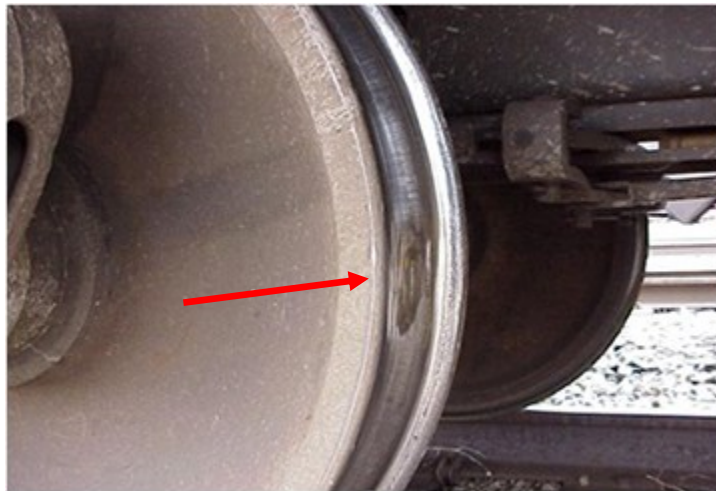


## Wheel Flats

Subway trains run with steel wheels on steel rails. Certain conditions e.g. moisture (from condensation, rain, frost, snow or ice storms), dirty rails (from environmental soot, dirt, mud or debris build-up on surfaces) and autumn leaves on the tracks make rails slippery and cause trains to experience reduced adhesion. This can lead to wheel slip when the train is taking power, and wheel slide when the train is braking.

Rapid transition from slippery rail to dry rail and back can sometimes result in wheel flats being created on wheels during braking. The flat spot occurs when a rail vehicle's wheelset is dragged along the rail after the wheel/axle has stopped rotating. See below for the picture of a typical wheel flat:



**Example of a Wheel Flat**

Flat spots are usually caused by use of the emergency brake, or slip and slide conditions that cause wheels to lock up while the train is still moving. Flat spots are more common in the autumn and winter when the rails are slippery, but can also be caused by faulty brakes or wheelset bearings.

Once these wheel flats are created, they provide the characteristic “thump-thump-thump” that can be heard by the train passengers and neighbouring residences as the damaged wheels impact the hard rails. The sound and vibration are generated as the edges of the wheel flat impact on the rail.