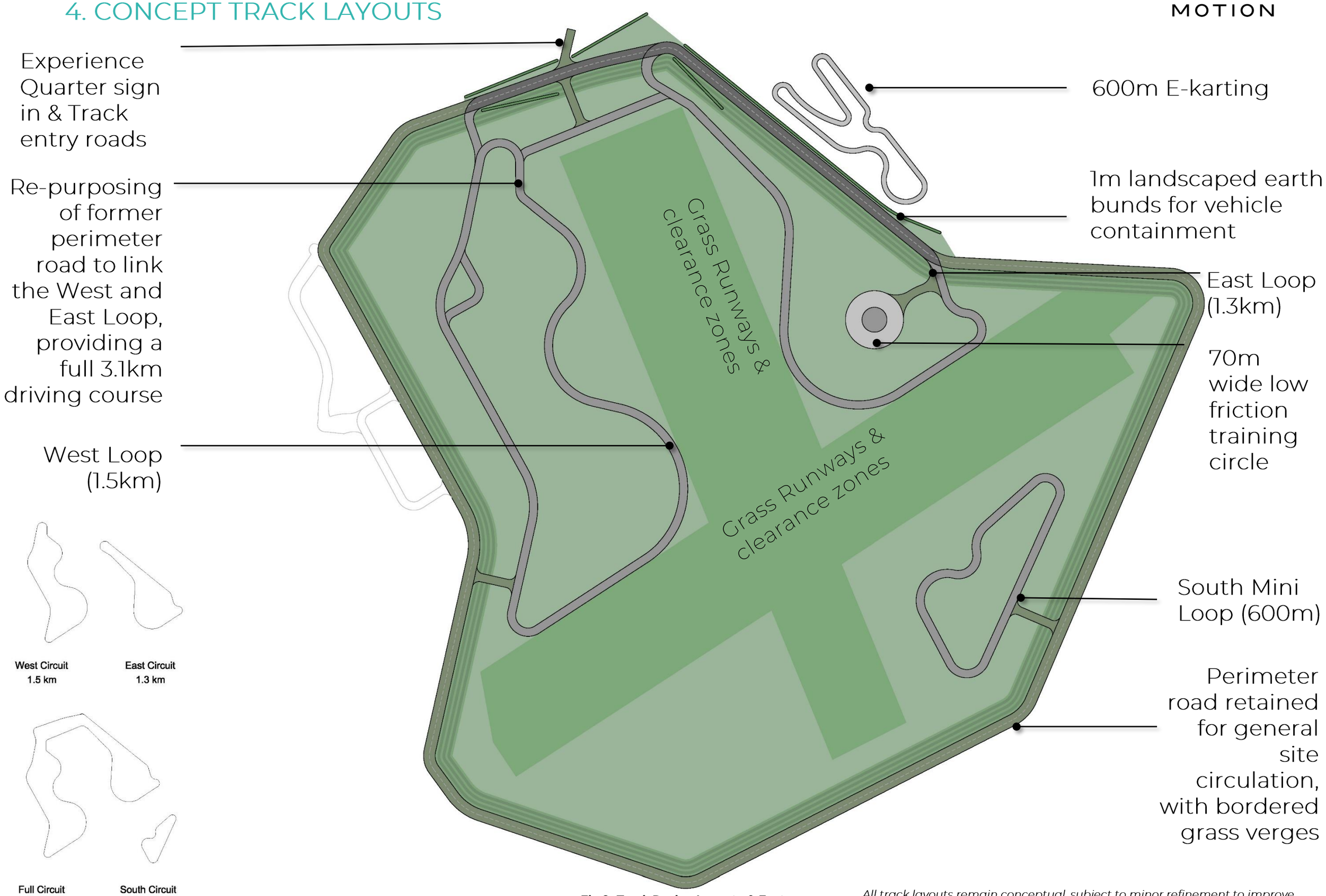


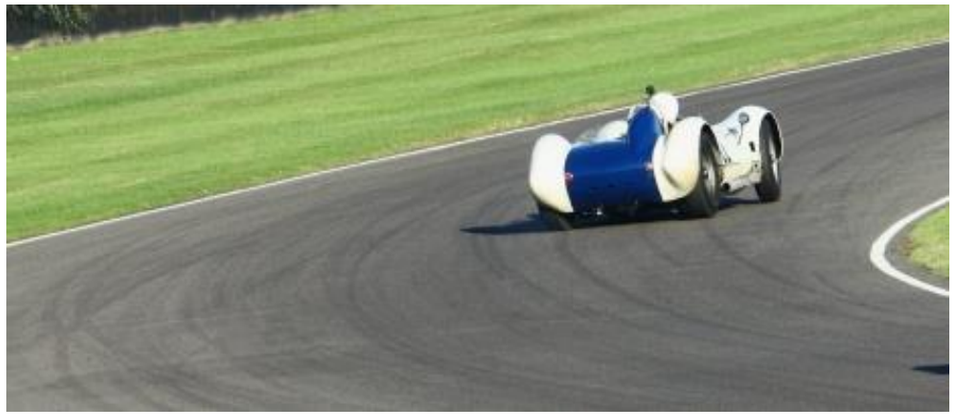

**Fig 2: Track Design Layouts & Features**

*All track layouts remain conceptual, subject to minor refinement to improve safety, aviation operations and experience quarter operational efficiency as design progresses*

# 5. DESIGN MATERIALS & INSTALLATIONS

## Track Surfaces & Edges

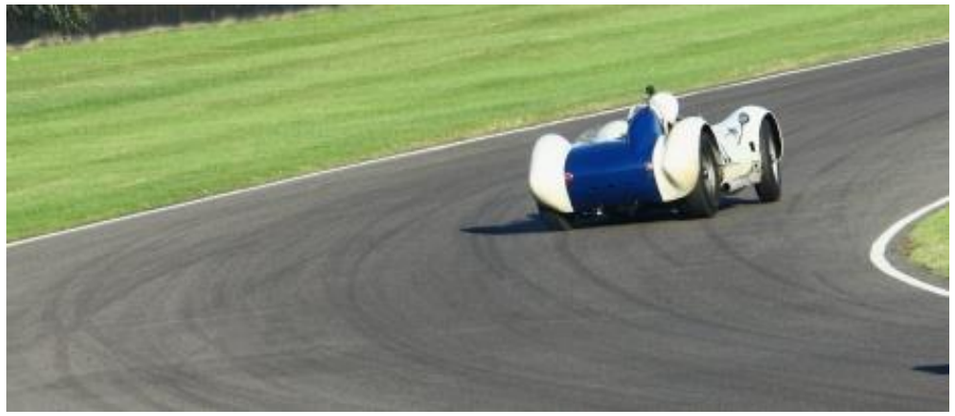
- The experience tracks will be a lightly trafficked surface being driven predominantly by track users.
- The surface will be a smooth paved (asphalt) finish similar to that seen on modern highways. The width of the existing perimeter track will be retained at 12-14m, with narrower tracks (8-11m) constructed on the infield.
- The track will be constructed with a generally level longitudinal and transverse profile, only inclined towards the inside of corners by 2% for drainage purposes.
- The edges of the track should be blended smoothly with the surrounding terrain to avoid creating a lip or ramp at the track edge. This means the track surface will be generally finished to tie in with existing ground level, thereby offering a level surface and no visual change to the airfield when viewed from a distance.
- The track edges could be delineated by a 100mm wide white line, providing a defined edge to the road.



