



#### **About the Transport Accident Commission (TAC)**

The TAC is a Victorian Government-owned organisation whose role is to promote road safety, support those who have been injured on our roads and help them get their lives back on track.

The TAC covers the costs of injuries which are the direct result of the driving of a car, motorcycle, bus, train or tram, and provide support services for people injured in a transport accident as a driver, passenger, pedestrian, motorcyclist, and in many cases, a cyclist.

The TAC is committed to the prevention of road trauma, and work closely with Road Safety Partners of Victoria, to increase awareness of road safety issues, make infrastructure improvements aligned with Safe System principles and ultimately reduce the incidence of road trauma.

The Victorian Road Safety Strategy 2021-2030 commits to the ambitious target of eliminating death from our roads by 2050, with the first step of halving road deaths by 2030. Find out more about the Victorian Road Safety Strategy.

#### **About the Competition**

#### **Background**

The TAC, along with its Road Safety partners, are committed to halving the lives lost on Victorian roads by 2030. To help achieve this, the TAC is seeking innovative solutions and the application of Safe System principles to road design projects. This approach supports the commitment of the National Road Safety Strategy 2021-2030 in strengthening all elements of our road transport system under four key themes: Safe roads, Safe vehicles, Safe speeds and Safe road use.

#### A safer future starts with you.

Students entering the industry can make long-term changes necessary to ensure safety is a central consideration for how we design and deliver safer roads across Australia.

#### **The Challenge**

The Future Road Competition follows a real-world infrastructure project in Victoria within the TAC Safe Local Roads and Streets Program.

There are many types of road safety programs, and this program is targeted at local councils across Victoria who bid for projects to improve the safety of their local road network. One of these projects has been selected and this real-world project will run in parallel with the Future Road Competition.

Engineering students from Victorian Universities will participate to put their skills to the test and help prevent lives lost on our roads.

The Competition Brief will reference key parts of the real-world program funding guidelines and project information to assist students with their response to the brief. The guidelines support the application of Safe System approaches to design solutions.

Your challenge is to propose Safe System applications to the project and demonstrate innovative thinking.

The challenge will be conducted over two stages:

Stage One	Stage One entry requirement is a concise response following an adapted rea world funding Expression of Interest (EOI) process. The EOI process will provid a short list of teams to progress to Stage Two.	
Stage Two	Stage Two invites the shortlisted teams to complete some focussed tasks and participate in a hands-on Masterclass with experts and peers.	



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#### Why participate?

The competition is an industry-led activity with unique opportunities to follow a real-world project cycle and engage with industry experts.

Overall, the Competition encourages the following opportunities:

- Gain best-practice industry knowledge required for entering the workforce
- Apply Safe System theory to a real-world project proposal
- Improve your understanding of a full project cycle from concept to delivery
- Get involved with the 'selection of treatments' and 'develop and design' project phases
- Opportunities to connect with peers and network with industry experts at the Masterclass event
- Gain professional development experience to add to your CV and interviews; and
- Be awarded with prize money

#### Meet the experts

Shortlisted teams will have the opportunity to present their work to the jury of industry experts and their peers at a Masterclass event and engage with the industry lead consultant on the delivery of the real-world project.

The Masterclass provides the following benefit to students:

- Hear from the experts
- Experience presenting to industry experts and your peers
- Participate in a live demo of an innovative Safe System geometric design process
  - Hands-on demo using CAD software, MicroStation.
  - Learn to analyse the safety levels in the design options for the real-world project using kinetic energy analysis.
- Network with peers and industry members
- Hear final announcements of winners.



#### **Competition Terms and Conditions**

Refer to the full Terms and Conditions containing all information required for participating in the Competition (<a href="https://www.tac.vic.gov.au/road-safety/tac-campaigns/future-road">https://www.tac.vic.gov.au/road-safety/tac-campaigns/future-road</a>).

#### Who can enter

Entry is only open to Competitors who at the time of entering the competition:

- Are residents of Victoria
- Are aged 18 years or older
- Are actively enrolled in undergraduate engineering courses of an Australian University
- Are not an employee, or related to an employee, of the Promoter or one of its agencies connected with this competition
- Have not had their motor vehicle license previously suspended or cancelled in the two years prior to date of entry or have more than five demerit points in the last five years

#### How to enter

#### **Register to enter**

- Form a team of two to three students
- To receive communications and updates about the competition, we encourage you to register your interest via the TAC Future Road Competition website (https://www.tac.vic.gov.au/road-safety/taccampaigns/future-road)



#### Stage One: Submit your Safe System submission (EOI)

- Use Section 3 of the Competition Brief as the background to the real-life project, to assist you in preparing a submission
- Complete Section 4 of the Competition Brief
- Attach your submission as a pdf

