QUEENSLAND COURTS

CORONERS COURT OF QUEENSLAND

FINDINGS OF INVESTIGATION

CITATION:	**Non-inquest findings into the death of Pedro Miguel Ventura Enes**
TITLE OF COURT:	Coroners Court
JURISDICTION:	BRISBANE
DATE:	24 February 2026
FILE NO(s):	2025/614
FINDINGS OF:	Carol Lee, Coroner
CATCHWORDS:	Coroners: Heavy Vehicles; Dual Tyres; High Velocity Rock Projectile into Windscreen; Regulatory Oversight; Industry Wide Risk Mitigation

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Introduction

Pedro Miguel Ventura Enes (Pedro) was born in Portugal on 16 May 1970 and died on 5 February 2025 at the Royal Brisbane and Women's Hospital (RBWH).

Queensland Police Service (Police) reported Pedro's death to the coroner because his death appeared to be a violent or unnatural death and fell within the definition of a reportable death in the *Coroners Act 2003* (CA).

The role of a coroner is to investigate reportable deaths to establish, if possible, the cause of death and how the person died. The purpose of a coronial investigation is to establish facts, not to cast blame or determine criminal or civil liability.

Circumstances

Pedro was a 54-year-old Portuguese man who was in Australia on holiday with his spouse.

At approximately 05:30 hours on Monday 3 February 2025, Pedro and his spouse departed the Sofitel in Noosa Heads, heading towards Hervey Bay intending to board a ferry at River Heads to join a tour at K'gari[1]. He was driving a 2023 Blue Volkswagen T-Cross bearing Qld registration 065IA5. They stopped at a petrol station to refuel and continued their journey along the Bruce Highway.

At around 06:40 hours, Pedro followed behind a heavy vehicle Northbound until overtaking it in the right-hand overtaking lane between Kanyon Road and Gootchie Road at Glenwood. Shortly after merging back into a single lane, a rock penetrated the windshield and struck Pedro in the face and neck causing instant loss of consciousness and serious injuries.

In order to maintain control of the vehicle, Pedro's spouse seized the steering wheel and pulled his leg off the accelerator, manoeuvring the vehicle into the western side guard rail to a stop. She exited the vehicle from the rear passenger side door and commenced first aid on Pedro. She also waved down passing motorists for assistance.

Police, Queensland Ambulance Service and the Queensland Fire and Rescue Service arrived shortly after. Care Flight evacuated Pedro to the RBWH in Brisbane for ongoing care.

At RBWH, Pedro was diagnosed with severe traumatic brain injury with massive facial trauma:

1. Complex head and facial fractures.
2. Extensive, severe comminuted left frontal bone fracture with multiple displaced cutaneous fragments and pseudo-meningoencephalocele.
3. Complex facial bone fractures with left craniofacial disruption.
4. Left maxillary displacement - anterior and inferior.
5. Base of skull fracture.
6. Multiple intraparenchymal, subarachnoid, subdural, and intraventricular haemorrhages.
7. Irregularities of the bilateral intracranial internal carotid arteries, at fracture sites, reflect nonocclusive dissections/mural vascular injury.
8. Complete left global rupture.
9. No cervical spine fractures.

[1] Formerly known as Fraser Island.

Surgical intervention was not recommended by the neurosurgical team as the injuries were considered unsurvivable. Comfort care measures were provided until he was declared life extinct on 5 February 2025, after three days in hospital.

Forensic Pathologist's Examination

An external examination, imaging, document review and toxicology studies were undertaken.

The opinion of the forensic pathologist as to the cause of death is based on consideration of the circumstances of death and a post-mortem examination including associated imaging and testing.

The forensic pathologist summarised the findings at examination as follows:

1. A postmortem computed tomography (CT) scan was performed before the examination. The images are in keeping with antemortem images. No other significant findings were noted.
2. External examination showed features of therapeutic intervention. Bilateral periorbital haematomas were present. The globe of the left eye was ruptured. Sutured wounds of the top of the right head over the parietal region, left forehead, and left side of the face were present. There was a contusion of the mucosal surface of the right lower lip. No other significant injuries or evidence of disease were noted.
3. Antemortem blood from hospital was requested for toxicological analysis. Post-mortem femoral blood, subclavian/central blood, and vitreous humour (eye fluid) were also taken for toxicological analysis.

In the opinion of the forensic pathologist, the cause of death was:

1(a) Blunt force head injury*, due to or as a consequence of*
1(b) Hit by rock while driving.

Toxicology

Toxicological analysis was undertaken on samples taken on an antemortem and postmortem basis, yielding the following results:

1. Ante-mortem Blood[2]

   Alcohol- Not detected (less than 10 mg/100mL)
   Midazolam- 0.02 mg/L
   Ketamine- 0.25 mg/L
   Norketamine- Approx. 0.2 mg/L
   Ondansetron- 0.03 mg/L
   No other drugs detected

2. Vitreous Humour

   Alcohol- Not detected (less than 10 mg/100mL).

[2] Taken at 10:15 hours on 3 February 2025.

Investigation

A. Forensic Crash Unit

Following a Police investigation involving the Forensic Crash Unit (FCU), the investigating FCU officer provided an opinion on the circumstances and cause of the incident, the majority of which I accept; relevant aspects of which are summarised as follows:

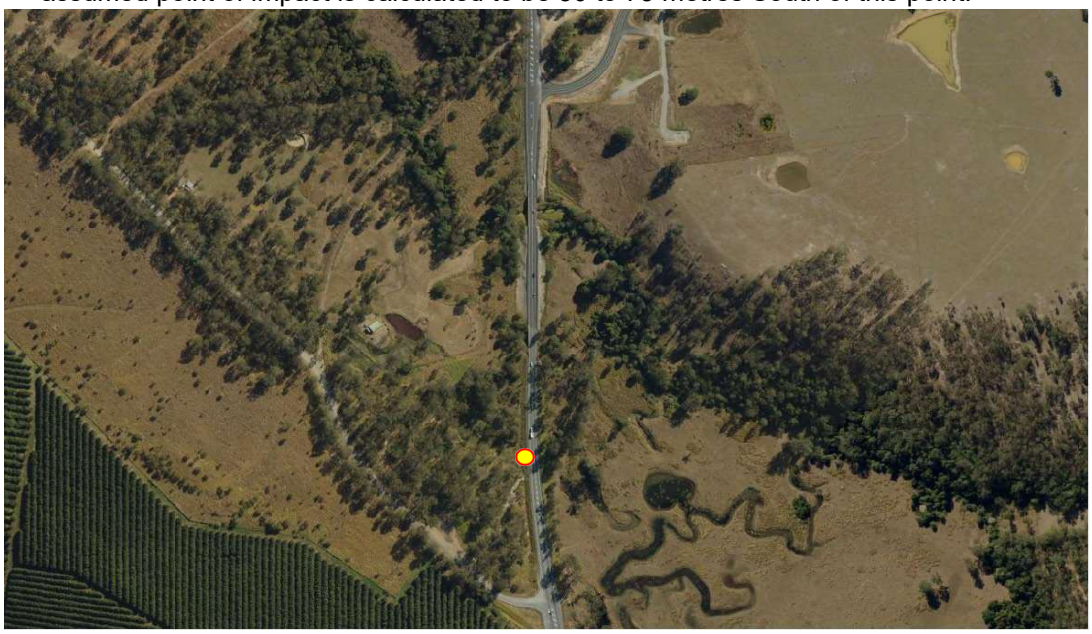
Units Involved

1. Unit 2 (Pedro's vehicle) was an AVIS rental car, a blue 2023 Volkswagen T-Cross hatch bearing Queensland registration 065IA5. The front driver's seat was occupied by Pedro, with the front passenger seat occupied by his spouse, Mrs Belinda Enes. There were no rear passengers.

