

# TORONTO STAFF REPORT

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May 23, 2006

To: Works Committee

From: Gary Welsh, General Manager, Transportation Services

Subject: Large Trucks and Cyclist/Pedestrian Safety  
(All Wards)

Purpose:

This report provides a brief summary of pedestrian and cyclist injuries in collisions involving large trucks. The report also addresses potential safety measures for preventing collisions between City of Toronto trucks and pedestrians/cyclists.

Financial Implications and Impact Statement:

There are no immediate financial implications resulting from the adoption of this report.

Recommendations:

It is recommended that:

- (1) City Council reiterate its request to Transport Canada that they develop national design standards and regulations for side guards on large trucks; and
- (2) this report be forwarded to the Cycling Committee for their information.

Background:

In 1996, the Regional Coroner for Toronto initiated an investigation in response to two cycling fatalities involving large trucks in July of that year. In his final report entitled, "A Report on Cycling Fatalities in Toronto 1986-1996" (July 1998), the Coroner made 15 recommendations including the following:

"Transport Canada investigate the feasibility of requiring "side guards" for large trucks, trailers and buses operated in urban areas to prevent pedestrians and cyclists being run over by the rear wheels in collisions with these large vehicles."

In 1999, Transport Canada advised City staff that, “Such guards are the subject of a European (UN ECE) Regulation, the purpose of which is to minimise the possibility of unprotected road users falling under the sides of vehicles and being caught under the wheels. There is no similar Canadian regulation because the nature of the traffic mix in Canada is different to that in Europe; there being a greater proportion of unprotected road users (pedestrians, cyclists and motor cyclists) in close proximity to trucks and trailers in Europe than there are in this country... Nevertheless, the situation is being monitored and if regulatory action on side guards is necessary, it will be initiated.” Recent discussions with Transport Canada staff indicate that they currently are not considering regulations to require side guards on large trucks.

City Council, at its meeting on January 31, February 1 and 2, 2006, considered a Notice of Motion recommending that “City Council support a regulation requiring the addition of side guards for large trucks operating within urban areas and request that Transport Canada produce and implement such a regulation as soon as possible.” City Council referred the Notice of Motion to the Planning and Transportation Committee. At its meeting on March 6, 2006, the Planning and Transportation Committee referred the Notice of Motion respecting truck side guards to the City Manager for a report to the appropriate Standing Committee.

At its meeting on May 3, 2006, the Works Committee requested the General Manager of Transportation Services to report to the June 7, 2006 meeting of the Works Committee on the process by which the City can retrofit large trucks in its fleet with side guards. In the absence of action by Transport Canada on side guard regulations, it was felt that the City could show leadership by equipping its fleet trucks with side guards.

Comments:

1. Collisions Involving Large Trucks with Pedestrians and Cyclists

For the five year period 2001-2005, an average of 1,049 cyclists were injured annually in collisions with motor vehicles. Large trucks were involved in about ten of these cyclist injury collisions per year. During this same period there were eight cyclist fatalities, including three fatal collisions involving trucks (see TABLE 1). The most recent five cyclist fatalities, three in 2005 and two in 2006, have involved collisions with trucks. In addition to cyclist fatalities, the Toronto Bicycle/Motor Vehicle Collision Study (2003) found that non-fatal collisions with trucks tend to cause more serious injuries to cyclists than collisions with other vehicles.

TABLE 1: Cyclist Injuries and Fatalities, 2001-2005

Year	Total Cyclist Injuries	Truck Involved Cyclist Injuries	Total Cyclist Fatalities	Truck Involved Cyclist Fatalities
2001	1,105	14	0	0
2002	1,099	8	2	0
2003	1,013	3	1	0
2004	1,005	11	2	0
2005	1,023	13	3	3
Annual Avg.	1,049	9.8	1.6	0.6

For the five year period 2001-2005, an average of 2,279 pedestrians were injured annually in collisions with motor-vehicles. Large trucks were involved in about one percent of these pedestrian injury collisions. During this same period there were, on average, 36 pedestrian fatalities annually, including one fatality per year involving a large truck (see TABLE 2).

TABLE 2: Pedestrian Injuries and Fatalities, 2001-2005

Year	Total Pedestrian Injuries	Truck Involved Pedestrian Injuries	Total Pedestrian Fatalities	Truck Involved Pedestrian Fatalities
2001	2,455	22	32	1
2002	2,397	16	50	1
2003	2,326	16	43	1
2004	2,102	23	28	0
2005	2,113	37	29	2
Annual Avg.	2,279	22.8	36.4	1

During the same five year period 2001-2005, large trucks in the City’s fleet were involved in two collisions involving pedestrians and two collisions involving cyclists. There were no pedestrian or cyclist fatalities involving the City’s fleet vehicles during that period.

