NRSPP
NATIONAL ROAD SAFETY
PARTNERSHIP
PROGRAM

FACT SHEET

Fact Sheet:
Safe Towing – Understanding Weight and Loading

Introduction

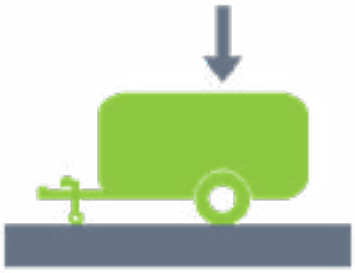
Towing a trailer, caravan or boat can be a useful way to relocate to a new house, move goods for work, or a fun way to explore new places and remote destinations. However, there are some potential issues that should be considered to ensure you are towing safely.

Jargon Busting

Vehicle towing, weight and loading jargon can often seem confusing and unnecessarily complex, but it is important to understand to ensure your safety when towing. Some of the most common vehicle towing, weight and loading jargon is explained in this section.

Aggregate Trailer Mass (ATM)

Aggregate trailer mass is the weight of the trailer when not attached to a vehicle.



Tow Ball Down Weight

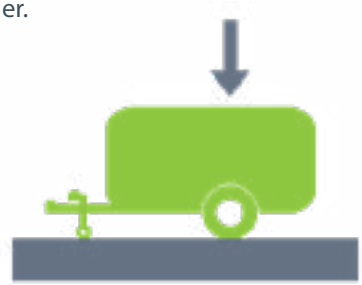
Tow ball down weight is the weight the trailer exerts on the towbar. It must not exceed maximum values specified by vehicle, towbar or trailer manufacturers.

Gross Trailer Mass (GTM)

Gross trailer mass is the weight of the trailer when attached to a vehicle. It is equal to the difference between aggregate trailer mass and tow ball down weight.

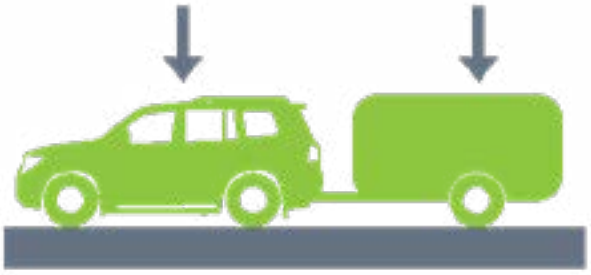
Towing Capacity

Towing capacity is the maximum weight a vehicle is able to tow, as specified by the vehicle manufacturer. It relates to aggregate trailer mass and the presence of a braking system in the trailer.



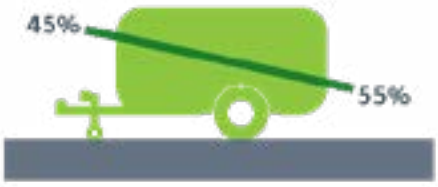
Gross Combined Mass (GCM)

Gross combined mass is the maximum weight of a vehicle and trailer, including all contents and people, as specified by the vehicle manufacturer.



Trailer Weight Balance

Trailer weight balance is the distribution of loading in a trailer, usually expressed as percentage of front and rear weight.



Sources: Pedders Techstop (2018)

Impacts of Increased Vehicle and Trailer Weight

Increased weight in your vehicle or trailer can impact handling, vehicle behaviour and put excess strain on certain vehicle components. Overloading your vehicle can produce unwanted effects which impact vehicle handling and road safety, but but safe driving can be managed with moderate additional loads. Common effects of additional weight include:

Chassis Dynamics – increased weight can impact the rotational movements of your vehicle, affecting vehicle handling.

Suspension Travel – increased weight can reduce the effectiveness of your vehicles suspension system, decreasing comfort and control, and increasing wear and tear on suspension and steering.

Braking Efficiency and Distance – increased weight amplifies the energy generated and stress on your brakes when slowing or stopping.

Tyre Contact and Steering Effectiveness – excessive rear loading on your vehicle may transfer weight off the front tires. This can reduce front tire contact with the road, impacting steering and braking efficiency.

Wheel Alignment – increased weight may impact wheel and suspension geometry. This can reduce tire contact with the road and increase tire wear, impacting steering and braking efficiency.

Sources: Pedders Techstop (2018)

Tips for Safe Towing and Weight Management

The excitement of a new house or holiday can understandably be a source of distraction but before you tow and when you are on the road it is important to do a few checks to ensure the safety of yourself, family, friends and other road users.

Before you tow:

- Ensure the weight of the vehicle(s) are within the tow vehicle and trailer manufacturer's specification
  - Aggregate trailer mass above 750 kg requires a trailer braking system
- Ensure the tow ball and related components have not exceeded the manufacturer's recommended lifespan
- Trailer loads are appropriately distributed and securely fastened
  - Loads should be kept low and close to the trailer's axle
  - As a rule of thumb, trailer weight balance should have slightly more weight in the front (60/40 split) and tow ball down weight should be about 5-10% of the aggregate trailer mass (check manufacturer specifications for optimal loading distribution)
- Trailer dimensions, including load, do not exceed maximum for overhang and width and allow for use of rear vision mirrors
- Check licence requirements for driving with a trailer in your state
- Tow ball and socket are secure and well-fitting
- Safety chains are appropriate for the aggregate trailer mass and securely fastened
- Brakes, lights and other electrical components of your vehicle and trailer are working

On the Road:

- Remain aware of the impacts of additional weight on handling, and avoid sudden accelerating, braking or steering manoeuvres
  - Increasing the gross combined mass increases braking distance and time
- When following other vehicles, maintain adequate gap to stop safely considering impact of additional weight on braking efficiency
- When turning or overtaking, consider additional trailer length and slower rate of acceleration
- Regularly check:
  - Brake temperature and operation
  - Engine temperature
  - Loads are restrained and secure
  - Lights and electrical components are connected and operational
  - Couplings and safety chains are securely fastened

This Fact Sheet is a summary of key checks you can do to ensure you are towing safely, for a more complete list please see the sources listed below.

References:

Pedders Techstop (2018), Tow and load – Explained, Issue 22/2018, Pedders Suspension, Melbourne, VIC

RMS (2018), Road user handbook, Pub. 18.699, Roads and Maritime Services, Sydney, NSW <https://www.rms.nsw.gov.au/roads/safety-rules/road-rules/towing.html>

TMR (2019), Towing vehicles and trailers, Department of Transport and Main Roads, Brisbane, QLD <https://www.qld.gov.au/transport/vehicle-safety/towing/towing-vehicles-and-trailers>

VicRoads (2018), Pre-trip caravan checklist, VicRoads, Melbourne, VIC <https://www.vicroads.vic.gov.au/safety-and-road-rules/vehicle-safety/safe-caravanning>

NRSPP acknowledges the contribution of:

PEDDERS SUSPENSION & BRAKES