



# HPV TRYATHLON 2023 SCHOOL'S HANDBOOK

MARYBOROUGH, VICTORIA  
NOVEMBER 22 - 25 2023

[Version 2023.02](#)

**Coordinator:** Mary Preston

## 1. OVERVIEW

The Tryathlon category was created in 2001 for teams who wanted a taste of the Energy Breakthrough. Since its creation the category has quickly grown in popularity and competitiveness.

Challenge: To excel across a wide variety of challenges, including a Time Trial, Obstacle Rally and Endurance trial. Entrants use the same design requirements as for Human Powered Vehicles (HPVs).



## 2. CATEGORIES AND CLASSES

CLASS	YEAR LEVEL	TEAM SIZE	GENDER REQUIREMENTS	SCHOOL SIZE
A	Years 1 - 6	Min 6- Max 10	At least 50% female.	N/a
B	Years 7 - 10	Min 6 - Max 8	At least 50% female.	N/a
C	Years 11-12	Min 6 - Max 8	At least 50% female.	N/a
All Female	Up to Year 12	Min 6 - Max 8	Female only	N/a
Open	Up to Year 12	Min 6 - Max 8	No gender requirements.	N/a

### 2.1 Team Composition

- All entries are to be team entries and must consist of current school students.
- The program is for young people enrolled in a school or young people enrolled in a secondary school certificate/program and under 20 years of age as of 31 December.
- [Only school-based teams or teams representing educational institutions will be permitted to enter.](#)

Teams in the Tryathlon A categories will consist of:

- a minimum of six (6) and a maximum of ten (10) riders.

- of whom at least half must be female.

Teams in the Tryathlon B/C categories will consist of:

- a minimum of six (6) and a maximum of eight (8) riders.
- of whom at least half must be female.

Teams in the Tryathlon Open classes will consist of:

- a minimum of six (6) and a maximum of eight (8) riders.
- no gender requirements.

Teams in the Tryathlon All Female classes will consist of:

- a minimum of six (6) and a maximum of eight (8) riders.
- A gender requirement of all females.

## 2.2 Category caps, changes and waitlists:

- A maximum of three entries per school will be accepted in any category.
- Additional entries from a school will be placed on a waiting list and will be notified if accepted into the event.
- Teams registered in the Tryathlon A or B/C class who request a transfer to the Tryathlon Open class will incur a 15-lap penalty in the endurance trial.
- Only one entry per school will be accepted in the Tryathlon Open classes.
- Schools that have an existing entry in the Tryathlon Open classes will not be able to enter additional teams into this class.
- Schools who won their class overall in the event previous, will be entitled to a guaranteed place for the following year. Team Managers will receive an email to advise of the process. If the team accepts the entry an invoice will be issued. If the overall winner of a class does not want their automatic entry, this WILL NOT pass onto the second placed team.
- Correspondence regarding the status of entries on a waiting list will be made directly to a Team Manager only.

## 3. ASSESSMENT

### 3.1 Overview

The Energy Breakthrough is unique in that all teams must compete across three areas of assessment: Design and Construction, Display and Presentation and Trials.

In the Tryathlon, Teams participate in the Display & Presentation Design & Construction sections, but also in three physical tests: Time Trial, Obstacle Rally and an 8 Hour Endurance Trial.

All sections must be attempted and points are awarded in the following sections:

SECTION		POINTS
Display & Presentation		20
Design & Construction		20

Time trial	15
Obstacle	15
Endurance Trial	30
Total	100

It is the responsibility of each team to ensure they complete all sections.

The schedules for each of these sections are outlined in this Handbook; timetable details for the event will be provided in an Information Kit distributed in November.

### 3.2 Scrutineering

All vehicles must go through scrutineering which entails a safety inspection to ensure the vehicles are safe and meet all the design specifications outlined in the relevant Section of this Handbook. These checks ensure that the vehicle is safe for the occupant, other teams and spectators.

Scrutineering is led by Scrutineers, with support from experienced volunteers.

Where entries do not comply with specifications, or are considered unsafe, scrutineers will provide assistance and/or direction with work required in order to comply.