#### **Stage Two: Safe System Masterclass event**

#### Shortlisted submissions will:

- Be required to attend the Masterclass
- Be requested to prepare a short presentation prior to the Masterclass with an overview of the Stage One submission
- Teams will be provided concise supporting material to assist presentation preparation
- Be invited to present their presentation to their peers and a panel of industry experts
- The presentation shall be no longer than 10-minutes
- No more than 10 slides should be used
- Presentations will be required to be submitted in pdf format one week prior to the Masterclass
- Presentations should be presented at the Masterclass in a PowerPoint format

#### **Submission Format**

- Submission must be entered before the close of the Competition Submission period
- Only one submission should be entered per team
- Competitors must respond to all Stage One questions
- Only shortlisted teams will be required to complete Stage Two presentations



#### **The Prize**

To reward you for your Safe System approach thinking, the below prizes will be awarded at the Masterclass, as determined by the panel of judges in accordance with the Evaluation of Submissions.

#### 1st Prize

- \$5000 cash reward
- Public recognition as winners by TAC

#### 2nd Prize

- \$3500 cash reward
- Public recognition as runner up by TAC

#### 3rd Prize

- \$1500 cash reward
- Public recognition as third place by TAC

#### **Competition Timeline**

Stage	Milestones	Date	Activity
Stage One	Form a team and register your participation	14 July – 18 August	All participants are encouraged to register via the TAC website to receive timely updates and communications
	Submissions Open	21 July	Review the competition brief and begin preparing your submission
	Q&A period	14 July – 18 August	Submit any questions regarding the Brief & Conditions
	Submissions close	25 August	Submit your submission via pdf on the TAC website
	Shortlisting period	25 August – 4 Sept	Panel of industry experts to review all submissions and complete judging process
	Shortlisted teams informed	5 Sept	TAC requires all shortlisted participants to be verified and pass a licence check
Stage Two	Prepare for the Masterclass	5-14 Sept	Shortlisted teams prepare a short presentation
	Submit Submission Presentation	15 Sept, 10am	Submit pdf presentation via email
	Participate in the Masterclass	24 Sept	Present your submission at the Masterclass Award announcements
			Award announcements



#### **Judging Process**

A panel of industry experts have been selected to assess the submissions and pick a Shortlist for Stage Two.

The Evaluation Criteria will form the basis of the panel's decision.

The following judging process will take place:

- The judging panel will judge the Stage One submissions
- Six (6) teams will be shortlisted and invited to attend the Masterclass
- The top three (3) shortlisted teams will be invited to present their proposal at the Masterclass for the finalist judging
- Winners and prize holders will be determined and announced at the Masterclass event

#### **Evaluation of Submissions**

Stage	Evaluation Components	Weighting
Stage One	Target User Groups	10%
	Design Options	35%
	Safe System Alignment	35%
Stage Two	Masterclass Presentation	20%



#### **Questions and Answers (Q&As)**

Q&A entries will be open throughout Stage One and Stage Two (presentation preparation phase only). All Registrants may ask questions in the Q&A.

#### All questions:

- Must be sent to futureroad@graffiti.com.au
- Must be submitted within the time specified in the Competition Timeline
- Will be responded to as soon as possible by the Competition team and/or industry experts
- Questions and answers will be sent to all teams

#### **Competition Scope - Qualifications**

- The Competition involves concept designs which are for the purposes of the Competition only
- Safe System professionals will be engaged to undertake the design work, and your thinking approach may be relevant and useful in that work
- Competitors are not required to visit the site to participate in the Competition
- Students are encouraged to use available resources to complete their response
- Competitors are not permitted to contact the City of Greater Bendigo regarding the Competition, for any purpose such as to gain additional insight, information or details



#### 1. What is the Safe System?

Australian governments have committed to a vision of zero deaths and serious injuries by 2050 (Vision Zero).

The 2050 Vision Zero statement represents a stronger commitment to the Safe System approach which is supported internationally.

The 2021-2030 Victorian Road Safety Strategy outlines an approach to road safety that is built around a Safe System approach. The approach is coordinated to include all the Road Safety Partners of Victoria.

Safe System principles aspire to zero lives lost and serious injuries on our roads. The approach avoids economic motives and prioritises human life above all else.

The guiding principles behind the approach are:

- People make mistakes a mistake should not cost anyone's life or health
- Human physical frailty humans cannot withstand crash forces
- Design a 'forgiving' road transport system

The Safe System acknowledges that humans will continue to make mistakes and crashes will occur. With the combination of the Safe System pillars, energy shall be managed such that harm does not occur in the event of a crash. This is called 'system design'.

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The Safe System model is typically represented by the following image.



Figure 1 - The Safe System Model

Austroads definition of Safe System design.

#### **Kinetic Energy**

In Safe System terms, the 'why and how' relate to reducing harm by the management of kinetic energy. Understanding kinetic energy is a key foundation to this Competition.