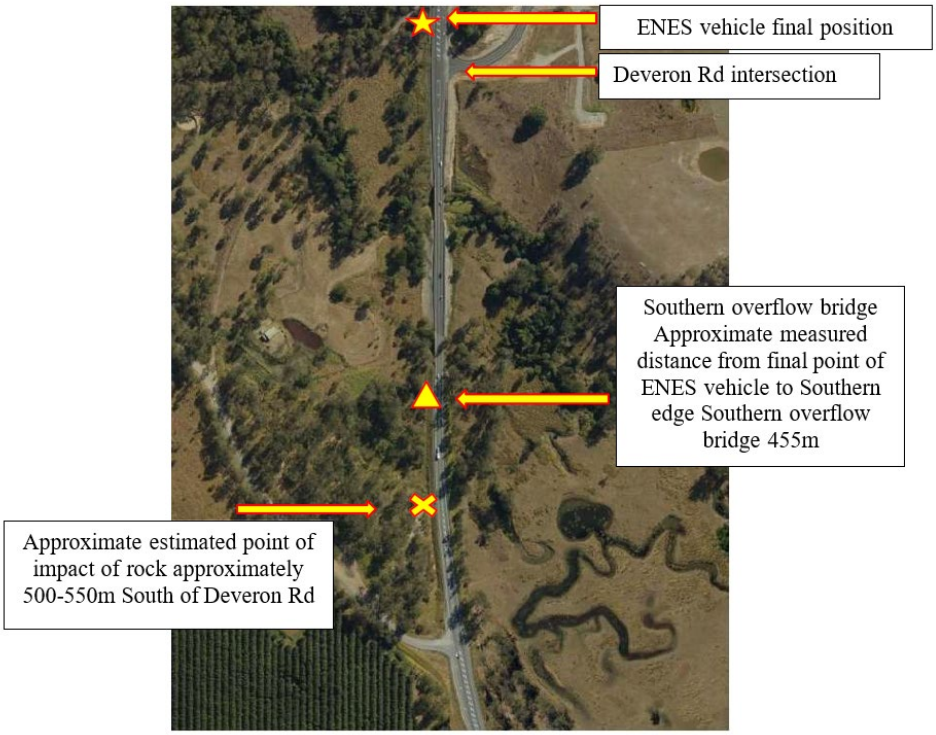
2. Unit 1 was a black and orange 1990 DAF 3600 single cab truck with a tipper style flatbed ('truck'). On the date of the incident the truck had nil tail gate attached and was carrying a small turquoise coloured excavator. The truck is registered to an earthmoving business at Glenwood, and the driver was the owner/operator on the date of incident. The truck is a 2x4x4 set up which means it consists of one front steering tyre on each side of the cab, with two rear axles both containing a set of double tyres on each side. The drive axle is the foremost of the rear axles, with the last axle being the slave axle.

Scene Examination

3. The scene covers an extensive distance, with Unit 2 approximately 50 to 60 metres North of Deveron Road against the guard rail (-25.883813, 152.596958). The entire site extends approximately 550 metres South of Deveron Road to immediately North of the merge of the Northern overtaking lane where the Southern end of the Southern Gootchie overflow bridge is located (-25.888415, 152.596988), which is where the first trace evidence was located. The assumed point of impact is calculated to be 50 to 75 metres South of this point.



Aerial view of estimated point of impact and crash location Bruce Highway



Crash scene overview

4. The site is a straight stretch of relatively new sealed bitumen surface in good condition with no apparent physical damage, defects or obstructions to the surface that would contribute to this incident. The road is a single lane in either direction approximately 3.5 metres wide with a painted double centre line separating.
5. A solid continuous fog line exists between 30-100cm from the edge of sealed surface or raised Armco railing. The Armco railing is continuous except for bridge sections where it becomes a solid poured concrete barrier post with an elevated steel horizontal railing slightly higher than the Armco rail.

Vehicle against guard rail

6. Race contact from the left side of the vehicle in the form of blue paint from the vehicle's body and grey plastic from the wheel arch and side skirts was observed intermittently for approximately 340 metres along the Armco and bridge railings.
7. Circular rubber tyre transfer impact scrapes were observed on the lower rail with a heavy paint transfer on the upper rail indicative of a primary point of contact / impact at speed.

Guard rails close up paint and rubber impact transfer

Damage to Unit 2 vehicle left hand side

8. Several small markings were observed in the Northbound Lane however these were determined to be historic paint spills and not markings related with the accident. Nil markings were observed at all on the Southbound Lane for the entirety of the scene despite an extensive search.
9. The road was slightly wet after recent rain and is a reasonably new surface that any scrapes, gouges or suspect markings would easily have been visible.

View North of T-Cross on Bruce Highway Oaky Creek

10. It is possible that any minimal trace evidence of contact between the rock and road had potentially been lost due to the rains that morning and the sheer volume of heavy and light vehicles travelling through the area at the time of incident.
11. There were no overpasses or cut slopes for the rock to have fallen from or been thrown from.

T-Cross against guard rail looking Northbound Bruce Highway from Deveron Road intersection

Northbound Bruce Highway from Northern overflow bridge concrete rail

Vehicle Examination

Unit 2

12. Scrapes and gouges consistent with extensive contact with the roadside railings were observed on the left side of the vehicle at heights consistent with the railings. The directionality is consistent with the vehicle's left side dragging along the railings in a forward motion as the vehicle came to rest.
13. The vehicle's front left tyre had deflated and there was damage to the front left fender and wheel rim consistent with a substantive impact of minimal angle in nature, at speed with the lower vertical section of the guard rail.

T-Cross damaged front left wheel and transfer from guard rail left side

14. The windshield of Unit 2 was observed to have a large, depressed fracture directly in line with the driver's seat and steering wheel between 20 to 60 centimetres from the base of the windshield. The depression exhibited a radial fracture from a low centre point, about 15 centimetres above where a 20 centimetres long vertical and 10 centimetres wide void is observed with glass curling inward, indicative of a significant mass entering through the glass at speed.
15. Gouge marks are observed on the raised portion of dash directly in front of the steering wheel. The gouges continue in line onto the steering wheel.