Schedules and locations for teams to complete scrutineering and other judging assessments are provided in the Information Kit distributed to schools in early November.

Organisers will assume that teams will have arrived in Maryborough and be available from 12 noon on the day of the assessment. Late arrivals will be accepted only by negotiation.

### 3.3 VicRoads Participant Licence

All team members are required to present their Licence to the VicRoads station at the start of Scrutineering & Design and Construction process at Maryborough.

If no licence is presented, any number of riders in your team will be required to demonstrate competence in vehicle control by undergoing a tough test. Safety is the number one priority at the Energy Breakthrough.

By signing the Licence, the Team Manager and Principal both certify that the student has completed the necessary track safety, vehicle maneuverability training and has read and is familiar with the Trial regulations.

Download the VicRoads Participant License under 'Team Managers Hub'.

### 3.4 Design and Construction



#### Purpose

The focus of the Design and Construction is to assess the student's understanding of the vehicle and the concepts involved in its design and construction.

Note: A one point improvement in this assessment area can equate to an additional 20 laps on track in the trial elements, based on historic records.

#### Format

At a scheduled time, each team of students will be asked a series of questions by two or three judges.

These questions are framed in an informal 'workshop-style' discussion, where students can point to various aspects of their vehicle to explain the design and construction concepts to the judges.

The students and judges typically stand around the vehicle during this assessment, which typically takes between 20 mins - 25 mins per team.

#### About the Judges

The judges are all volunteers who are typically:

1. a community representative,
2. a person with an interest in education, technology, and / or engineering, or
3. a past participant of the Energy Breakthrough.

#### Criteria

As part of the Design and Construction assessment, teams will be scored against the following criteria:

- Effort and input
  - This is based on issues such as whether the vehicle bought, made from new, modified from the previous year and to what extent the students were involved in the various aspects of design and construction.
  - It is understood that the levels of student involvement in the technical and practical activities related to the design and construction of an entry will vary with age.
  - Teams can show design drawings and models to demonstrate work undertaken by students.

- Teams who have simply purchased a recumbent bicycle (complete or in kit form) and carried out basic modifications, will not score as well as teams who have built a vehicle from scratch.
- Consideration will be given to teams who have 'Inherited' a vehicle from previous teams, but who have improved the design and/or construction in some way.
- Innovation and Quality
  - How effective/clever the design concepts are,
  - the materials used,
  - construction methods,
  - types of gears, brakes and steering.
- Understanding
  - discuss and explain design and construction processes,
  - key design concepts,
  - the materials,
  - components & running set-up.
- Safety: Design and Understanding
  - show all rider safety equipment, including each person's gloves, helmets and glasses,
  - discuss the use of restraints,
  - roll bars,
  - rider protection,
  - visibility.
- Practicality, Stability & On-road Performance
  - vehicle reliability,
  - handling,
  - lighting.
- Driver Training and Skills Development
  - presentation of licences for each team member,
  - skills covered in driver training including driving at night, in the wet, etc.
- Understanding of Environmental Issues
  - the relationship between transport and issues including greenhouse, air pollution, electric vehicles, and the importance of renewable energy, etc.
- Vehicle Weight
  - Weight is an important factor in efficiency.
  - HPV's and EEV's will be weighed and scored based on their weight compared to other teams.

## Display and Presentation

## Purpose

The purpose of the Display and Presentation is for team members to demonstrate their knowledge and understanding of their entry and the story of their journey throughout the year to the Energy Breakthrough.

This aspect represents 25% of a team's total score in HPV Primary, HPV Secondary and EEV classes. This aspect represents 30% of a team's total score in Pushcarts and 20% in HPV TRYathlon

Note: A one point improvement in this assessment area can equate to an additional 20 laps on track in the trial elements, based on historic records.

## Two options for Submission (A and B)

Following two COVID-19 disrupted years, the Energy Breakthrough offered a new option for secondary schools in 2022 through a video presentation submitted prior to the event.

This new option is a chance to reinforce the educational aspect of the program by preparing and submitting a Display & Presentation Video Prior to the Event.

