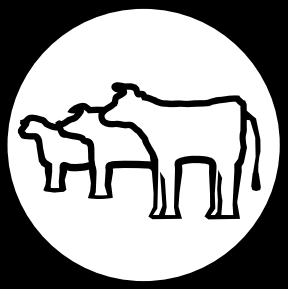
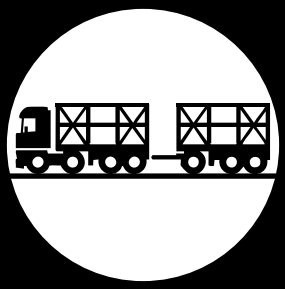
Handbook

An introduction to smart braking technology for livestock truck drivers

The transport industry is one of the most dangerous in Australia. Livestock transport presents significantly greater challenges than linehaul, due to factors such as:



Animal handling and welfare



Managing dynamic loads

Navigating regional and remote areas

Dealing with road quality which can range from poor to worse

Managing Risks and Welfare in Livestock Transport

Livestock transport presents fundamental hazards, such as loading and unloading livestock, and the fact that you cannot tie them down meaning it is always going to be a dynamic load. Additionally, there is the need to be concerned about animal welfare, taking additional breaks, and thinking about temperatures, water, and time off feed. Livestock transport mostly operates in remote and regional areas, and drivers go to places that almost nobody else goes. In such areas, road types can vary from little more than two tyre tracks through the grass up to regional highways, whose quality may reflect an overdue need for investment

Given those hazards, the skills and professionalism of livestock truck drivers are highly valued, yet it is important to acknowledge that it is human to make mistakes. The key is to minimise the cost of these mistakes as much as possible, so that when they happen, safety is not compromised. According to the National Truck Accident Research Centre (NTARC) the single vehicle untripped rollover (SVURO) is the leading crash in livestock transport. This type of event starts with the wheels lifting off the ground in a corner or a bend, and then the truck rolling over. In this way, it is the rollover that causes the crash, rather than a crash causing the rollover.

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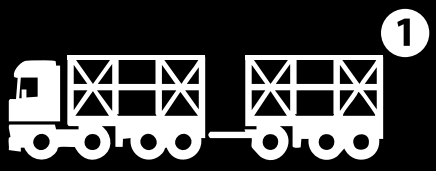
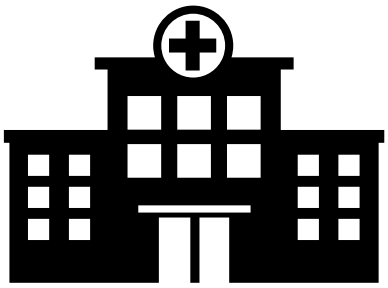
In 2022, SVUROs were the leading type of serious incident involving livestock trucks, with 44% of incidents over $50k. More than 95% of roll-over crashes were single vehicle.



95% of roll-over crashes were single vehicle.

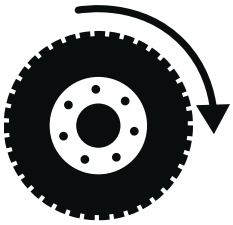
The data shows the average age of drivers involved in SVURO crashes was 43, meaning this is not a problem exclusively affecting young drivers. Likewise, drivers involved in such incidents had an average experience in the license category they were driving at the time of the crash of 13 years. From this information it can be inferred that it is middle-aged and well-experienced drivers who are getting involved in this type of incident, despite their trajectory in the profession. A concerning aspect presented by the data is that in between one in 41 and one in 50 of these rollover crashes, the driver of the truck is killed. Fortunately, different vehicle technologies and systems can help prevent SVUROs.



In 1/50 rollover crashes the driver is killed

1) Anti-lock Braking Systems (ABS)

Firstly, Anti-lock Braking System, or most commonly know as ABS, is a technology designed to keep your wheels rotating and not have them locked up and sliding under heavy braking. This is important because sliding wheels do not have directional control, and a v that is still rotating under heavy braking can slow a vehicle down quicker, making stopping distances shorter.



ABS keeps wheels rolling, preventing lock up and sliding.

ABS works by having wheel speed sensors fitted to some (but not usually all) of the wheel ends in each axle group on a truck or trailer. These wheel speed sensors allow the ABS to know that some axles have locked up while others are still rolling and it can then release some of the air pressure to the brake chambers for that axle or axle group until it senses that the wheels have started rotating again, and then reapply that pressure.