External front view of windscreen gouges visible on dash

Internal view of windscreen

16. The interior of the vehicle exhibited considerable spread of body matter throughout the vehicle, with the largest concentrations being observed around the centre console, driver's seat, steering wheel, dash and ceiling areas.
17. Dispersal spray observed on the ceiling is consistent with a traumatic blow from an object to the left side of Pedro's head moving at speed front to rear of the vehicle in line with the observed movement of the rock and observed transfer in the vehicle.

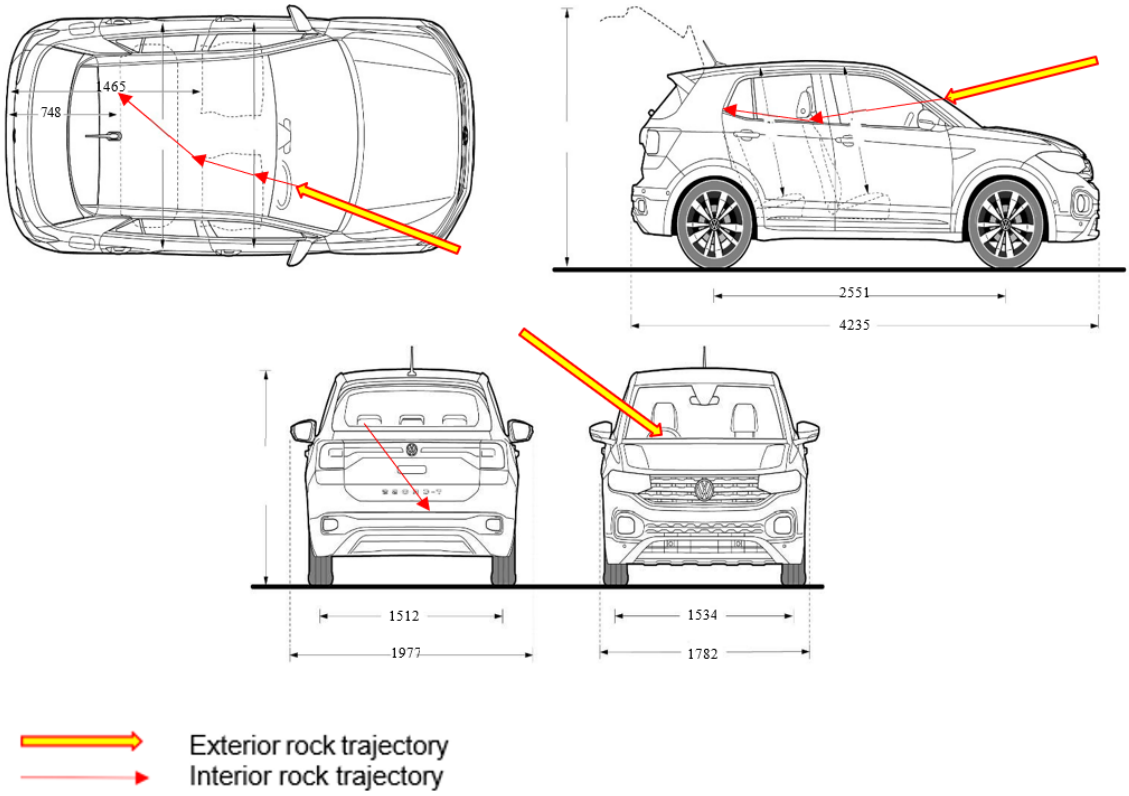
18. The dispersal pattern was indicative of an impact with the left side of Pedro around head height, accounting for seat position and the approximated size of Pedro whilst seated.
19. There was transfer on the left upper shoulder backrest area of the driver's seat consistent with the rock glancing off the upholstery.
20. There was further transfer on the rear passenger seat headrest consistent with the rock striking the headrest (causing it to raise in height from the lowered position) before the rock bounced forward and came to rest near the centre of the floor well behind the driver's seat.

Image of front driver & passenger seat

Image of rear seat

Image of rear seat head rests and parcel shelf

Image of rear seats



21. Based on a known approximate speed of Unit 2 provided by a witness of 95-100kmh and an assumed speed of Unit 1 of approximately 60 to 100 kilometres per hour based on the driver's estimation of the truck's acceleration capacity, the estimated impact force of the rock on the windshield of the Volkswagen would be in a range of 3,500 Newtons & 11,500 Newtons (minimum & maximum).

Image of 1990 DAF 3600 Prime mover truck with hydraulic tip tray (Unit 1)

Mechanical Inspection

Unit 2

22. A forensic mechanical inspection was undertaken on 5 February 2025 at Claytons Towing, Gympie. The vehicle was determined to be in in a satisfactory mechanical condition at the time of inspection.

Unit 1

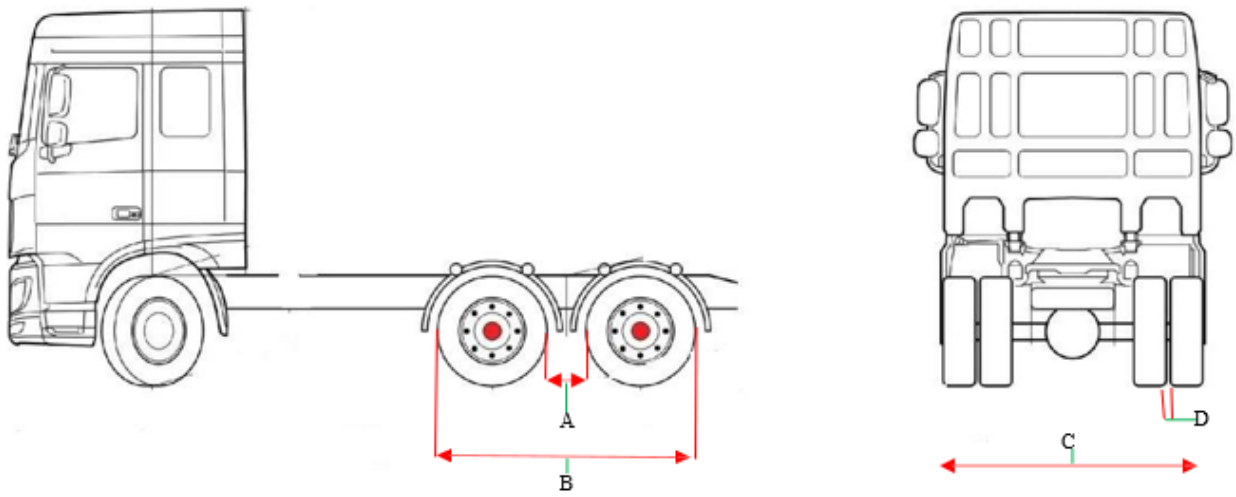
23. Officers attended the property at Glenwood on Tuesday 18 March 2025 and obtained video and photographic measurements. It was observed that Deveron Road and the driveway into the truck storage location were unsealed dirt roads with many stones or varying sizes seen on the sides of the road. Furthermore, other trucks used in similar load carrying were observed using the road.
24. A visual inspection was conducted on the truck in situ. General wear and tear was observed as expected in a vehicle of this age and type.
25. There was no evidence observed of rock strikes or indications of damage to the tyres, undercarriage or frame of the vehicle.
26. There was no significant damage observed between the tyre walls, although some evidence of transfer was present on opposite inner sides between the duals indicating that foreign/organic matter had been between the tyres.
27. The spacing between the tyre walls of the duals was measured consistently at approximately 100 millimetres.
28. Tyres were standard HIFLY 295/80 HH308 11R22.5.