The aim of both the video and the in-person presentations will be to showcase and emphasise the school's journey over many months leading up to the Energy Breakthrough.

### OPTION A: In-Person At Event

**Duration: 20 minutes, plus 5 – 10 minutes of Q&A**

- Each team will be required to present for a maximum of 20 minutes to a panel of judges.
- This will be followed by 5 - 10 minutes of questions from the judges.
- [Option A is NOT available to Pushcart teams.](#)

### [OPTION B: Video Pre-Event – HPV Secondary, EEV and TRYathlon Secondary](#)

[Duration: 10 minutes, plus up to 5 minutes of Q&A](#)

- [Only available to Human Powered Vehicles Secondary, Energy Efficient Vehicle teams, and HPV TRYathlon Secondary](#)
- [Each team Human Powered Vehicles Secondary, Energy Efficient Vehicle teams, and HPV TRYathlon Secondary selecting this option will be required to submit a video of a maximum of 10 minutes.](#)
- [This will be followed by impromptu questions asked by teachers with questions set by the Energy Breakthrough team.](#)

### [Notes:](#)

- [Both options still represent the same percentage of the team's total score.](#)
- [All teams must complete either OPTION A OR OPTION B \(not both\).](#)
- [Schools completing OPTION B will not be scheduled to present 'in-person' at the event.](#)



- [The general information regarding the purpose, criteria and aspects of assessment will remain the same. However, the Video Pre-Event Presentation will be created digitally throughout the year and submitted prior to the event.](#)

### **Specific Information - Option A: In-Person At Event**

#### **Space:**

Each team is provided an approximately 4 metre by 4 metre space to present within, with one wall to affix display materials.

#### **Schedule:**

A specific time for each team to complete their Display & Presentation will be published prior to the event. Each team is allocated time to set up their display prior to their time.

Event schedules will require teams to have arrived and be available from 12 noon on the day of the assessment. Late arrivals will be accepted only by negotiation.

### **Specific Information - Option B: Video Pre-Event**

#### **Video Format**

The video is to have all students participating and sharing of the student's work in the visual display.

Students are encouraged to utilise any media skills they have but it is important to understand that it is criteria of Display and Presentation that will be assessed and not their media skills.

#### **Impromptu Questions**

The impromptu questions will be supplied by the Education Planning Group, but asked by the teacher and recorded at the end of the video submission.

The questions will be sent to the teacher via email [early in term 4](#), once an expression of interest from the school has been received.

It is expected – based on an honesty policy – that students will NOT have seen the questions before hand.

In the case that there are two teams, then there will be two separate sets of questions provided.

#### **Submission**

Details and processes for uploading video submissions will be provided to participating schools.

The Energy Breakthrough team will work with schools to ensure that technology is not a barrier to participation for schools.

#### **Publication**



The top three video presentations will be published on the Energy Breakthrough website. Permission will be sought from the relevant schools prior to publication.

**Deadline:**

[All video submissions are to be uploaded by 5.00pm on Friday 3rd November.](#)

## **General Information (Covers both Options A & B)**

### **Technology Use & Distractions**

Schools are encouraged to be innovative in their presentations. However, care needs to be taken to ensure that 'distractions' do not overtake the real purpose, that is, 'students demonstrating their understandings'.

To reduce interference from nearby panels, no public address or small music (CD) systems will be allowed [at In-person at Event Presentations](#) without prior approval of the Display & Presentation Coordinator.

### **About the Judges**

The judging panel are all volunteers who typically consists of three members:

4. a community representative,
5. a young person with an interest in education and/ or technology, and
6. an education/teacher representative.

These judges will ask the questions of team members following their formal presentation.

### **Participation**

All registered team members are required to participate equally in the presentation. Teams may choose to include up to two (2) additional students (i.e. support crew) to join their registered team members in their presentations. However, the presentation roles must still be shared equally by all participating team members.

### **Criteria**

The assessment covers both in person oral report, visual display and video aspects.

Judges are asked to look for evidence of:

- Student involvement.
- Levels of participation.
- Team work and enthusiasm.
- Individual contributions.
- Understanding of the project.

