

The information in this factsheet describes the legal requirements in the Land Transport Rule: Vehicle Dimensions and Mass 2016 (the Rule) that apply to heavy vehicle stability, and explains what a static roll threshold (SRT) is, and which vehicles must be certified for SRT.

The stability of vehicles can be greatly affected by the way they're loaded. The load needs to be arranged so that its mass and height are appropriate for the design of the vehicle and type of load.

In New Zealand, prior to 2002, one in 11 log trucks were rolling over each year.

The Rule introduced a minimum stability requirement for heavy vehicles and heavy vehicle combinations. This has been in place for several years, and rollover among log trucks is now much less common.

## What is a static roll threshold?

The SRT of a vehicle is a **measure of the potential** for that vehicle to roll over sideways. Vehicles with a low SRT are more likely to roll over than those with a higher SRT, especially when going around sharp bends and in sudden emergency manoeuvres. That means the lower your SRT the less stable your vehicle is.

To improve their stability, heavy vehicles with a gross vehicle mass (GVM) greater than certain specified limits **must meet or exceed a minimum** static roll threshold value.

If a vehicle doesn't meet (or exceed) the required stability limit, its stability can be improved by operating it with a reduced load mass and/or reduced load height, or the vehicle can be modified so it has sufficient roll stiffness to operate safely at maximum carrying capacity.

## Which vehicles must meet SRT?

Research into heavy vehicle rollovers in New Zealand has shown that goods service vehicles with a GVM over 12 tonnes (class NC) and trailers with a GVM over 10 tonnes (class TD) need to have a SRT value of at least 0.35g ('g' is the acceleration due to gravity). Vehicles operating with a high productivity motor vehicle (HPMV) permit also need to meet SRT.

## What are the legal requirements?

If you operate a goods service vehicle, there are some important things you have to do to meet the legal requirements in relation to SRT.

- If you operate a trailer that has a gross vehicle mass of more than 10 tonnes (class TD) and a body height or load height exceeding 2.8 metres from the ground, you must get an SRT compliance certificate and have the information from this endorsed on your vehicle's certificate of loading.

You are also legally required to load and operate the trailer so it has an SRT of at least 0.35g.

- If you operate a class NC truck, you are legally required to load and operate it so it has an SRT of at least 0.35g. (Use the SRT calculator to check this.)

## Why do only class TD trailers need an SRT certificate?

Research into heavy vehicle rollover has shown that class TD trailers are the heavy vehicles at most risk of rollover. These are the heaviest trailers, with GVM over 10 tonnes. It is necessary to have these assessed and certified so the appropriate mass and height limits are available to operators and police.

## How do I get an SRT compliance certificate?

To get an SRT compliance certificate, you need to have your vehicle assessed by an SRT certifier or SRT vehicle inspector approved by the NZ Transport Agency.

## How is the assessment carried out?

The most common way of assessing the vehicle is with a computer programme called the SRT Calculator. The SRT Calculator is a computer simulation that takes into account the vehicle's loading characteristics (deck height) and the vehicle's mechanical componentry that affects the roll stiffness (suspension type, track width, wheels and tyres).

There are two types of assessment carried out: level 1 and level 2. These are described at the end of this factsheet.

## How do I operate a trailer safely to prevent rollover?

If you operate a TD trailer, you must ensure it is loaded within the mass and height limits endorsed on its certificate of loading or on an SRT compliance certificate that you carry in its towing vehicle. (The latter must be produced to an enforcement officer on demand.)

While NC trucks don't need this certification, there is still a legal requirement that they are loaded and operated safely to avoid rollover.

## Can I check my own SRT?

Yes, but only for your own information. You can use the SRT calculator on the Transport Agency website.

## What vehicles are exempt from SRT requirements?

Some vehicles are considered to have a low risk of rollover and are therefore exempt from SRT requirements. The HPMVs are not exempt from SRT requirements; please refer to factsheet 13g *High productivity motor vehicles*.

Vehicles exempt from SRT requirements:

- Rigid vehicles fitted with a turntable coupling to tow a semi-trailer, provided they don't have a deck or a body for carrying a load (these are usually called 'tractor units').
- Vehicles (including their loads) that have dimensions greater than standard or have axle weights greater than a vehicle axle index of 1.1, provided such vehicles comply with the relevant legislation and the conditions of any permits they need to operate outside the standard dimensions and axle weights.
- Construction vehicles being used on roads that are designated 'road construction zones' under the Heavy Motor Vehicle Regulations.
- Construction vehicles being used on roads designated 'roadworks zones' by a road controlling authority.
- Special vehicles that are not usually used on roads but that have been authorised to cross a particular road by a road controlling authority.
- Motor scrapers and similar vehicles that are designed for transporting bulk materials and only move along roads without a load.
- Vehicles with tipping load bodies, but only when they are in the process of discharging their load by tipping up their body and moving at low speed. When the load body isn't tipped, these vehicles need to comply with SRT requirements.
- Vehicles engaged in a vehicle recovery service that are designed to tow or transport disabled heavy vehicles.
- Vintage or veteran vehicles first registered before 1 January 1940.