Spacings consistent between dual tyres on the drive and slave axles RHS

29. The tyres appeared in reasonably good condition for a work truck. Mud guards were fitted and undamaged on the rear of the slave axle, with wheel guards present on all wheel arches. The truck has minor cosmetic damage in multiple areas including the wheel arches, however these appear to be historic, with nil physical evidence at the scene to suggest the damage occurred on the date of incident (no plastics or other related materials or debris observed at scene).
30. Damage was observed to the rear right slave axle wheel arches rim, and a slight deformation to the drive axle wheel guard on the driver's side at the rear of the arch. The owner was of the

opinion this was historic damage and not recent. No plastic or other fragments were found anywhere at the scene to indicate the damage occurred on the date of incident.

TRUCK MEASUREMENTS



A: 30cm depending on tread wear

B: 2380cm outer tread front tyre diameter to outer tread rear tyre diameter

C: 2380cm outer tyre wall outer tyre to outer tyre wall outer tyre

D: 10cm dual tyre spacing

Rear RHS slave axle wheel guard spacing height from tyre (+/-90mm)

Rear RHS drive axle wheel guard spacing height from tyre (+/-90mm)

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AMOUNT DUE FOR PAYMENT UPON
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30/01/25	TAMARA	

VEHICLE MAKE	VEHICLE SERIES	YEAR	ODOMETER	CUSTOMER ORDER NO.
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VEHICLE MODEL	REGISTRATION NO.	VIN NO.	PAID BY	
TRUCK	[redacted]			

Product	Description	Qty	Price	Amount
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RECOMMEND REPLACING STEERS AS SHOWING SIGNS OF AGE

[redacted]

NOTE YOUR TYRES HAVE BEEN CHANGED AND WHEEL NUTS TORQUED TO SPEC. PLEASE RECHECK AFTER 100 KMS

EX GST AMOUNT	$536.36
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Receipt for rear right outer slave axle tyre replacement by Gympie Bridgestone conducted on 30 January 2025. (Original document sighted).

Additional Investigations

Interviews

31. Various persons were interviewed by Police, relevantly including the following:

a. Mrs Enes
- Seated in the front passenger seat.
- Briefly saw a rock come from above before Pedro was struck.
- Reached over and took control of the steering wheel. Then pulled Pedro's leg off the accelerator and kept the car up against the railing until it slowed and stopped.

b. Driver of the heavy vehicle travelling Northbound
- Was travelling 90 to 95 kilometres per hour when a blue hatch almost hesitantly overtook him in the overtaking lane, and he had to slow down a bit to let it past as the left lane finished and the two lanes merged again. The blue hatch wasn't speeding, it was just doing the speed limit and maintained that speed after merging back in.

- Was around 100 to 150 metres behind the blue hatch and saw a dark coloured tipper truck coming towards them in the Southbound lane. Saw a rock come out from between the rear axles of the oncoming truck and headed directly for the windshield of the oncoming blue hatch.
- Saw the hatch momentarily appear to struggle to correct itself in the lane before pulling over into the guard rail and slowing down.
- Notified other heavy vehicles behind him of the hazard, however he was unable to safely stop, and he thought that the Clayton's tow truck behind him had stopped to give assistance.

c. Queensland Health truck driver
   - Was driving a Queensland Health truck Southbound and saw a blue hatch driving along the guard rail just South of Deveron Road intersection.
   - Caught up to and saw a dark coloured tipper with an excavator on the back which had no rear tail gate and it turned into Arborten Road at United Fuels at Glenwood.
   - Was too far behind the tipper to see what happened to the blue hatch.

d. Owner/Driver of Unit 1
   - Had driver's side rear outer slave outer tyre replaced four days prior to incident (30 January 2025)[3], no indication of rock in duals on the drive axle given by the tyre fitter.
   - Left home for work and got fuel, entered the highway and accelerated up to 100kmh.
   - Went to Glenwood service station.
   - Nil knowledge of incident until notified by news. Did not believe himself or his vehicle to be involved.

CCTV Analysis

32. CCTV and dash camera analysis allowed tracking of Pedro's vehicle from Gunalda to the moments immediately after impact in the vicinity of Deveron Road, where Unit 1 was identified from dash camera and CCTV from Glenwood United Petroleum service station footage.
33. CCTV allowed the identification of the truck, which led to identification of the driver and sole witness to the incident, being the driver of the truck, whom Pedro overtook.
34. Although the side and dash cam of the Queensland Health truck and Glenwood CCTV was insufficient to provide a registration, enquiries of the distinctive paint job & excavator revealed the identity of Unit 1 as an earthmoving business (google search showed Unit 1 in the company internet advertising).
35. Below is a timeline of the journey of Unit 2 up to immediately post impact, and the subsequent identification of Unit 1.

[3] See above invoice.

Bruce Highway North bound Gunalda Roadhouse Vellex HV 06:29 hours

Bruce Highway North bound Gunalda Roadhouse Volkswagen T- Cross 06:29 hours

Bruce Highway North bound T-Cross behind Vellex HV Kanigan 06:34 hours

Highway Glenwood T-Cross behind Vellex HV Arborten Road (time stamp 8-9 mins slow 06:37 hours)

Queensland Health Truck dash cam passing T-Cross on railing Deveron Road 06:41hours

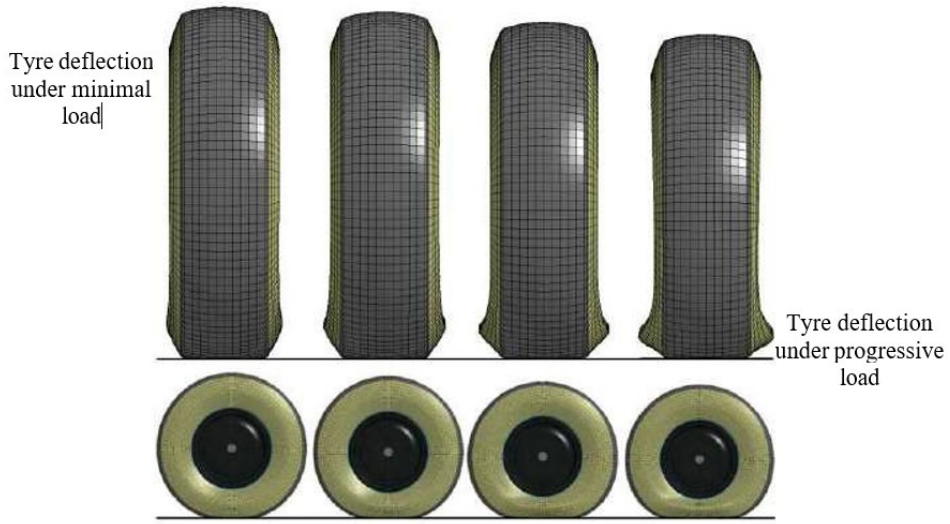
Queensland Health Truck passing Vellex HV 06:41 hours