It is understood that the levels of student involvement in the technical and practical activities related to the design and building of an entry will vary with age.

[The Option video display will be specifically judged with an emphasis on:](#)

- [Extent of coverage of the journey for the team throughout the year](#)
- [Demonstration of the students in action](#)
- [Vehicle development](#)
- [working with the community \(eg sponsors\)](#)
- [the variety of Information](#)
- [demonstration of the criteria as listed in the Oral report](#)

[Note: the video presentation should NOT be simply a Presentation that would have been delivered at the event.](#)

## Oral Report

The [oral report](#) will be assessed according to:

This oral report should relate to the development of the team entry, including ideas that did not work and why.

### Presentation Style:

- The introduction and outline of the presentation;
- awareness of the audience;
- style of presentation (reading from notes or reciting);
- clarity of language;
- use of materials,
- diagrams and models covered.

### Team Work:

- The effectiveness of leader's role; sharing of knowledge and responsibility in the team;
- acknowledgment of individual team members' role;
- team attitude and enthusiasm, and
- the extent to which the presentation reflects the students' own work.

### Knowledge and Understanding:

- Knowledge of the aims and values of the Energy Breakthrough;
- team planning;
- preparation and training, and
- technical aspects of the development of the vehicle.

### Development of a Story:

The "story" of the team and the entry throughout the year, including:

- the challenges;
- the preparations;
- the school and community's involvement, and
- the students' achievements.

## Visual

The visual display should include photos, videos, models, prototypes etc to explain the involvement of students, school, community and/or industry in the program and the development of their entry.

The visual display will be judged according to:

Layout and Organisation:

The range of visual media and written text depicting:

- vehicle development;
- the arrangement of items;
- the variety of information presented, and
- the acknowledgment of sponsorship/financial support received.

Quality of Display:

The effective use of the following to convey messages:

- diagrams and drawings,
- models,
- photos,
- text, etc

### 3.6 The Trials

In this section, the operation of each entry will be tested. Tryathlon teams will tackle a Time Trial, Obstacle Course and an 8-hour Endurance Trial.

#### Challenge 1: Time Trial

Location: Track 1 [near Skate Park](#) (See attached map)

Circuit Length: Approx. 600 metres per lap

Event Format: One round – 8 Riders

- There will be three or four teams per heat, each from the same class.
- Riders will each complete one lap of the Time Trial circuit before changing over in the allocated pit areas under the direction of the track marshals.
- For Tryathlon A teams with 9 or 10 riders, 8 riders will participate in this challenge. It is a requirement that those riders omitted from this challenge will participate in the Obstacle Rally.

Points Allocation for Time Trial

- Points will be allocated on the total team time recorded.  
That is: 15 points to the team recording the fastest time.

$$\text{Time Trial Score} = 15 - \left[ \left( \frac{X - Y}{Y} \right) \times 15 \right]$$

- Where Y = fastest team time recorded & X = team's own time

#### Challenge 2: Obstacle

Venue: [Track 2 – Front Straight](#)

Circuit Length: Approx. 600 metres per lap

Event Format: One round – 8 Riders.

- Each team will complete the Obstacle Rally, which will incorporate several stations or control challenges:

#### Minefield

- The classic test of handling! How fast can your riders navigate a scattering of witches hats across the track, without hitting one. There is typically two or three paths through, so take your pick and commit!

#### Rumble Strip

- It's been part of the Tryathlon for a number of years now and creates a great buzz for the riders. There's a 'chicken run' here if riders aren't too sure.
- New obstacles may also be introduced each year to keep the challenges 'fresh' and exciting!
- Riders will each complete one lap of the Obstacle Rally circuit before changing over in the allocated pit areas under the direction of the track marshals.
- For Tryathlon A teams with 9 or 10 riders, 8 riders will participate in this challenge. It is a requirement that those riders omitted from this challenge will participate in the Time Trial.

#### Points Allocation for Obstacle

$$\text{Obstacle Rally Score} = 15 - \left[ \left( \frac{X - Y}{Y} \right) \times 15 \right] - \text{Penalty}$$

- Where Y = fastest team time recorded (in seconds) & X = teams own time (in seconds).