## 2. Collisions with Large Trucks Often Result in Severe Injuries for Pedestrians and Cyclists

All road users are exposed to a potentially greater impact in a collision with a large truck due to the vehicle’s mass. However, unprotected road users are exposed to significant injury risk even at slow speeds, because they can be knocked down and fall under the side of the vehicle or trailer.

In this report large trucks include tractor-trailers, dump trucks, car-carriers, tank trucks, flat-bed trucks and various other large trucks which require a class “A” or “D” license to operate (does not include smaller vehicles such as pick-up trucks and cube vans). These large trucks have in common the following design and operating characteristics which expose pedestrians and cyclists to increased risk of a collision and severe injuries:

- a) a high truck or trailer chassis and the area in front of the rear wheels is open;
- b) there are large blind spots on all sides of the vehicle, especially on the right side; and
- c) due to the vehicle's length, the driver must pull out from the curb to turn right.

Cyclists are more exposed than pedestrians to collisions with the side of a large truck because cyclists operate on the road, sharing the curb lane with motor vehicles. If any part of the cyclist or bicycle makes contact with the side of the truck or trailer, the cyclist is at risk of falling under the side of the vehicle and being caught by the wheels. Cyclists are particularly at risk when they attempt to pass a truck on the right or when they are passed by an overtaking truck. If the cyclist is positioned between a truck and the curb they are likely to be in the truck's blind spot and therefore invisible to the driver. Because of the truck's size and the engine noise inside the driver's cabin, the driver is unlikely to hear or feel the impact of a pedestrian or cyclist who has been struck by the side of the truck and fallen under the vehicle. Pedestrians standing on the corner are at risk of being knocked down and run over when a large truck is turning right because the truck or trailer's rear wheels may track over the curb. These types of collisions, with the side of a large truck or trailer, often result in severe injuries or fatalities for pedestrians and cyclists.

### 3. Preventing Truck Collisions with Pedestrians and Cyclists

An effective injury reduction strategy must focus first on preventing collisions and secondarily on reducing the severity of injuries resulting from collisions. Strategies to prevent collisions generally focus on engineering, awareness, education and training of drivers and cyclists.

#### City Fleet Driver Training

All City drivers are screened for their driving history and trained and tested (both written and practical) by Fleet Services before being permitted to operate City vehicles. Over the past several years, Fleet Services safety staff have worked closely with the City Planning Division bicycle safety staff to develop curriculum for driver training courses. As a result, the Fleet Services Defensive Driving Courses and Professional Driver Improvement Courses include bicycle and pedestrian awareness components and all truck drivers and trailer towers are issued with bulletins about safely sharing the road with cyclists. Part of the hands-on training course to upgrade to a truck driver includes instruction on sharing the road with cyclists, with specific attention to passing cyclists safely.

Initial driver training is followed up with continuous improvement and upgrade opportunities. For example, complaints from the public about a City driver are reviewed by Fleet Services safety staff/driver trainers. All collisions are reviewed by Fleet safety staff, and all bicycle and pedestrian incidents are taken to the Collision Review Committee. Defensive Driving Courses are required following the first preventable collision. The review may also determine that a driver warrants additional remedial training dealing specifically with cyclist and/or pedestrian needs.

## Cyclist Training/Public Education

The City Planning Division, Transportation Planning Section, has responsibility for the City's bicycle safety and education programs. Truck drivers, motorists, cyclists and pedestrians all have their own unique perspective on road safety. City programs seek to broaden each group's understanding of the inherent limitations and challenges of every mode of transportation in order to increase safety. Transportation Planning staff coordinate several programs which focus on or include a truck-bicycle safety component.

Since 1997, Fleet Services and Transportation Planning have organized media events to raise awareness of how to share the road safely with trucks. At these events, people are invited to sit in the driver's seat of a large truck. A Fleet Services driver trainer provides information from the driver's perspective, while cyclists ride around the truck to demonstrate how difficult it is for a driver to see cyclists in the blind spots around a truck. This program has run every year since 1997 and this year Truck Demonstrations will be part of the Bike to Work Breakfast at the following Civic Centres: Tuesday, May 30th at Etobicoke Civic Centre; Thursday, June 1st at Scarborough Civic Centre; and Friday, June 2nd at East York Civic Centre. Cycling Ambassadors receive training on truck-bicycle safety and that message is communicated at the many public events that the Cycling Ambassadors attend each summer.

CAN-BIKE courses offers hands-on training for cyclists aged nine and older through the Parks, Forestry and Recreation Division. Cycling safely around trucks is taught in both the classroom and on-road sessions of the CAN-BIKE courses. This year, the 2006 CAN-BIKE pamphlet contains a safety panel with information on truck-bicycle safety and is being distributed to every child in grade four in the Toronto District School Board and the Toronto Catholic District School Board.

Safety tips on sharing the road with trucks are also delivered to cyclists and to over 100 Bicycle User Groups by a variety of means, including the City website and the Cyclometer Newsletter, which is emailed to over 3,000 cyclists every month. In addition, the Toronto Cycling Map, distributed to 100,000 cyclists every year features many safety tips, including tips for cycling around trucks.