Queensland Health Truck Passing Unit 1

Glenwood approx. 06:45 hours

Tyre Analysis

36. The DAF features standard tyre size and standard tyre gap in the duals for this type of vehicle. Bridgestone Tyre Centre Gympie was contacted regarding the replacement tyre fitted on 30 January 2025. The manager and experienced tyre fitter assisted investigators by providing information.
37. The manager/tyre fitter stated that in their line of work they regularly encounter instances of rocks stuck within dual tyres on trucks. He stated this was most prevalent on quarry trucks and logging trucks, with a frequency of about once or twice a month, 'give or take'. He brought to light the most recent example from the previous month where a truck experienced a 'puncture' which upon investigation by his staff was actually found to be a rock wedged between the duals wearing a hole in the inner tyre walls.
38. Standard practice when they locate a rock wedged in the duals is then to loosen the wheel nuts to manoeuvre the wheel and increase the spacing of the duals and allow the rock to fall out.
39. If a truck driver located a rock in the duals in the field, they would attempt to extract the rock using a snatch strap or similar which could risk doing further damage to the inner tyre walls.
40. He stated that when performing a tyre change, it is standard practice to check all other tyres for condition etc, which is why on the invoice provided to the truck owner it was noted that the front steers were recommended to be replaced due to showing signs of age.
41. He stated that in his opinion as an experienced truck tyre fitter, elements such as the rain, the cold tyre pressure increasing from the truck accelerating, and the amount of tyre deflection (the amount of 'bulge' the tyre lowers under load as the weight or torque is applied to the tyre by the equipment axle) present from the load being carried by the truck could all have contributed to the rock being dislodged in the circumstances present on the morning of the incident.



Tire deflection from the beginning of the test to maximum deformation presented in two views: one from the side of the tire and second from the rim surface side

Tyre deflection of Unit 1 rear tyres under load immediately after incident

Examples of large rocks of similar size wedged in dual truck tyres

Rock Analysis

Images showing powdered glass from impact, and rubber friction burns on either side of the wedge shaped rock from its assumed orientation during its position lodged between the dual tyres.

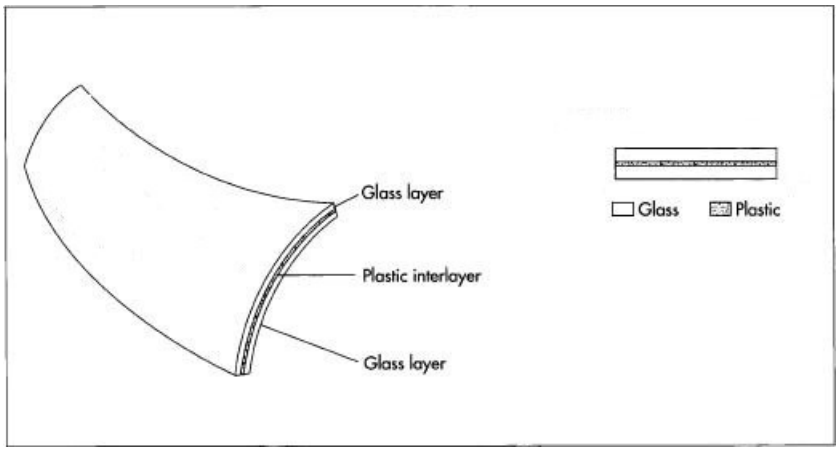
42. The rock was recovered at the scene in the rear of Unit 2. It measured approximately 190mm long, 160mm wide and 100mm tall. There is evidence of rubber deposits on two opposing flat faces consistent with being wedged in the 100-millimetre gap between the dual tyres on the truck.
43. The rock was photographically identified by an academic specialist in the fields of earth sciences, geochronology, geochemistry and geochemical modelling from the Queensland University of Technology as a plutonic igneous rock believed to be a rock called gabbro or a similar rock called diorite.
44. Gabbro contains mainly pyroxene and plagioclase minerals. The only difference between it and diorite is the proportion of the light minerals (plagioclase) and dark minerals (pyroxenes). Both rocks are very similar and have a composition similar to, but even denser than regular granite and are found commonly in the Queensland granite belt.

Windshield Analysis

45. Enquiries were made into the occurrence of any similar incidents, for the purpose of studying and comparing damage sustained by the windshield. It was observed that damage to the windscreen of a stationary vehicle exhibited different characteristics than that of a moving car. An incident that occurred in the Northern Territory (NT) in 2012 and resulted in a Coronial Inquest into the death of Rosalyn O'Neill[4] was identified as a potential matter for windshield damage comparison.

[4] Inquest into the death of Rosalyn O'Neill [2012] NTMC 028.

46. Australian Standards regarding automotive windscreens or windshields stipulate that vehicles use laminated glass. This is two or more layers of glass tempered glass with a plastic layer often made of PVB (polyvinyl butyral) bonded between.
47. In both cases (i.e. O'Neill and Enes), it is possible to see that the safety glass appeared to act consistently with the expectations of established design and Australian standards. In both cases, the glass did not shatter and disperse a multitude of free fragments upon the occupants, but rather the safety laminate maintained the overall structure of the windshield after the initial impact.
48. Tragically in both instances however, it can also be seen that once the laminate is fragmented sufficiently from the initial impact, the overall strength of the glass is insufficient to stop the object under its own continuing velocity or in combination with the forward motion of the vehicle, from penetrating the large area of compromised integrity.
49. This may be due to a combination of circumstances, however, is most likely to be attributed to the size and mass of the rocks involved and the resultant impact force which is exerted when they strike the glass.



Similarities with the NT case

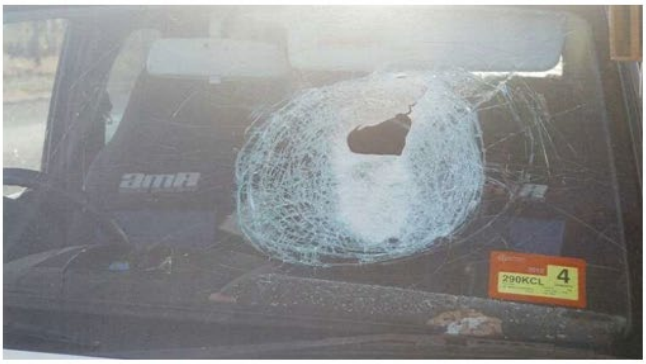
50. From the outset, it was apparent that the manner of Pedro's death was extremely rare in occurrence, with only a handful of events similar identified worldwide in recent years. The most salient and informative of these was the 2012 O'Neill Inquest in the NT.
51. The granite rock in that matter had likely been deposited on the road after being ejected from the duals of a heavy vehicle. The rock was then run over by a vehicle and 'flicked up' into the path of the vehicle which contained Mrs O'Neill, who was seated in the front passenger seat.
52. The damage to the windshield shows great similarities to Pedro's vehicle, with an initial area of impact, and a penetration above within the fracture area showing the glass 'tearing' inwards in the shape of the rock profile as is observed in Pedro's case.
53. The O'Neill rock displayed similar characteristics including the presence of dark rubber transfer on opposing sides of the irregularly 'wedged' shaped object which was determined to be consistent with being lodged between the dual tyres before being deposited at the location.