#### Obstacle – Penalties & Infringements:

Infringement	Penalty Points
Contact with hay bale or barrier, loose seat belt and/or helmet,	0.2
Careless driving, contact with other vehicle, no seat belt, no helmet, incorrect pit change over	0.5
Very dangerous driving	1

#### Challenge 3: Endurance Trial

Venue: [Track 1](#)

Primary: Thursday with the HPV Primary teams.

Secondary: Saturday with the HPV Secondary and EEV teams.

Circuit Length: [1.58](#) km per lap

Duration: 8 hours

- Teams will compete in a Trial event over eight hours.
- Each rider is encouraged to complete at least 30 minutes riding.

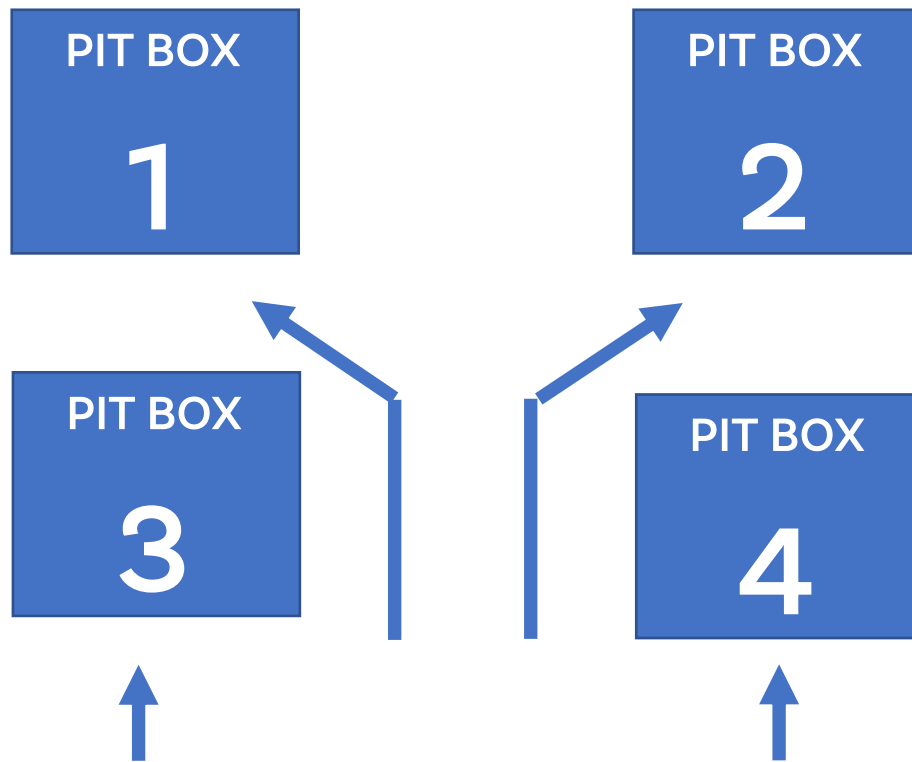
- Teams assemble as directed and the trial will commence with a rolling start behind the lead vehicle.
- For Tryathlon A teams with 9 or 10 riders, all riders may participate in the Trial..
- In 2023, the TRYathlon Endurance components for TRYathlon Primary teams will be held in conjunction with the HPV Primary team's 16 hour Trial. TRYathlon Primary teams will only participate on the Thursday of this event from 9am – 5pm.
- In 2023, the TRYathlon Endurance components for TRYathlon Secondary teams will be held in conjunction with the HPV Secondary team's 24 hour Trial. TRYathlon Secondary teams will only participate in the first 8 hours of the Saturday of this event from 12noon – 8pm.
- For TRYathlon Secondary, at the conclusion of their 8 hour Endurance Trial, timing will cease for TRYathlon teams and they will be required to come into pit lane.
- TRYathlon Secondary teams will need to consider and plan how they can bump out their Pit resources and equipment whilst the 24 Hour Trial continues OR leave their equipment until AFTER the 24 hour trial concludes on Sunday at 12noon.

