CASE STUDY

City of Toronto Transportation Services maintains the transportation infrastructure including roads, bridges, sidewalks and boulevards for over 2.8 million residents. **The division is committed to the Vision Zero initiative of eliminating pedestrian road fatalities and serious injury.**

City of Toronto Curb Radius Reduction Pedestrian Safety Study

Challenge: How to Validate Impact of Curb Radius Reduction on Pedestrian Safety

The City of Toronto pedestrian projects team focuses on designing intersections that make the city safer for their pedestrians. Intersection-specific planning studies try to improve the safety at intersections for pedestrians by physically changing the geometric designs. The team is under increasing pressure and demand from various internal and public stakeholders to quickly resolve road safety pedestrian conflict issues.

Large curb radii at intersection corners reduce pedestrian visibility and can lead to high-speed turning movements. This can lead to dangerous interactions and potentially collisions with pedestrians. The team was challenged to measure the effectiveness of an upcoming "radius reduction" curb modification at an intersection which had experienced several pedestrian-vehicle collisions which resulted in serious injuries over the past few years.

Solution: TrafxFLOW

The Toronto pedestrian projects team decided to use the **TrafxFLOW** service as their automated conflict analysis solution. Temporary cameras were installed at the Davenport Rd & Christie St intersection and an automated video data collection monitoring and analysis platform was utilized to observe vehicle turning speeds and vehicle-pedestrian near miss conflict scenarios, before and after the curb radius reduction modification occurred.

For conflict analysis, the main surrogate safety measure considered was Post Encroachment time (PEI) between pedestrians and a vehicle. Traffic videos were recorded at the intersection for 12 hours/day for three consecutive days both before and after curb radius reduction.

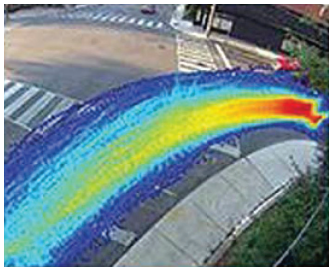
TrafxFLOW reduced the time to effectively quantify road safety conditions of report on incidences down to 72 hours.

Results: Vehicle-Pedestrian Conflicts Rates Dropped Significantly

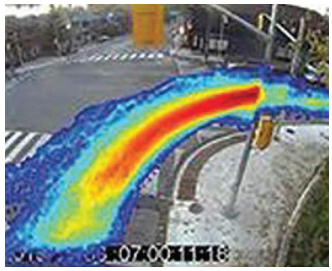
As expected, the analysis shows that the curb radius reduction at the study intersection reduced conflict rates and the speed of turning vehicles involved in a conflict. The curb radius reduction was validated to be an effective treatment for improving pedestrian safety at this intersection.

They also liked the proactive, predictive nature of monitoring and collecting data on near-misses and collisions through the conflict analysis. The group has now proceeded with another safety effectiveness study of curb radius reduction at a new intersection.

Before



After



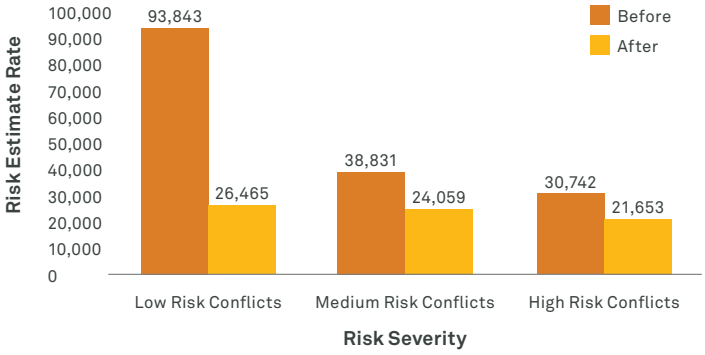
The Conflict Frequency and Risk Estimate Rates Significantly Decreased After the Curb Radius Reduction

Low Risk Conflict Rate
(PET greater than 3 seconds) **was reduced by** **72%**

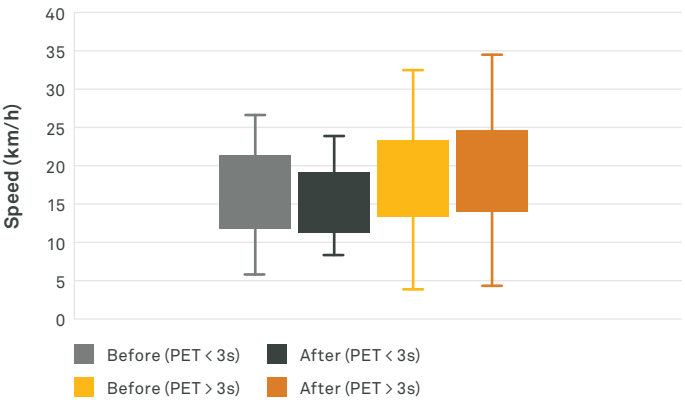
Medium Risk Conflict Rate
(PET between 1-3 seconds) **was reduced by** **38%**

High Risk Conflict Rate
(PET less than 1 seconds) **was reduced by** **30%**

Risk Estimate Rates, Before-After



Vehicle Speed Distribution



After Curb Radius Reduction, the Speed of Turning Vehicles Involved in a Conflict (With Pet Less Than or Equal 3 Seconds) Dropped:

Average Speed Reduced by	Median Speed Reduced by	85th Percentile Speed Reduced by
5.8%	**5.9%**	**7.6%**
From 16.51 to 15.55 km/h	From 15.40 to 14.49 km/h	From 16.51 to 15.55 km/h

The Toronto Pedestrian projects team were very satisfied with the quick and effective way to evaluate and validate "before and after" pedestrian safety numbers at the Davenport Rd & Christie St intersection where countermeasures have been deployed.

TrafxFLOW reduced the time to effectively quantify road safety conditions or report on incidences down to 72 hours - a big improvement to the traditional methods that relies on collision data which takes years to collect.