



ACTIVE SPEED  
CONSTRICTION SYSTEM

TIRE BRAKE  
CONTAINING SYSTEM

DAICON DRIVER  
FAILSAFE SYSTEM



ACTIVE BRAKE  
ASSISTION SYSTEM

COLLISION MENIRONGS  
FAILSAFE SYSTEM

RADAR



ADVANCE DRIVER  
ASSISSTIONS  
SYSTEM

RADAR

3DAR 5LDAR

TIRE BRAK  
SYSTEM

RADAR

COLLISION BENSERS  
SYSTEM

336ANT DRIVERS  
ASSIMENISYSTEM

PARK BRAKE  
FAILSAFE SYSTEM

3IDAR SENSORS

LIDAR

LIDAR

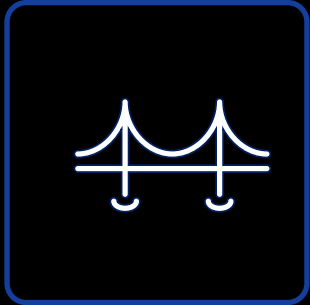
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# Transport Safety with Advanced Vehicle Controls

Exploring some of the latest advancements in AI / ADAS and the need for “*automatic driver intervention controls*” with safety technologies that are transforming the transport and logistics sector, mitigating risks, and improving driver safety.

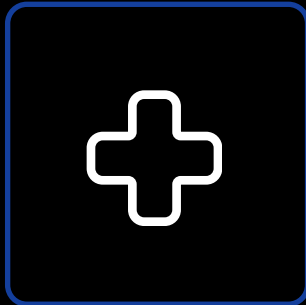
# A few Heavy Transport Mitigation Controls / Status

Over-head Vehicle impacts of Road and Rail Structures



- ❑ Conventional warning mitigation, signs, lasers sensors, holographic images, sacrificial structures, etc.
- ❑ On- going issue- 400 bridge / infrastructure impacts / annum in Qld alone.
- ❑ **No effective solution.**

Collision of trains and vehicles on railway level crossings



- ❑ Conventional warning mitigation, “passive (signs) and “active” (lights, bells and boom gates).
- ❑ 1,000 near misses / annum.
- ❑ Approx 34 collisions/ annum.
- ❑ **No effective solution.**

Vehicle Rollaway / handbrake failsafe systems



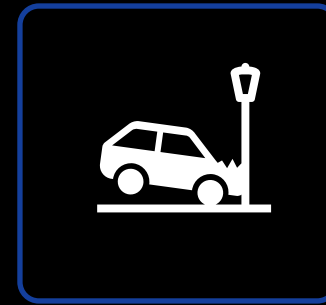
- ❑ Conventional in- cabin driver alerts- no AEB.
- ❑ Rollways occur everyday.
- ❑ OTSI Reports- [Rollways](#) on 15 x Bus rollaways 2024.
- ❑ Warnings and videos provided by [NSW SafeWork](#) and [NT SafeWork](#).
- ❑ [QWHS Rollaway Campaign](#)
- ❑ **No ADR / legislation.**

Reversing Technologies with AEB- vehicles, cyclists, pedestrians (V2P + V2V + VI)



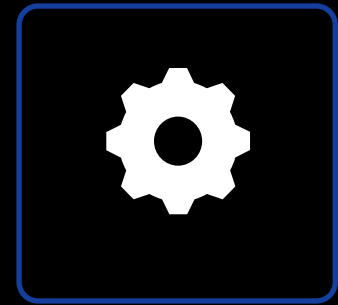
- ❑ Driver Visibility + Proximity Detection + AEB- Reversing only
- ❑ [ADR 108/00](#) (2025 / 2027) + [ADR 35/07](#) mandate / legislation.
- ❑ No requirement for forward travel detection / AEB.
- ❑ Note in USA mandate AEB on light trucks + passenger vehicle (2029).
- ❑ **No legislation for retrofitting**

Reversing and High Speed Rear End Collisions



- ❑ High speed rear end crashes occur
- ❑ New Vehicles only / no legislation for retrofitting
- ❑ [ADR 97/00](#) (2025) + [ADR35/07](#).
- ❑ **No legislation for retrofitting.**

Tyre Monitoring Systems- Truck Fires / Roll- overs



- ❑ OTSI Bus Fire Reports [2023 Report](#).
- ❑ NTI / NTARC [Vehicle crash statistics report](#).
- ❑ [EU mandates TMSystems](#).
- ❑ TfNSW Bus mandate for [TMSystems \(2016\)](#).
- ❑ Australian [Federal Safety Committee](#) **considering** ADR mandate / legislation.
- ❑ Note- mandated worldwide on all passenger vehicles (new).