#### Points Allocation - Endurance Trial

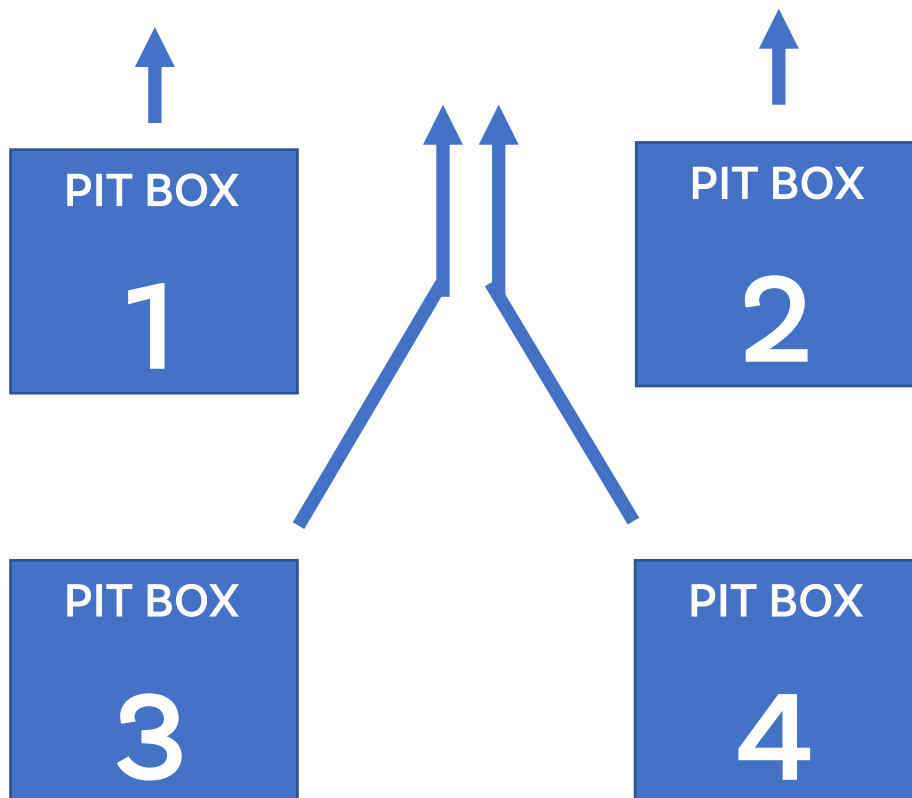
- Points will be allocated on distance completed by the team. That is, 30 points to the team recording most laps.
- Other finishers: (X/Y) multiplied by 30 = points
- Where Y = highest number of laps recorded & X = team's number of laps.

TRY-ATHLON PIT PROCEDURES FOR  
TIME TRIAL AND SPRINT EVENTS

Pit Entry:



Pit Exit:



### 3.6.1 The Circuits

There are two tracks in Princes Park, Maryborough surrounding the beautiful Lake Victoria. On both tracks there are some unlit sections at night, and the sealed surfaces are not “billiard table smooth”.

#### Track 1

Track 1 is a challenging 1.58 km street circuit that reflects real-world conditions.

Track 1 will be used for the [Tryathlon Time Trial & Endurance events](#).

#### Track 2

The Regional Roads Track (RRV Track), is located between the Maryborough Caravan Park and the Princes Park oval.

This track will be used for the [Tryathlon Obstacle Event teams](#).



## TRY-ATHLON

*\* Schedule subject to change*

*Primary TRYathlon teams will follow the HPV Primary Program.*

*Secondary TRYathlon teams will follow the HPV Secondary Program.*

### TUESDAY 21 NOVEMBER

<a href="#">3:00pm – 6:00pm</a>	<a href="#">Teams arrive and set up camp</a> <a href="#">Group: TRY Primary</a>
<a href="#">3:00pm – 6:00pm</a>	<a href="#">Registration Opens</a> <a href="#">Location: Administration Centre</a>