Enes and O'Neill rock and windshield penetration comparison

Enes rock

O'Neill rock

Enes T-Cross front windscreen strike



O'Neill vehicle front windscreen strike

Enes T-Cross front windscreen penetration

O'Neill vehicle windscreen penetration

54. In the above images, it is possible to see the O'Neill rock continuing through to the rear of the cab where without contact with any further objects to reduce its speed before striking the back wall causing further damage. Radial fractures of almost identical size and form spread from the initial point of impact in both instances, with the rocks penetrating through the delaminated glass surface slightly above the impact point, consistent with a vehicle moving forward at speeds of 80-100 kilometres per hour.

Preliminary Opinion on Cause of Incident

55. Following consideration and assessment of the available information, the investigating FCU officer provided the following conclusions and opinion:

    a. The scene evidence indicates that a 3.8kg rock entered the front windshield of Unit 2, made contact with the dash and steering wheel prior to striking Pedro, causing catastrophic injuries resulting in his death.
    b. Observations at the scene in association with the testimony of a witness supports that Unit 1 had left the home address of the registered owner/driver, has then continued and turned left onto the Bruce Highway, then accelerated up to road speed of 90 to 100 kilometres per hour with the rock wedged between the driver's side dual tyres on the drive axle.
    c. At some point before Unit 1 reached a distance of approximately 500-550m South of the intersection at a speed of between 60 to 80 kilometres per hour, the rock has been expelled at an unknown velocity, potentially either bouncing off the bitumen or being flung into and ricocheting off the tyres of the slave axle, and subsequently being ejected in a sideways and forwards trajectory directly into the path of the oncoming Unit 2.
    d. Due to the circumstances of the weather and the speeds involved, there would be very little opportunity for the driver to visually detect the oncoming hazard and then to take evasive action.
    e. From witness testimonies, it is apparent from the lack of any attempt to slow or alter the vehicle's position in the lane, that Pedro did not see the rock in flight and was most likely completely unaware of the danger until the moment of, or just prior to the moment of impact.
    f. The CCTV images taken by the Queensland Health truck and United service station as Unit 1 turned into Arborten Road indicate that despite the lack of tailgate present at the time while it transported the excavator, there were mudguard and wheel arch guards present covering the top and rear of the rear dual wheels consistent with legislation. The wheel guards were observed however to have existing minor damage.
    g. It is the opinion of the investigating FCU officer that with the rain providing a reduction of friction as the inner tyre walls became wet, the tyre walls expanded slightly under increasing pressure as the tyres began to warm, the rock has been dislodged from its position where it was most likely wedged between the driver's side dual drive axle tyres as Unit 1 accelerated onto the highway.
    h. Due to the increasing tyre pressure and declining friction from the wet weather, the rock was dislodged and ricocheted in an unknown manner causing it to be ejected out into the path of Unit 2.
    i. A search for similar incidents indicated that incidents such as the one resulting in Pedro's death are both extremely rare and extremely dangerous. The NT inquest was identified as a potential comparison, with the exception that the rock involved seemed to have been bounced up by the undercarriage of a preceding vehicle as opposed to being flung at speed into an oncoming vehicle[5].
    j. The lack of documented incidents of this nature emphasises how unique the circumstances are for an incident such as this to occur.
    k. The available evidence when viewed in context and compared with previous similar incidents indicates the investigator's proposed sequence of events as the most plausible explanation for the tragedy that unfolded that morning.

56. In terms of charges under consideration, the investigating FCU officer opined as follows:

[5] The two coronial recommendations arising out of that Inquest related solely to risk mitigation pertaining to the carrying of loads from quarries, which is not applicable in this case.

a. There presently is no legislation that covers debris ejected from the dual tyres of a heavy vehicle. *Transport Operations (Road Use Management—Vehicle Standards and Safety) Regulation 2021 s44* regulates the securing of loads, however this incident does not fit the legislation for an insecure load under standard TORUMS Light vehicle or Heavy vehicle Acts.
b. There currently does not exist any legislative requirement for the driver of Unit 1 to inspect their vehicle prior to operation for any potential projectiles lodged in the dual tyres of the vehicle.
c. As described by experienced truck tyre fitter and as experienced by FCU investigators whilst inspecting Unit 1, it is not always possible to conduct a comprehensive inspection in the field due to environmental issues (terrain, weather, etc), line of sight with obstructions in the body of the vehicle or the wheels themselves preventing a complete inspection of the entire circumference.

57. In relation to any issues identified, the investigating FCU officer opined as follows:
    a. Attempts to find any code of practice regarding rocks stuck in dual tyres could only locate references to standard operational practices (SOPs) used in some quarry mining or freight operations where drivers utilising vehicles with dual tyres were either required or expected to conduct visual inspections and remove any objects from within the duals prior to commencing transport.
    b. If the owner/driver of Unit 1 had followed such a procedure then it is possible that Pedro would still be alive today, however legislating this procedure would be unfeasible as every set of dual tyres on every trip would need to be inspected and verified at each start point on the trip, factoring in required fatigue management and operationally required stops.
    c. Additionally, the laminated windshield of Unit 2 complies with established current Australian standards and appeared to protect the occupants of the vehicle from the initial impact despite the significant size and force of the rock strike, however the area of damage spreading from the impact was incapable of maintaining sufficient structural integrity to then divert the rock up and over the vehicle.
58. As a result of the investigation, the following recommendations were made by the FCU investigating officer:
    a. It is only through a combination of improvements of design to both light and heavy vehicles, in combination with improving accountability for operating procedures of heavy vehicles, can the inherent risk of rocks being thrown from earthmoving or forestry type trucks into light traffic be minimised or eliminated.
    b. It is a certainty that if Unit 1 had identified the presence of and removed the rock prior to entering the highway, the incident would not have occurred.
    c. With earthmoving and transport trucks not regulated or legislatively required to perform checks, the only incentive to do so falls into the realm of cost saving or Occupational Health and Safety such is observed on some quarry sites where truck dual tyre checks are procedure.
    d. Legislation exists for drivers and companies to provide liability for the loads they carry in terms of dimensions, mass and how they are secured. There does not currently appear to be any legislative requirement for drivers / operators to ensure their dual tyres are free of obstructions or objects that have the capacity to become projectiles.
    e. Improvements in the design of some newer prime movers and heavy vehicles has progressed to incorporate physical measures to reduce water and dust spray being ejected from the wheel arches.
    f. Retrofitting these protective design measures to existing older earthmoving and forestry type trucks currently in the workforce would be beneficial to the safety of other motorists, however it is not known how effective these measures would be with a rock of the size and proportions in this matter.