# 5. DESIGN MATERIALS & INSTALLATIONS

## Maintained Track Safety Zones

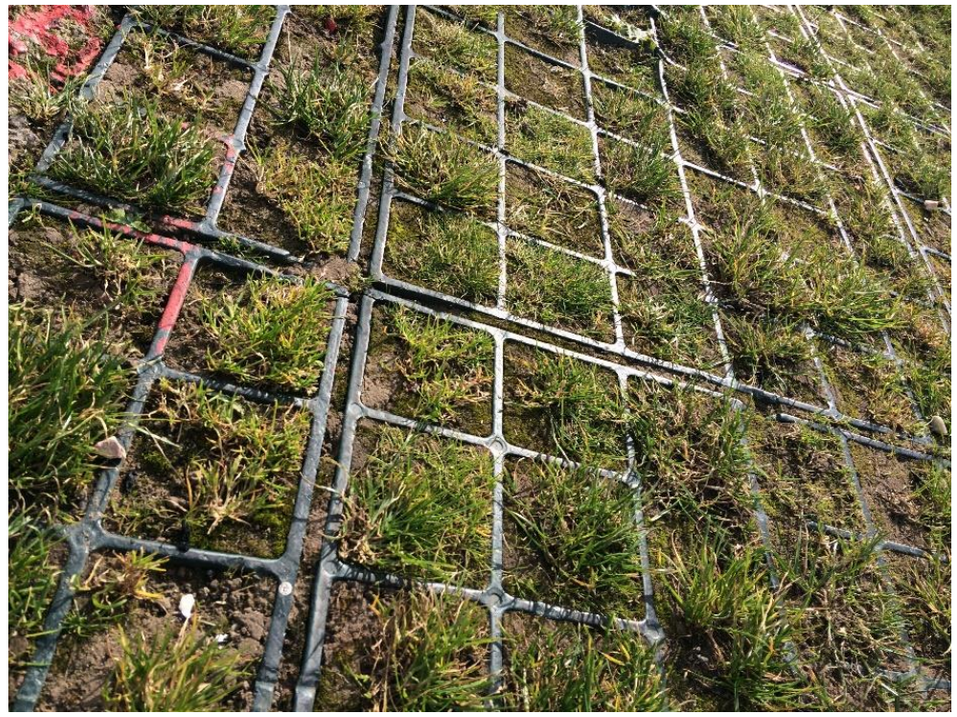
- A Maintained Grass Run-Off Area is a zone of grass placed between the track edge and the first line of protection (barrier restraint system)
- Its purpose is to minimise the likelihood of vehicles making contact with a barrier, or at least slow a vehicle down before making contact.
- Maintained Run-Off areas shall be provided through use of the existing airfield, and will remain generally untouched. These shall be graded to tie in flush with the track edges.
- These maintained areas should be smooth with no lumps and bumps and should be kept as regularly mown grass. This is complimentary to the use and expectation of an active airfield in any case.
- Careful co-ordination and planning will be required with the aerodrome, resulting in an operational plan that manages use of the track safety zones in accordance with planned aviation movements.



# 5. DESIGN MATERIALS & INSTALLATIONS

## Track Verges (Grass)

- Track verges should be a continuation of the transversal profile of the track, with no step between track and verge.
- These grass verges should aim to be at least 2m minimum width. Generally, speaking, the verge surface should be indistinguishable from that of the Maintained Run-Off Area, although their gradients may vary slightly to suit the tie-in the levels of the final track level to existing ground as smoothly as possible.
- Verges should be smooth and free of significant lumps and bumps. Their construction is to be determined with the aim of withstanding very occasional vehicle use without degradation of the surface through rutting particularly in wet conditions.
- If required, verge reinforcement can be added through local widening of the paved surfaces or typically via the use of grasscrete or similar reinforcement methods.



# 5. DESIGN MATERIALS & INSTALLATIONS

## Vehicle Restraint System: Grass Bund


## 5. DESIGN MATERIALS & INSTALLATIONS

As seen on the proposed layouts, part of the former perimeter track will be utilised for the driving experience tracks. To protect the identity of the perimeter route in these locations, and to clearly delineate it from the new infield tracks, the following design and material strategy is proposed.