There are adequate resources available that describe the science of kinetic energy management in road engineering that can firstly avoid a crash, and in the instance of a crash, manage the outcome to avoid human harm.



#### **Real-World Application**

The Competition provides an example of industry application of Safe System design and will also encourage innovative thinking.

This in turn aligns graduate learning with industry needs. Safe System road design is still evolving in its application, and it is crucial that today's engineering graduates understand and can apply these elements of the Safe System approach to shape the future of our road system.

Investing in Safe System capability and capacity in today's graduate engineers invests in eliminating harm on our roads by 2050.

The competition will follow the real-world project in real-time and offer you the opportunity to experience phases of project development.

#### 2. Safe Local Roads and Street Program

The TAC, in partnership with the Department of Transport and Planning, have developed the Safe Local Roads and Streets Program to support the development and delivery of road safety infrastructure projects on local roads.

This \$200 million program is designed to integrate local governments' priorities with a Safe System approach.

The program will run from July 2023 to June 2027. Over this time, the TAC will work with all Victorian local governments to plan, design and deliver \$200 million of safety improvements on the highest-risk local roads, intersections and precincts, such as schools.

Safe Local Roads and Streets program encourages the implementation of safety-related traffic management techniques and other road safety measures that have proven road safety value, including Safe System alignment.

#### **Treatment Philosophy**

The complete elimination of systemic risk on our roads is not achievable in the near-term future. Thus, upgrades will be progressively rolled out starting with the highest risk areas. The most appropriate treatment will depend on where the area/road lies in the Movement and Place framework.

These treatments should be supplemented where appropriate with targeted communications that explain to the community how they address the road safety issue, how they work and their benefits.



#### **Guiding Principles**

Key elements of the guiding principles include:

- The most effective way to reduce risk is to eliminate a road user's exposure to crashes, such as closing a street or intersection to vehicles, restricting high risk movements, or separating vulnerable road users (pedestrians and cyclists) from higher speed traffic (e.g. separated bicycle paths, grade separated pedestrian facilities)
- If exposure cannot be eliminated, treatments that reduce the severity of crashes should be used to bring the energy of a collision below the relevant Safe System injury threshold
- Innovation is encouraged if it can achieve better alignment with Safe System principles through lower cost, or more effective or desirable treatments

#### 3. Real-World Project Information

#### **Case Study**

This Competition follows the City of Greater Bendigo council's real-life project proposal for the Safe Local Roads and Streets Program. The project submission is for the Rowan, MacKenzie, View and Forest intersection upgrades.

This real-life project will generally run in parallel with the funding program and the Competition. The guidelines provided will assist student entries to develop Safe System aligned design solutions.

This competition will focus on only one of the above-mentioned intersections.



#### **Project Cycle**

The Safe Local Roads and Streets Program guidelines inform Councils about the project development cycle and provide an overview which is provided below in Figure 2.

In this real-life project this Competition will have a focus on the following two phases:

- 'Select treatments' (the blue shaded are in Figure 2)
- 'Develop and design' (the green shaded area in Figure 2)

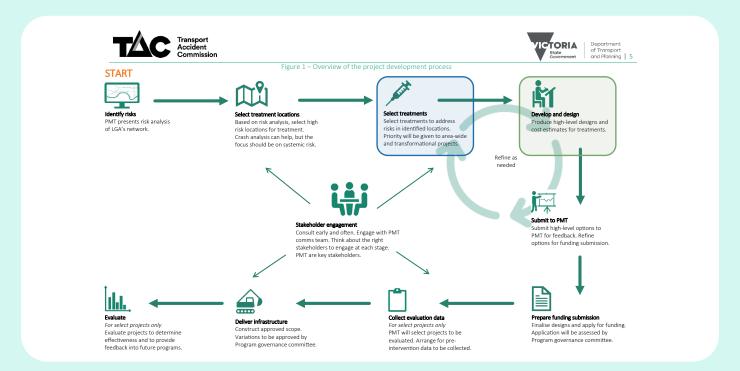


Figure 2 - SLR&S Project Cycle

#### **Real-life Project Proposal**

The City of Greater Bendigo has selected three intersections within Bendigo for improvements. The real-life project sites include three intersections sites being:

- 1. Forest and Mackenzie St intersection
- 2. Rowan and Forest St intersection, and the
- 3. Rowan and View St intersection

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The Competition will focus only on the Rowan and Forest St intersection (Fig 3) and as noted above in Figure 2, the treatment selection and subsequent design such that it aligns with Safe System principles.



Figure 3 - Site Locations

#### **Competition Project Location**

The specific area of focus for the competition is Rowan and Forest St intersection. An aerial view of the intersection is provided in Figure 4 below.



Figure 4 - Competition Project Site, Rowan and Forest St Intersection, Bendigo

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#### **Project Objective**

The City of Greater Bendigo project targets a range of road users with Safe System best practice alignment to the solutions.