Addressing key safety issues through advanced mitigation technologies and automatic intervention we can significantly improve driver, passenger, and pedestrian safety across the heavy transportation and logistics sectors- but for it to work **legislation / ADR's** need to implemented- not only for new but also retrofitting **existing** vehicles.

# Recommended and available mitigation technology controls?

- It is worthwhile to note that the following document acknowledges many different recommended Safety Mitigation Controls for the Heavy vehicle Industry- most yet to be implemented.

## [2024- Safety Features and Technologies for Heavy Vehicles](#)

- This document has been republished and updated by the TfNSW and also Department of Victoria Roads since 2013, starting with 5 x safety mitigation technologies and now listing >47 safety mitigation controls in their 2024 publication!
- Some are now mandated (ADR 108/00, ADR 97/00 and ADR 35/00).







## Human Error / Behavior / Situation Awareness / Response.

- ❑ **Human Error:** was the sole cause in 57% of all accidents and was a contributing factor in over 90% ([NRSPP](#)).
- ❑ **Distraction (Inattention):** from all sources responsible for 78% of crashes and 65% of near-crashes ([NRSPP](#)).
- ❑ **Situation Awareness > Decision > Acton** ([Marc Green- Human Factors and Science](#)) takes time to implement corrective action.
  - ✓ **Awareness Time:** A driver needs time become **Aware** there is a need to take action.
  - ✓ **Decision Delay:** Thinking time is required to make a **Decision** for corrective **Action** (e.g. start to apply brakes).
  - ✓ **Corrective Action:** Studies have proven this takes between **1.5- 3.5 seconds** (or longer with **fatigue** and other factors).
- ❑ For a Truck and single Trailer, it takes about **4.6 seconds** to bring the Rig to a stop - longer for larger Rigs.
- ❑ At **100 km / hour in- dry conditions**, stopping distance can be **>200 metres**. With longer Rigs, **wet conditions**, braking distance can again take a **lot longer**.



# How effective is AEB (+ESC) Driver Intervention Systems?

Assistant minister to the deputy prime minister, Kevin Hogan states (March 2022):

*“Vehicle technology has an important role to play in saving lives and livelihoods on our roads, which is why we have introduced new standards requiring AEB and ESC systems to be installed in all new heavy vehicles.”*

*“Mandating this technology for heavy vehicles is expected to save around 100 lives and avoid more than 2300 serious injuries”*

AEB systems are designed to detect forward collisions, warn the driver and automatically apply the brakes should they not respond.

ESC systems can detect the risk of a rollover and decelerate the vehicle to prevent an incident from occurring while also monitoring a drift in the driver’s intended course, correcting the issue to place the vehicle back on track.

*“ESC systems for heavy vehicles are estimated to reduce loss of control and rollover crashes by up to 30%, with AEB systems expected to reduce crashes involving a heavy vehicle impacting the rear of another vehicle by up to 57%.”*

*“AEB technology will be particularly impactful for our nation’s articulated vehicles, which see around 70% of fatalities and just under half of the serious injuries from crashes involving heavy vehicles striking the rear of another vehicle.”*

# Some Safety Takeaway's

"When endeavouring to mitigate a risk, one needs to ensure not to create other risks"

"Whenever there is kinetic energy between human and machine, there exists a risk of contact"

"Humans are prone to error, mistakes, distraction, complacency, and, at times, outright non-compliance (risk taking)."

"Whilst technology is advanced, human reaction for situational awareness and corrective action is too slow, making automatic driver intervention essential."

"Safety mitigation with the use of AI / ADAS safety controls will only be assured with fully autonomous vehicles and where human and vehicle separation is assured"

AI/ADAS audible and visual (multiple) alerts in the cabin can be distracting. Relying on this technology to only "inform" the driver has proven to have limited effectiveness making- **automatic driver intervention control** essential in some cases."

"ADR regulations cover only new vehicles, but over 5 million heavy/commercial vehicles remain on the road, potentially for 20+ years, posing risks that conflict with ADR safety goals."

"Human error and distraction are not limited to truck drivers; other road users also impact the truck driver's response time."

Enforcement and Penalties have proven to have limited mitigation effect- we still have unacceptable carnage on the road.

"Zero harm will remain unachievable until we ensure complete *separation* between *human* and *machine*"

### QUESTION TIME

QUESTION TIME



QUESTION TIME

# Q&A

## QUESTION

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QUESTION TIME