## Level 1 assessment

The level 1 assessment is a basic assessment where typical data for flat, sloping or step-deck trailers is used to assess their rollover performance. Level 1 assessment caters for the following types of trailer:

- full trailers (including pole trailers) with stanchions or relatively flat decks
- semi-trailers (flat decks or step-decks, such as in low loaders or B-trains)
- simple trailers with relatively flat decks.

Two typical load scenarios – mixed freight or uniform density – are used:

- A load of mixed freight has the centre of gravity equivalent to 40 percent of the load height (taken from the base of the load).
- A load of uniform density (eg gravel, logs and grain) has the centre of gravity halfway up the load. Construction equipment and machinery may also be assessed this way if its centre of gravity does not exceed half its load height above deck.
- The SRT inspector or certifier assesses the vehicle's rollover performance at the maximum legal mass limits

and maximum allowable load heights. (The mass limits are assessed at maximum potential axle set limits or a lower limit controlled by trailer:truck mass ratio, if applicable.)

## Overweight loads

If you carry overweight loads under an overweight permit, you may elect to increase the mass limit to a vehicle axle index (VAI) of 1.1. Unless the vehicle has a body that restricts the load height, the assessment will be made at 4.3 metres.

## Trailer meets requirement

If your trailer, at maximum potential load mass and height, meets or exceeds the 0.35g SRT requirement, an SRT certificate will be issued. The certificate of loading will be endorsed with the maximum load and height values.

## Trailer doesn't meet requirement

If your trailer doesn't meet the 0.35g SRT requirement at maximum load and height, a reduced mass/reduced height certificate will be issued. This will specify the reduced gross mass or reduced load height that you can operate the trailer with to meet the 0.35g SRT. (It may also include a table of allowable gross mass/load height combinations.) The certificate of loading will be endorsed accordingly. Alternatively, you may elect to have a more detailed analysis done by undergoing a level 2 assessment.

## Level 2 assessment

The level 2 assessment requires more detailed data about the vehicle's mechanical characteristics, such as the actual stiffness values of the suspension, and load characteristics.

This should give a more accurate assessment of the trailer's SRT, which could mean that a reduction of mass or load height is less likely.

A level 2 assessment is also needed when the load's centre of gravity cannot easily be assessed (eg for irregular or complex shaped hoppers or body shapes of irregular cross section). Non-uniform loads, such as construction machinery and equipment, will need level 2 certification if they have not been certified as uniform density under level 1. In these cases, a level 2 SRT certifying engineer must assess the vehicle.

## Trailer meets requirement

If your trailer, at maximum potential load mass and height, meets or exceeds the 0.35g SRT requirement, an SRT certificate will be issued. (The certificate of loading will be endorsed with the maximum load and height values.)

## Trailer doesn't meet requirement

If your trailer doesn't meet the 0.35g SRT requirement, a reduced mass/reduced height certificate will be issued. This will specify the reduced gross mass or reduced load height that you can operate the trailer with to meet the 0.35g SRT. (It may also include a table of allowable gross mass/load height combinations.) The certificate of loading will be endorsed with these maximum load and height values.

If your trailer doesn't meet the required 0.35g SRT, you may wish to have it modified so it does. Talk to your engineer about the best options.

## Where can I find out more?

- *Factsheet 13 Vehicle dimensions and mass: guide to the factsheet 13 series*
- *Factsheet 13a Heavy rigid vehicles*
- *Factsheet 13b Light rigid vehicles*
- *Factsheet 13c Heavy trailers and combination vehicles*
- *Factsheet 13d Trailers: Light simple trailers*
- *Factsheet 13f Heavy buses*
- *Factsheet 13g High Productivity motor vehicles*
- *Factsheet 13h Specialist vehicles*
- *Factsheet 53a Overdimension vehicles and loads*
- *Factsheet 53b Overdimension roles and responsibilities*
- *Guide to safe loading and towing for light vehicles*
- Land Transport Rule 41001: Vehicle Dimensions and Mass 2002 and its subsequent amendments

The information in this factsheet is a general guide only. It is not the source of the law and should not be used in place of authoritative legal documents. Some factsheets are updated frequently and print versions can quickly become out of date. If the currency of the information you are reading is important, check the factsheet index on our website ([www.nzta.govt.nz/factsheets](http://www.nzta.govt.nz/factsheets)) or call us on 0800 108 809.

### Contact details

- Call our contact centre: 0800 108 809.
- Visit our website: [www.nzta.govt.nz](http://www.nzta.govt.nz).
- Email us: [info@nzta.govt.nz](mailto:info@nzta.govt.nz).
- Write to us: NZ Transport Agency, Private Bag 11777, Palmerston North 4442.