FLOOD MANAGEMENT IN EUROA

ABOUT INLAND RAIL

The Inland Rail project in Victoria is being built to provide sufficient height and width clearance to support the safe running of double-stacked freight trains.

At Euroa there is not enough vertical clearance under the Anderson Street bridge. The two options are to replace the existing bridge with an overpass, a road over the railway, or an underpass, a road under the railway.

The community have previously told us a vehicle underpass is their preferred option. This requires a significantly more complex engineering solution to manage the potential flood impacts and risks.

Additional technical investigations have helped us better understand the challenges of the proposed underpass and the proposed flood mitigations required.

WHAT IS HYDROLOGICAL MODELLING?

Understanding the likelihood and scale of different sized floods occurring is important for managing flood risk.

Hydrological modelling is used to calculate flooding extent based on analysis of long-term flood records and rainfall data, combined with landscape features including ground levels, roads, embankments and river sizes.

There are two types of flooding that could impact an underpass in Euroa:

- riverine flooding from Sevens Creek, where water overflows the banks
- localised storm event, where rainfall generates excessive surface run-off.

By using hydrological modelling, we can calculate the probability of different size floods occurring.

Flood water flows resulting from a riverine flood or a localised storm event behave very differently, so it is important to model both and mitigate each type of flooding appropriately.

CALCULATING THE PROBABILITY

At Euroa we have calculated the likelihood of flooding based on the commonly accepted method, known as the Annual Exceedance Probability (AEP). The AEP is expressed in terms of a percentage of the likelihood of a flood of a given size or larger, occurring in any given year.

A flood with a 1% AEP refers to the level of flooding that has a 1 in 100 likelihood in any one year. A 2% AEP is a smaller flood that has a 1 in 50 likelihood in any one year. To better understand the impacts of flooding with a proposed underpass in Euroa, we have also applied a climate change scenario to the model to calculate the different size floods occurring based on climate change predictions.

At Euroa, the proposed design also takes into account what is known as a freeboard, or an extra height to allow for uncertainties in flooding due to wind and wave activity and other localised hydraulic behaviours.

FLOOD MITIGATION MEASURES

The proposed underpass will be designed to incorporate measures to mitigate both localised storm and riverine flood impacts and associated risks. Mitigation measures will reduce water entering the proposed underpass, manage drainage and ensure back-up safety systems are in place.

Proposed mitigation measures include:

- road crest leading into the underpass on the southern side
- raised earth mounds adjacent to the underpass
- drainage infrastructure beneath Anderson Street
- pumps, stand-by pumps and a sump to divert water into the stormwater system.

Additional safety measures also proposed include:

- anti-trespass fencing of the rail corridor
- throw screens along pedestrian access points and surrounding the underpass
- back-up pumps and generator
- flood warning signs and lights at underpass entries
- provision of boom gates at the entries to the underpass
- CCTV cameras and telemetry systems to monitor conditions.

RIVERINE FLOODING FROM SEVENS CREEK

Initial flood modelling demonstrates there is no difference to vehicle access on Anderson Street, south of the railway with the proposed underpass design, in both a 1% and 2% AEP event.

Historical data indicates the only time on record that a 1% AEP flood has occurred in Euroa was in 1916, when the Sevens Creek peaked at 6.04m. During the recent flooding in November 2022 the Sevens Creek peaked at 5.6m.

The current design provides a road crest on Anderson Street at the southern approach, which prevents water overtopping the crest in excess of a 1% AEP event.

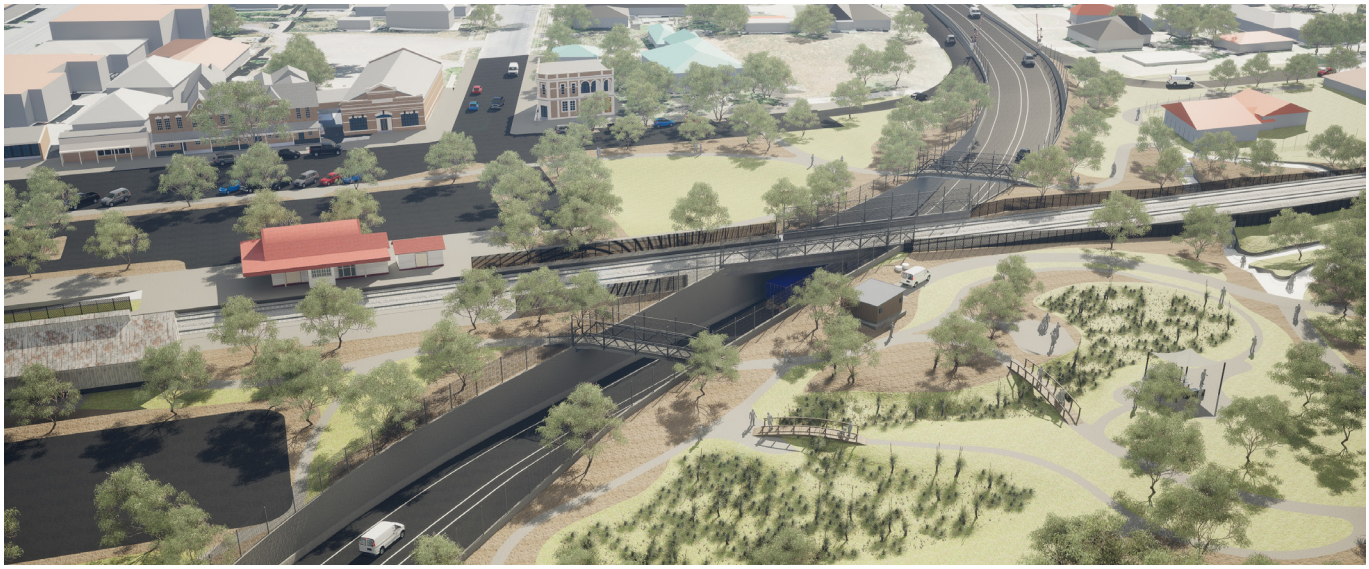
In the very unlikely event flooding from Sevens Creek does enter the proposed underpass, there would be significant flooding throughout all of Euroa, with all roads leading to the underpass flooded to depths unsafe for vehicles. The surrounding flooding would prevent vehicles from using the underpass.

LOCALISED FLOODING FROM A STORM EVENT

Water levels were calculated in the underpass using local rainfall data to determine run-off volume and water depth for a 1% AEP rainfall event, covering storm durations of between 5 minutes and 24 hours.

Without any operational flood mitigation measures, the modelling shows water pooling from surface water run-off in the bottom of the proposed underpass. Should this occur, safety systems including flood warning signs and CCTV and telemetry systems will be used to monitor conditions and prevent entry to the proposed underpass.

The modelling demonstrates with operational pumps and sump, the proposed underpass design will be safe to use in a 1% AEP rainfall event.



Visualisation looking south towards Railway Street over the Anderson Street proposed road underpass

Visualisation of the Anderson Street proposed road underpass showing the flood and safety mitigations required at the southern entry

WANT TO KNOW MORE?

ARTC is committed to working with communities and landowners, state and local government as a vital part of our planning and consultation work, and we value your input. If you have any questions or comments, please let us know.

1800 732 761 **victoriaprojects@artc.com.au** **inlandrail.com.au/t2a**

CURRENT AS AT FEBRUARY 2023

IR_400507