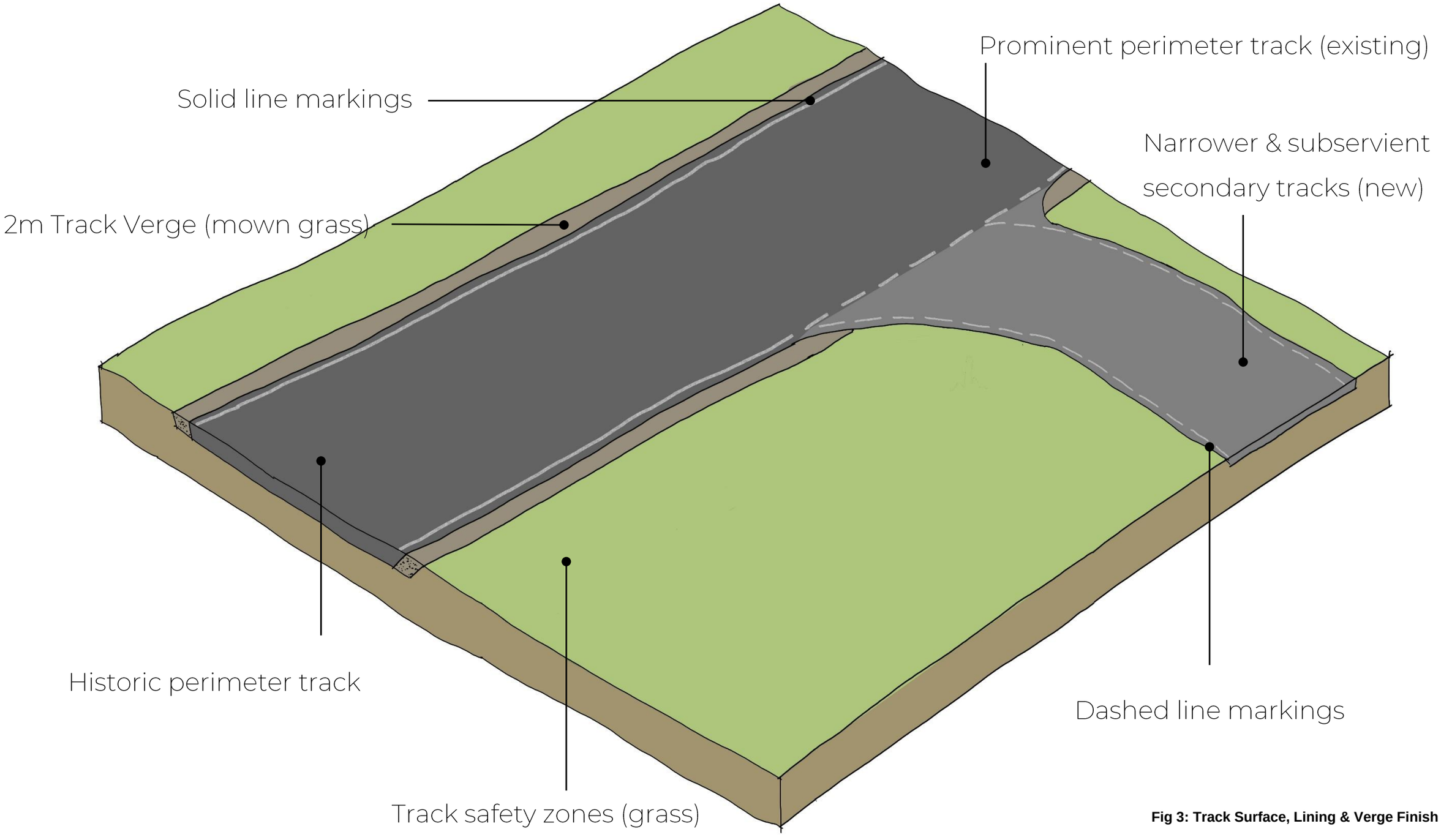
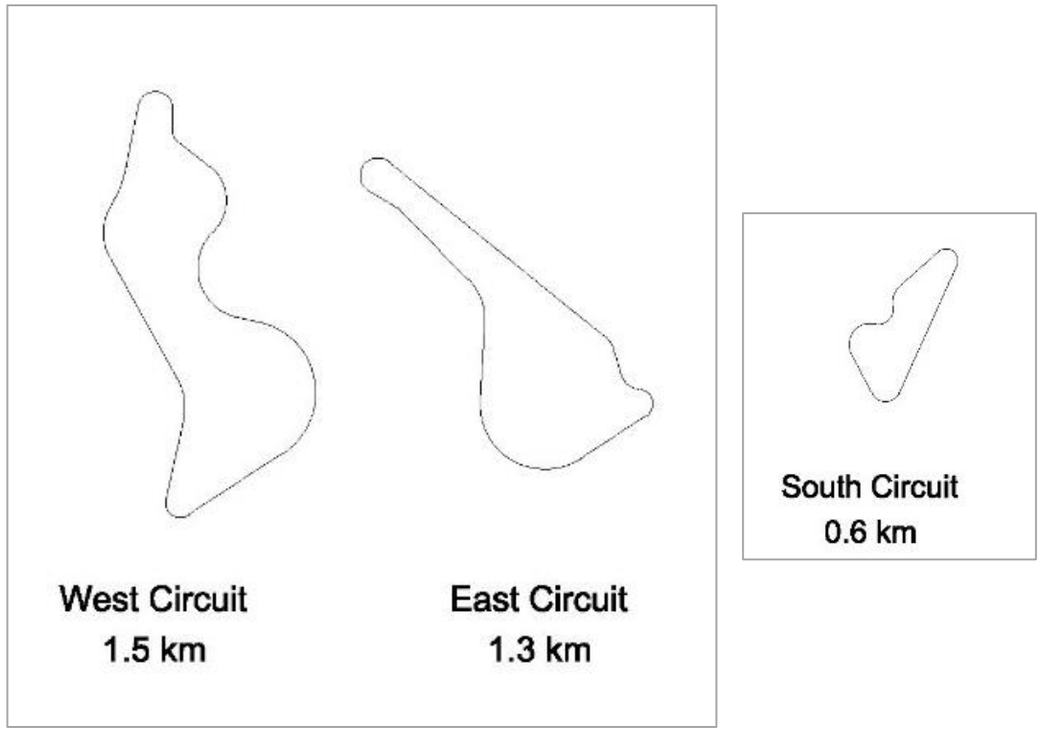
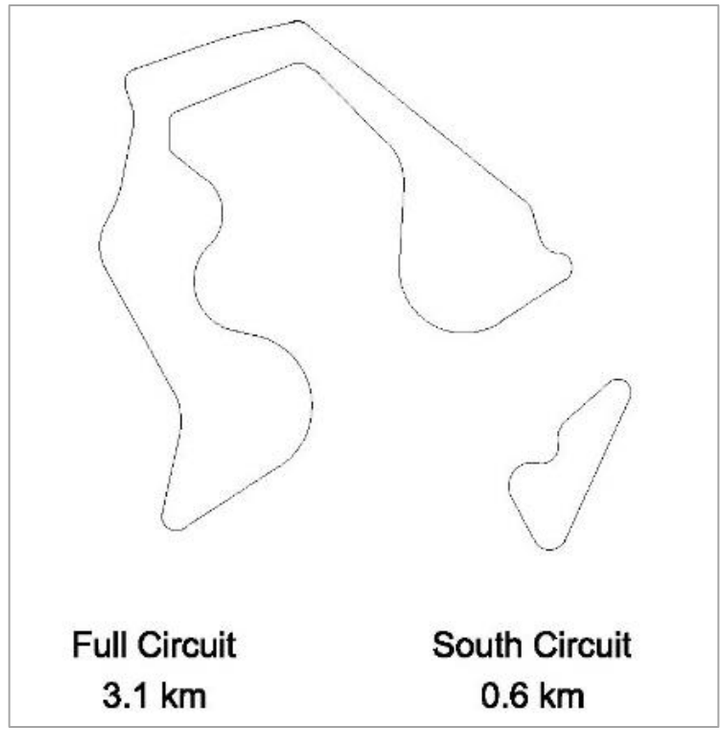



**Fig 3: Track Surface, Lining & Verge Finish**

# 6. OPERATING MODES




- Corporate & Retail Days / Brand Experience Driving
- Young Driver training days
- Future Mobility (Electric & Autonomous Vehicle) Demos
- Police and defensive driver training courses
- Road Car Driving Days
- Heritage Driving Experiences
- Professional lap rides
- ARDS training courses (using road cars)
- Vehicle shakedown testing




- Event Days only (e.g Scramble, Flywheel, Petrolicious)
- Demonstration Rides
- Exclusive Hire Testing (Road Car Autotests)
- Timed Sprint events (single car)

BICESTER

MOTION

Experience Quarter