#### **Problem Definition**

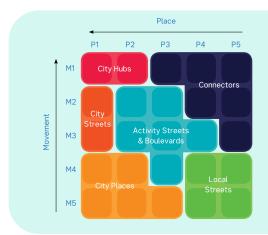
Three intersections in close proximity to each other have been identified for this project which seeks to improve pedestrian safety. The existing streets are 20m wide and provide limited or no opportunities for pedestrian refuge while crossing. The area has a high pedestrian (and traffic) demand, particularly during events and on weekends when people are walking from nearby on-street parking to the visitor precinct around View Street, Rosalind Park and the Queen Elizabeth Oval.

By targeting the most vulnerable road user, pedestrians, the cascading safety benefits also serve a wider range of other roads users.



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#### **Movement and Place**



Understanding where on the Movement and Place matrix a road or street sits is crucial to deciding on the treatments that will be employed to improve road safety. For example, movement corridors prioritise traffic operations and may put more emphasis on separating vulnerable road users from vehicle traffic to maintain efficiency of operation, sometimes through higher operating speeds. Other high movement routes might prioritise the efficient operation of public transport vehicles, particularly trams and buses. On the other hand, pedestrians and cyclists will be prioritised in activity areas, while vehicles will be discouraged from entering. Vehicles that do enter will be required to be driven slowly so that vulnerable road users are protected.

Figure 5 - M&P Classifications

#### The Movement and Place (M&P) Classification has been determined as:

- M3: Moderate movement of people and/or goods on routes connecting municipalities or primary access to Municipal level places
- P2: Place of Regional significance

#### **Description of the Area**

The three target sites are within one block of the View Street visitor precinct which contains shopping, entertainment venues, hospitality, the Bendigo Art Gallery, Rosalind Park and the Queen Elizabeth Oval. It is also close the City Centre and local schools. Pedestrian numbers can reach very high numbers, particularly during events. Traffic numbers are high, particularly on View Street which provides direct access to the City Centre.

#### **Scope Details**

The project cycle per Figure 2 has nine project cycle phases, with stakeholder engagement central to them all. Within these phases the Safe Local Roads and Streets guidelines call for designs. In this real-life project this Competition will focus on the following two phases:

- 'Select treatments' (the blue shaded are in Figure 2)
- 'Develop and design' (the green shaded area in Figure 2)

The next section will require you to answer questions related to treatment selection and your understanding of those treatments in Safe System terms.

# Competition Entry Requirements

#### **Stage One: Submission Questions**

You are required to answer a series of questions. Please download the Future Road Competition Submission template, complete the required fields and upload as a PDF as your Stage One submission. You must answer all questions for your submission to be considered.

#### **Stage Two: Masterclass Presentation**

- Shortlisted teams will be required to prepare a short presentation for evaluation and presenting at the Masterclass.
- The task will be issued to the shortlisted teams after the evaluation of the Stage One submissions



### Resources

All Supporting Reference Material can be accessed via the hyperlinks provided below.

#### **Required Source Materials:**

Module 2 – Safe System objectives for a road transport system:

Part 6: Design that support harm elimination: https://www.roadsafetyeducation.vic.gov.au/ data/assets/powerpoint doc/0010/786178/SS4U Module-2\_Snippet-6\_Design-that-supports-harm-elimination.pptx

Module 3 – Safe System design for a road transport system:

Part 1 Managing Energy on Our Roads: https://www.roadsafetyeducation.vic.gov.au/\_\_data/assets/powerpoint\_doc/0012/786189/ SS4U Module-3 Snippet-1 Managing-energy-on-our-roads.pptx

#### **Supporting Reference Materials:**

- Austroads Towards Safe System Infrastructure: A Compendium of Current Knowledge, Austroads 2018 AP-R560-18 | Austroads
- National Road Safety Strategy <a href="https://www.roadsafety.gov.au">https://www.roadsafety.gov.au</a>
- VicRoads Road Design, Raised Safety Platforms 2019 https://www.vicroads.vic.gov.au/businessand-industry/technical-publications/road-design
- Austroads Understanding and Improving Safe System Intersection Performance, Austroads 2017 https://austroads.com.au/publications/road-design/ap-r556-17
- Austroads Integrating Safe System with Movement and Place for Vulnerable Road Users, Austroads 2020
  - Publication: <a href="https://austroads.com.au/publications/road-safety/ap-r611-20">https://austroads.com.au/publications/road-safety/ap-r611-20</a>
  - Webinar: <a href="https://austroads.com.au/publications/road-safety/web-r611-20">https://austroads.com.au/publications/road-safety/web-r611-20</a>
  - Safe System Solutions Fact Sheets <a href="https://safesystemsolutions.com.au/resources/">https://safesystemsolutions.com.au/resources/</a>