Transportation Planning staff also work with the Road Safety Educators' Association (comprised of road safety instructors/trainers), TTC safety trainers and with the Toronto Area Safety Coalition to encourage all driver trainers to include content on sharing the road safely with cyclists in their training programs.

The Transportation Services Division is participating, together with several other Canadian municipalities, in a Transportation Association of Canada (TAC) study on Safe Accommodation of Vulnerable Road Users and Large Commercial Vehicles. The purpose of the study is to investigate these collisions in different Canadian cities to better understand the characteristics of the collisions. The results of this initial investigation will lead to the development of recommended collision prevention strategies which may include engineering, road design, education, training and vehicle design. The study is just getting underway and is anticipated to be completed in two years.

#### 4. Potential for Side Guards to Reduce Injury Severity for Pedestrians and Cyclists

Side guards have been required on some large commercial vehicles in the United Kingdom (U.K.) and in Europe since the 1980s, in response to cycling and pedestrian fatalities involving large commercial vehicles in urban areas. Side guards are intended to prevent unprotected road users (pedestrians, cyclists and motorcyclists) from falling under the side of a vehicle and being caught by the wheels.

City of Toronto Fleet large trucks were involved in four collisions with pedestrians and cyclists in the past five years (see TABLE 3). Side guards would not have provided any benefit in two of these collisions. In one collision the cyclist rear-ended the truck and in another, the pedestrian was struck by the front of the truck. In the other two collisions it is not clear that side guards would have reduced the severity of injuries. Both of these collisions resulted in minor injuries. One collision involved a cyclist side-wiped by a truck and the other involved a pedestrian struck by a right-turning truck.

TABLE 3: City Fleet – Large Truck Collisions with Pedestrians and Cyclists, 2001-2005

<b>Year</b>	<b>Involved</b>	<b>Truck Type</b>	<b>Accident Type</b>	<b>Impact Area</b>
2001	Cyclist	Dump Truck	Cyclist rear-ends truck	Rear
2001	Pedestrian	Side Loader	Right Turn	Right Side
2002	Cyclist	Dump Truck	Side Swipe	Right Side
2003	Pedestrian	Side Loader	Right Turn	Front

The City of Toronto fleet includes 1,070 mid-size to large trucks. The majority of these trucks are garbage trucks (356) and dump trucks (423). The remaining trucks include utility trucks (56), tractor-trailers (50), crane trucks (40), aerial trucks (26) and street flushers (19).

The U.K. truck side guard legislation, implemented in the early 1980s, exempted several types of trucks, such as dump trucks, garbage trucks and side loading trucks, to name a few. The European side guard regulations, adopted in 1988, set out the requirements for different types of “goods vehicles” and trailers. It is not clear at this time which types of trucks in the City’s fleet would be included if side guard regulations, similar to the European model, were adopted in Canada. However, in Europe it is the responsibility of vehicle manufacturers to demonstrate that their vehicles comply with the side guard regulations and to make application for vehicle approval.

Fleet Services staff are not aware of protective side guard products available for purchase from North American suppliers. In the absence of a commercially available product, the City of Toronto would need to design and build its own side guards or contract out the design. In order to develop an effective design that provides side protection for pedestrians and cyclists in a collision, the design should be tested and evaluated. Each truck type may require a different design. In addition to the objective of protecting pedestrians and cyclists, side guards must also be designed to enable convenient access to the underside of the vehicle for daily pre-trip inspections and routine maintenance.

Given their excellent safety record with respect to collisions involving large trucks, Fleet Services has advised that it is difficult to justify the expense of designing, testing and installing side guards on City of Toronto trucks. Following the European approach, it would be more effective if national standards were developed for side guards for different types of trucks. Therefore, it is recommended that City Council reiterate its request that Transport Canada develop regulations and design standards for side guards for the various truck types.

This report was prepared in consultation with the Fleet Services Division and City Planning Division.

Conclusions:

Over the past several years, Fleet Services and the City Planning Division staff have developed programs and materials for truck drivers and cyclists on safely sharing the road with cyclists/trucks. Given their excellent truck safety record, Fleet Services has advised that it is difficult to justify the expense of equipping City trucks with side guards. It would be far more effective if national design standards and regulations were developed for side guards for the different truck types. Therefore, it is recommended that City Council reiterate its request to Transport Canada that they develop national design standards and regulations for side guards on large trucks. Fleet Services and Transportation Planning bicycle safety staff will continue to develop and deliver driver and cyclist education programs to prevent collisions.

Contacts:

Daniel Egan  
Manager, Pedestrian and Cycling Infrastructure  
Transportation Services Division  
Tel: 416-392-9065  
Fax: 416-392-4808  
Email: [degan@toronto.ca](mailto:degan@toronto.ca)

Gary Welsh, P. Eng.  
General Manager, Transportation Services

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