g. The joining of wheel arch guards and/or reducing the space between the, and fitting heavy duty mud guards behind all wheels, however, would at face value reduce the probability of a stone being ejected from between the axles such as occurred in this instance.
h. Unit 2 complied with current Australian standards for light vehicle windshield safety, however the glass only protected the occupants of the vehicle from the initial impact.
i. Once the laminate was significantly damaged, the rock was able to pierce the damaged section above the initial strike point due to the vehicle's own continued momentum acting against that of the rock.
j. Potentially, if the laminate was reinforced, the structure of the damaged (delaminated and fractured) section of glass may be capable of diverting such a significantly large rock from continuing its path towards the occupants within the vehicle.
k. Although incidents like this one and that of the prior NT case referenced above are very uncommon, they are not unheard of. It is in the interests of public safety to investigate any potential options in providing additional physical and legislative protections to motorists through continued development of vehicle safety and safe operating standards and procedures.
l. Additionally, the investigation into this incident has highlighted the benefits of CCTV, both in static fixed positions and particularly on vehicles.
m. It is believed it would be greatly beneficial to public and motorist safety if all heavy vehicles were legally required to be fitted with high quality dash cameras in addition to side and rear cameras, such as were fitted to Queensland Health trucks which provided invaluable evidence in this investigation.
n. If the truck that Pedro overtook had such a camera installed, the incident would have been captured in its entirety, and any potentially unresolved questions could be answered for the Coroner or Pedro's family.
o. If these cameras were mandated and rendered tamper proof, they could be a valuable asset in holding drivers and companies accountable either legally or civilly for accidents or incidents involving items stuck in dual wheels of or falling from heavy vehicles. accidents or incidents involving items stuck in dual wheels of or falling from heavy vehicles.

New model trailer with closed type wheel arch gap

Side view example of new model prime mover fitted with extended mud flaps on both axles, sturdier metal wheel arch guards, heavy duty rubber joiner, and side spray brushes

Side view from front angle

Side view from rear angle

p. It is recommended that fitting design improvements like these above (pictured on new model trucks) to older vehicles in use, would reduce the probability of any similar rock or projectile related accident resulting in the unnecessary and tragic loss of life occurring again.

B. NHVR

The National Heavy Vehicle Regulator (NHVR) was asked for information regarding the issues raised by the FCU.

The NHVR operates under the Heavy Vehicle National Law (HVNL) which is a national scheme for facilitating and regulating the use of heavy vehicles on roads in a way that promotes public safety; manages the impact of heavy vehicles on the environment, road infrastructure and public amenity; promotes industry productivity and efficiency in the road transport of goods and passengers by heavy vehicles; and encourages and promotes productive, efficient, innovative and safe business practices. Safety of road users and the wider community is an objective of the NHVR in relation to the use of heavy vehicles and the risks they pose.

A summary of the NHVR response appears as follows:

1. The NHVR is aware of the risk of debris becoming stuck between dual tyres on heavy vehicles.
2. As to what action the NHVR is taking to mitigate the risk, including consideration of changes to legislation and other policy measures, the actions NHVR has taken/is taking to mitigate the risk within the current legislative framework, as it relates to existing vehicles:
    a. Background:
        - Across Australia, standards for Heavy Vehicles are set by the Department of Infrastructure, Transport, Regional Development, Communications, Sports and the Arts and are issued as the Australian Design Rules (ADRs) pursuant to the *Road Vehicle Standards Act 2018* (Commonwealth).
        - The *Heavy Vehicle (Vehicle Standards) National Regulation* (Regulation) prescribes vehicle standards for a single heavy vehicle or heavy combination in jurisdictions that have enacted the HVNL. Schedule 1 of the Regulation provides that Heavy Vehicles must be compliant with the ADRs. Other vehicle standards are set out in Schedules 2 and 3.
        - The NHVR enforces the HVNL and the Regulation and is the responsible agency for ensuring ongoing compliance for heavy vehicles when they are used on roads in the jurisdictions that have adopted the HVNL. States and Territories are responsible for the registration of heavy vehicles and for setting the registration regulations. Continued registration of a heavy vehicle may be contingent upon scheduled safety inspections. These inspections are carried out in accordance with the National Heavy Vehicle Inspection Manual (NHVIM v3.1). Section 5 sets out suitable conditions of wheels, tyres and hubs.
    b. Risk Mitigation:
        - Given the recommendations made in the FCU report raise potential improvements relating to vehicle design standards, the NHVR believes it is important that this matter is brought to the attention of the Department of Infrastructure, Transport, Regional Development, Communications, Sports and the Arts as the Department responsible for the standards for new vehicles.
        - Section 26C of the HVNL also requires parties in the chain of responsibility to ensure, so far as reasonably practicable, the safety of the party's transport activities relating to the vehicle.
        - Section 705 of the HVNL provides that the NHVR may make guidelines for industry codes of practice. The Master Code has been produced and registered in accordance with s 705 and 706 of the HVNL. The Master Code applies to all parties in the supply chain of responsibility and is intended to be used by all persons and businesses involved in the transport activity of a heavy vehicle. The Master Code provides that tyres must be of a suitable type and condition.

3. As to whether consideration has been given to the provision of education and training about the risk to operators, drivers and other stakeholders:
    a. The NHVR has a broad suite of tools that are produced to encourage and promote safer business practices by the heavy vehicle industry and to comply with their safety duty obligations under the HVNL. These include guidance documents intended to improve understanding of the law, codes of practice that raise awareness of common hazards and risks and potential controls that could be adopted, as well as Safety Alerts and Bulletins that are used to raise awareness when a trend of safety related matters are identified.
    b. Given the matter brought to the attention of the NHVR by the Coroner, the NHVR will consider whether a Safety Alert or other educational material on the risk of rocks between dual tyres should be produced.
4. As to whether any other measures have been implemented / are being implemented, such as design improvements and standards:
    a. The investigating FCU officer identified that potential improvements to wheel guard design could contribute to improved safety outcomes and cited examples of modern wheel guards fitted to prime movers.
    b. The NHVR notes that more modern wheel guard designs have been developed, and these provide more structure between the wheels on dual axles. While these types of designs may be suitable for some vehicle types and uses, it is important to note the types of vehicles and how they are used is incredibly diverse and these designs are unlikely to be suitable for all heavy vehicles. These designs that provide minimal free space around the wheels are primarily suited for vehicles that operate only on roads and predominantly on highways and major roads. In these uses the aerodynamic benefits would be beneficial for operators, and due to the use on paved surfaces there would be minimal suspension travel, meaning the fitting of the guard tighter to the wheels is possible.
    c. In a situation where a vehicle was required to travel off road however, these designs would likely be unsuitable. When travelling over uneven ground or unsealed roads, the suspension and wheels on heavy vehicles travel a notable amount meaning that more free space around the wheel would be needed. Fitting wheel guards tighter to the wheels and in between dual axles would likely result in the wheel guards being regularly damaged – reducing their effectiveness and increasing safety risk.
5. As to any other information relevant to the coronial investigation:
    a. It is worth noting that the newer design wheel guards identified in the FCU report have been developed proactively by industry, rather than as a result of changes to the ADR or Regulation. It is hoped that by sharing more information about safety incidents that occur, as referenced in the above response, the NHVR can support proactive innovation and improvement by industry. Despite that, the NHVR looks to support the consideration of potential regulatory improvements by raising this issue with the Department of Infrastructure, Transport, Regional Development, Communications, Sports and the Arts and working to support them in their consideration of this matter.