ABS helps you monitor wheel speed and modulate braking for groups of wheel ends, which provides directional stability under brakes, avoids flat-spotted tyres, and reduces stopping distances.

Reduces stopping distances.

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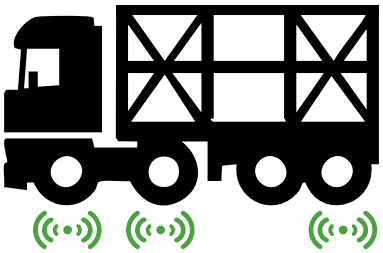
2) Electronic Braking Systems (EBS)

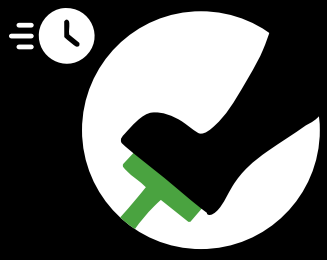
Secondly, Electronic Braking System, or most commonly known as EBS, is a technology designed to generate a faster brake response. In the traditional pneumatic braking system there is an air supply that goes to the brake valve for each axle group, and a control or signal line. When you apply the brake pedal, it releases a proportional air pressure signal down the control line and at the valve that signal releases an equivalent but much bigger volume of air to the brake chambers applying the brakes.

With EBS, all those pneumatic controls are retained, but with electronically controlled actuators and an electronic control signal. This means that instead of waiting for that pneumatic signal to weave its way through the prime mover and downs between each of your trailers, there is a near instantaneous electronic signal to every brake valve in the system. This results in brakes that apply more quickly and where all of the brakes on the combination apply virtually simultaneously.



Instant electronic signal to every brake valve in the system.

EBS benefit the driver by providing a faster brake response, shorter stopping distances, and a combination that should be more stable under brakes.



Faster braking response.

Shorter stopping distances.

Stable vehicle during braking.

Additionally, having electronic control EBS effectively enables other technologies, such as electronic load sensing and brake force distribution.

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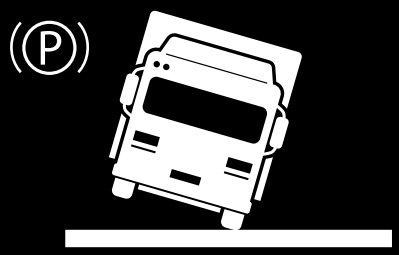
3) Electronic Stability Control (ESC)

Thirdly, Electronic Stability Control, or most commonly known as ESC, is a technology designed to detect and respond to potential rollover events. The system has sensors that can detect high G forces and wheel-lift events, and apply brakes the on laden side to stabilise combination. It benefits drivers by reducing road wear to rear-view mirrors, and avoiding serious and potentially fatal incidents.



Supporting Change

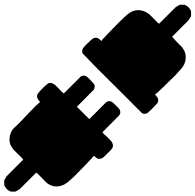
It is important to identify whether a vehicle has any of these systems, by looking for an indication such as a plate. For instance, the EBS data plate is most commonly (but not always) fitted around the front or front left side of the trailer. If the equipment has the relevant plugs and sockets, it is necessary to ensure it is adequately plugged in. When the vehicle is starting up you should see the dash lights for the brake system illuminate. If they either don't come on or stay illuminated, you need to

Some common concerns related to these systems are related to how the brakes in a combination vehicle respond or 'feel' different when the EBS system is functioning. It is important to validate this concern because in the livestock space, any change related to the vehicle brakes can have a real impact on animal welfare. It is recommended to have a trial for a period (e.g., two weeks) for drivers to report back any issues. If there is, it is important to communicate with the brake system designer/certifier.

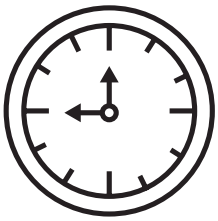
Another common concern is being watched. This concern is entirely valid and may reflect past shortcomings in communication between employers and employees in transport businesses. It is recommended to have an open and honest discussion with staff about their concerns and the organisation's plans to use the system.

Additionally, some drivers may be concerned that a system failure could leave them stranded. It might be motivated by their high level of concern about animal welfare and as a result, may reflect positively on their cultural fit for livestock transport.

In this case, highlight that smart braking systems are added on top of a traditional pneumatic braking system, meaning if the system fails, it fails back to the system the industry has been running for decades.



Ensure relevant plugs are adequately plugged in.



A trial period is recommended.

Have an open discussion about concerns.

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