### WEDNESDAY 22 NOVEMBER

All Day	Teams arrive and set up camp <a href="#">Group: TRY Primary</a>
<a href="#">8.00 am</a>	<a href="#">Registration Opens</a> <a href="#">Location: Administration Centre</a>
<a href="#">9.00 am - 5.00 pm</a>	<a href="#">Scrutineering, Design and Construction, Display &amp; Presentation</a> <a href="#">Group: TRY Primary and HPV Primary</a> <a href="#">Location: EB Central</a>
<a href="#">6.00 pm – 6.30 pm</a>	<a href="#">Team Managers and Marshals Meeting</a> <a href="#">Group: TRY Primary and HPV Primary</a> <a href="#">Location: Stage, Track 1</a>
<a href="#">6.30pm – 8.30pm</a>	<a href="#">Practice Session</a> <a href="#">Group: TRY Primary and HPV Primary</a> <a href="#">Location: Track 1</a>

### THURSDAY 23 NOVEMBER

All Day	Teams arrive and set up camp <a href="#">Group: TRY Secondary</a>
8:00am – 9:00am	Grid Formation <a href="#">Group: TRY Primary and HPV Primary</a> <a href="#">Location: Front straight, Track 1</a>
9.00 am - 5.00 pm	8-hour Endurance Trial <a href="#">Group: TRY Primary and HPV Primary</a> <a href="#">Location: Track 1</a>
<a href="#">6.00 pm – 6.30 pm</a>	<a href="#">Team Managers and Marshals Meeting</a> <a href="#">Group: TRY Secondary</a> <a href="#">Location: EB Central</a>

### FRIDAY 24 NOVEMBER

<a href="#">9.00 am – 12:00pm</a>	<a href="#">Scrutineering, Design and Construction, Display &amp; Presentation</a> <a href="#">Group: TRY Secondary and HPV Secondary &amp; EEV</a> <a href="#">Location: EB Central</a>
-----------------------------------	--

<a href="#"><u>1:00pm – 2:30pm</u></a>	<a href="#"><u>Obstacle Rally – Round #1</u></a> <a href="#"><u>Group: TBA</u></a> <a href="#"><u>Location: Track 2</u></a>
<a href="#"><u>1:00pm – 2:30pm</u></a>	<a href="#"><u>Time Trial – Round #1</u></a> <a href="#"><u>Group: TBA</u></a> <a href="#"><u>Location: Skate Park end, Track 1</u></a>
<a href="#"><u>2:30pm – 3:00pm</u></a>	<a href="#"><u>Changeover Time</u></a>
<a href="#"><u>3:00pm – 5:00pm</u></a>	<a href="#"><u>Obstacle Rally – Round #2</u></a> <a href="#"><u>Group: TBA</u></a> <a href="#"><u>Location: Track 2</u></a>
<a href="#"><u>3:00pm – 5:00pm</u></a>	<a href="#"><u>Time Trial – Round #2</u></a> <a href="#"><u>Group: TBA</u></a> <a href="#"><u>Location: Skate Park end, Track 1</u></a>
<a href="#"><u>6:30pm</u></a>	<a href="#"><u>Try-athlon Awards Ceremony (Primary)</u></a> <a href="#"><u>Location: EB Central</u></a>
<a href="#"><u>7.30pm – 9.30pm</u></a>	<a href="#"><u>Practice Session</u></a> <a href="#"><u>Group: TRY Secondary</u></a> <a href="#"><u>Location: Track 1</u></a>

#### SATURDAY 25 NOVEMBER

11:00am – 12:00am	Grid Formation <a href="#"><u>Group: TRY Secondary and HPV Secondary</u></a> <a href="#"><u>Location: Front straight, Track 1</u></a>
12.00 am - 8.00 pm	8-hour Endurance Trial <a href="#"><u>Group: TRY Secondary and HPV Secondary</u></a> <a href="#"><u>Location: Track 1</u></a>
<a href="#"><u>9:00 pm</u></a>	<a href="#"><u>Try-athlon Awards Ceremony (Secondary)</u></a> <a href="#"><u>Location: EB Central</u></a>

#### SUNDAY 26 NOVEMBER

No activities, pack up and depart.