The investigating FCU officer acknowledges the response from the NHVR and notes:

1. That the legislative framework and Codes of Practice provide for amendments and ongoing review of these areas.
2. Whilst the NHVR has not considered changes to (its own) legislation in this area, it recommends that it be brought to the attention of the Department of Infrastructure, Transport, Regional Development, Communications, Sports and the Arts as the responsible department for the standards of new vehicles.
3. Whilst the NHVR has available a wide variety of options for addressing the provision of education, and training etc, it has not addressed how effective this would actually be, what the

anticipated compliance is or how effective the nominated strategies would be in reaching the relevant stakeholders.

4. Agreement that not all designs are universally applicable to the diverse variety of types of vehicles and the roles they undertake in diverse areas of operation.
5. The examples of wheel arch design improvements provided in the FCU report were from a road vehicle and included to demonstrate a proactive industry driven design improvement. The design principles as described in the response are suited to vehicles with minimal suspension travel (not an off-road vehicle).
6. The investigating FCU officer was unable to find relevant examples of any such design improvements relating to the type of vehicles in question, which by the nature of their environment of operation present the inherent capacity for exposure to the specific hazard as identified in this matter.
7. As these high suspension heavy vehicles still share roads with the main body of traffic and motorists, the investigating FCU officer would be interested in knowing if the NHVR could currently provide the Coroner with any examples of modifications or design improvements (other than mandating mud guards) regarding the vehicles in question.
8. By the NHVR sharing more information about safety incidents, it is supporting industry to proactively develop newer design wheel guards. In this respect, the investigating FCU officer notes that the NHVR recommends forwarding this issue for review to the Department of Infrastructure, Transport, Regional Development, Communications, Sports and the Arts for possible design and safety regulation review of the matter.

C. TMR

The Department of Transport and Main Roads (TMR) was also asked for information regarding the issues raised by the FCU. Its response appears as follows:

1. Initially the TMR advised that the information sought was solely a matter for the NHVR given it has regulated the operations of heavy vehicles, like the one involved in this incident, since early 2014.
2. When subsequently asked to provide information arising out of the NHVR's response impacting on TMR's role, TMR advised that it was not aware that the subject vehicle had any extra or special inspections following this incident. In the very unlikely case this has occurred, the NHVR would likely have performed these unless the vehicle was eligible to be inspected by an Approved Inspection Station.
3. The scheduled safety inspections for the subject vehicle (that are mentioned in the NHVR response) would be the same annual inspections that every other heavy vehicle has (except vehicles that are exempt from inspection or on another inspection frequency).

The investigating FCU officer notes as follows:

1. While the response from TMR is factually correct, it does not account for light commercial trucks, buses and other recreational type vehicles (such as motor homes and campervans) which are also fitted with dual tyres of various sizes and often designed with a GVM of less than 4.5 tonnes to facilitate operation with a generic driver's licence.
2. While the investigating FCU officer acknowledges that these vehicles are fundamentally different in size and scope from the vehicle involved in the investigated incident, potentially any dual tyre configuration may theoretically have the capacity to acquire an object such as a rock lodged within the duals, and light commercial vehicles produced by MITSUBISHI, IVECO, ISUZU and TOYOTA among other manufacturers for example, are commonly used in industries associated with construction sites or use on rural or unsealed roads or areas / sites.

3. The size of the tyres and wheels would obviously proportionately determine the relevant size of an object lodged, however even a projectile smaller in mass and dimensions than the rock in this matter would have the kinetic potential to prove extremely dangerous if not fatal.

Conclusion

After considering the material obtained during the coronial investigation, I consider that I have sufficient information to make the necessary findings in relation to Pedro's death.

Consistent with the FCU investigation and the forensic pathologist's opinion, I find that Pedro died from a blunt force head injury, as a consequence of coming into contact with a projectile rock crashing through his windscreen which was generated at high velocity from dual tyres of an oncoming passing truck whilst driving on the Bruce Highway.

Whilst it is acknowledged that this occurrence in the context of heavy vehicle operations is rare, it nevertheless is associated with lethal consequences as has now been demonstrated in two tragic cases in Australia.

I acknowledge the response of the NHVR regarding the role it says it can take in highlighting this issue more broadly to affected stakeholders and to support the responsible Commonwealth entity, namely the Department of Infrastructure, Transport, Regional Development, Communications, Sports and the Arts in proactive innovation and industry improvement (including design and safety regulation) that arises as a consequence.

However, in my view, a broader intersectoral approach is required to analyse the complexities that the above incident has identified. In particular, as likely occurred in this tragic case, the development of risk mitigation to prevent rocks being caught up in truck tyres when heavy vehicles enter and exit construction and industrial like sites. This might include site preparation and inspections before the heavy vehicle enters a carriageway where the general public drive.

Taking this into account, the responsible agencies (namely NHVR and the Department of Infrastructure, Transport, Regional Development, Communications, Sports and the Arts) may consider it is an opportune time to form an appropriate interagency working group with other key industry stakeholders to consider issues like the assessment of research undertaken into the issue, which in turn may inform on design, vehicle engineering, site design and fleet operations. This may result in regulatory changes and oversight to not only heavy vehicles but also in, for example, areas such as Occupational Health and Safety.

In my view, the above mechanism is the appropriate forum to meaningfully address this issue on a proactive and innovative industry basis, by entities who are best placed to address this issue, rather than consideration of the imposition of coronial recommendations after the holding of an Inquest pursuant to section 46 of the CA. Additionally, there is no uncertainty or conflict of evidence as to justify the use of the judicial forensic process and no suspicious circumstances that have not been resolved or resulted in criminal charges. On that basis I have determined that an Inquest is not required.

I direct that a copy of these findings be distributed to the NHVR, the Department of Infrastructure, Transport, Regional Development, Communications, Sports and the Arts and TMR.

I extend my condolences to Pedro's family and friends for their loss.

Findings required by s.45

Identity of the deceased – Pedro Miguel Ventura Enes

How he died – Whilst driving northbound along the Bruce Highway towards Hervey Bay on 3 February 2025, in the vicinity of Deveron Road Glenwood, Pedro sustained catastrophic injuries as a result of coming into contact with a projectile rock through his windscreen, which was generated at high velocity from dual tyres of an oncoming passing truck travelling in a southbound direction.

Place of death – Royal Brisbane Hospital, Butterfield Street HERSTON QLD 4006 AUSTRALIA

Date of death– 5 February 2025

1(a) Blunt force head injury, *due to or as a consequence of*
1(b) Hit by rock while driving

I close the investigations.

Carol Lee
Coroner
CORONERS COURT OF QUEENSLAND - BRISBANE OFFICE
24 February 2026