

King Township : 413 vs 407

How to reduce congestion - get more trucks onto the 407.

We would all appreciate less traffic congestion. It makes our commute longer, costing us time and money. Even for those of us who don't drive, we know it is generating CO2, which is not healthy for us or the climate.

How can we reduce congestion? Get more trucks onto the 407. The majority owner of the 407 highway is the Canada Pension Plan (CPP).

If the 413 goes ahead its going to mean years of traffic disruption for King, as it terminates near the existing service centre on the 400. And the traffic flow between the 400/413 interchange may result in longer commutes as traffic backs up.

Congestion results from a variety of factors, and certainly large scale road construction brings equipment and materials over our roads for years.

We have a wonderful E-W highway across the GTA, already on our doorstep, the 407. We would all love to get that thing back.

The initiation of reclamation of highway 407, instead of building the 413, brings a number of advantages, and we wouldn't have to wait 10-15 years for the relief:

- CO2 emission reduction (otherwise ++CO2 taxes)
- Avoidance of 10+ years of construction delay
- Avoidance of environmental destruction
- Avoidance of 10+ years of supply chain disruptions
- Protection of local farmland
- Less frustrated truck drivers
- Increased ETR 407 profit

One means of starting to reclaim the 407 would be to allow unloaded trucks to travel at greatly reduced tolls.

Heavily loaded trucks degrade highways. The heavier the load, the more the damage. No doubt that maintenance cost drives the ETR407 reluctance to encourage truck traffic along it.

Unloaded trucks generate less road damage. If tolling fees were based on truck axle load, the business case for unloaded trucks going home on the 407 would be enhanced. And if one takes into account increasing CO2 taxes, it will eventually become worthwhile for trucking companies.

The ability to detect truck load, 'on the fly' is a technology development already in progress. Globvision, a Canadian artificial intelligence company is developing it for the newly rebuilt Champlain Bridge in Montreal. The Champlain Bridge is not a tolled highway. They're just interested in detecting overloaded trucks.

Implementation on the 407 could be done by a specialized load sensor installed at each on ramp, at pavement level. As a truck passes over, its weight is monitored and sent to software that sets toll rate. The existing peak toll rates are:

Vehicle	Weight	Axle Load	Toll Charge*
Light Vehicle	<5000 kg	<2500 kg	\$0.4723 /km
Heavy Single		<19,100 kg**	\$0.9486 /km
Heavy Multiple	63,500 kg GVW**	<19,100 kg**	\$1.4229 /km

*toll charge as per [Map & Toll Calculator | Highway 407 \(on407.ca\)](#), February 11, 2022

**[Ontario Canada Axle Weight Limits | Regulations & Requirements \(titanww.com\)](#), February 12, 2022

Consider the example of a 3 axle dump truck.

Single heavy loaded: 80,000 lb

Single heavy unloaded: 35000 lb

Difference 45000 lb ~ 20,000 kg

In terms of axle load:

3 axle loaded truck: 80,000 lb; 26667 lb/axle = 12,121 kg/axle

3 axles unloaded truck: 50,230; 16743 lb/axle = 7,610 kg/axle

If we consider the results of technical study, "Vehicle wheel loads and road pavement wear" [Vehicle-wheel-loads-and-road-pavement-wear-Addis-.pdf \(hvtforum.org\)](#), that means the unloaded truck causes much less than 50% road crack damage (the infamous 4th power law would suggest as low as 85% less), compared with the loaded truck.

The 'on the fly' detection of truck load has far reaching applications. It would be useful for reducing the idling time for trucks checking in at our 400 series highway Weigh Stations. It is a product that has international sales potential.