

PEDESTRIAN SAFETY IN QUÉBEC

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SUMMARY

Every year in Québec, approximately 3,800 pedestrians are injured or killed in a traffic accident. About one hundred people are killed, while approximately 500 others are seriously injured. The situation is particularly worrisome in Montréal, where every year pedestrians account for more than 50% of road accident deaths.

Very concerned about pedestrian safety in its territory, the Service de police de la Ville de Montréal (SPVM) organized a Provincial Round Table on Pedestrians. The Table's objective was to make recommendations for improving the road safety record by reducing the number of pedestrian deaths and injuries.

The goal of this document is first, to summarize the steps taken in Québec to improve pedestrian safety and second, to present the results of work by the Provincial Round Table on Pedestrians, particularly the proposed measures for improving pedestrian safety. These measures take into account the multidimensional nature of the pedestrian safety issue.

1 INTRODUCTION

Throughout Québec every day, approximately 10 pedestrians are the victims of the traffic accidents. With no protection from an impact with a vehicle, pedestrians are very vulnerable. That's why Québec's Highway Safety Code includes rules for ensuring that pedestrian movement is safer. And road network managers are very concerned about the safety of vulnerable users, particularly pedestrians.

Seeing and being seen is fundamental to the safety of all road users. For this to happen, the road must be shared in such a way that pedestrians and drivers are aware, careful and considerate. Awareness campaigns focus on the importance of adopting good habits at crosswalks and, in this case, ensuring that pedestrians and drivers establish eye contact.

Road design plays a decisive role in pedestrian safety. Pedestrians must travel along roads where motor vehicles usually take up the largest space. And pedestrian walkways are not laid out uniformly: the current tendency is to reconsider the space allocated for vehicles, as opposed to the 1950s, when the tendency was to give priority to motor vehicles.

The work of the Provincial Round Table on Pedestrians made it possible to assess pedestrian safety, determine various measures that have been implemented and identify possible solutions for improving pedestrian safety.

This document begins by summarizing the findings of the Provincial Round Table on Pedestrians with respect to the road safety record, road environment, road prevention, legislation, control and deterrence. It then presents activities in Québec that take pedestrian safety into account.

2 PROVINCIAL ROUND TABLE ON PEDESTRIANS

Very concerned about pedestrian safety in its territory, where pedestrians account for more than 50% of road accident deaths each year (approximately 25 pedestrians die), the Service de police de la Ville de Montréal (SPVM), organized a Provincial Round Table on Pedestrians in 2005.

The Table's objective was to make recommendations for improving the road safety record by reducing the number of pedestrian deaths and injuries. The Table was responsible for outlining all aspects of pedestrian safety in Québec, and Montréal in particular, and then listing ways to improve the situation.

The SPVM's partners in safety also participated in this Table. These partners included the ministère des Transports (MTQ), Sûreté du Québec, the Société de l'Assurance automobile du Québec, the Association des directeurs de police du Québec, the ministère de la Sécurité publique, the ministère de la Santé et des Services sociaux, the Fédération de l'âge d'or du Québec, and the Longueuil, Sherbrooke and Laval police services.

After outlining the pedestrian safety situation in Québec and describing the various steps that had already been taken to improve the situation, the members of the Provincial Round Table on Pedestrians proposed solutions that reflected the multidimensional nature of pedestrian safety.

In fact, this issue requires action in three areas: road environment, education and awareness, and legislation, sanctions and deterrence methods. This integrated road safety approach is known as the 3E (Education, Engineering and Enforcement) approach, and its aim is to resolve problems in a lasting way. Once problem areas are identified, it is possible to determine the steps that have already been taken toward the 3Es or to go even further by taking new steps.

Below are the findings of the Provincial Round Table on Pedestrians with respect to the road safety record, road environment, user awareness and control and deterrence.

3 PEDESTRIAN INJURIES AND DEATHS

In Québec, pedestrians rank second, after the occupants of cars and light trucks, in number of deaths. They comprise 13% of all road deaths [1]. Between 2000 and 2004, the Island of Montréal represented 27% of all pedestrian deaths in Québec.

Because of its large population (both pedestrians and drivers), the administrative region of Montréal is by far the area with the most pedestrian victims. Roughly five pedestrians per day suffer minor, severe or deadly injuries in an accident on the road network. On average, 25 pedestrians die every year. They comprise 44% of deaths in the entire Montréal road network.

In 2004, nearly half of the pedestrian victims (46%) were from this region, where a quarter of Québec's population resides. That's why the rate of victims in the administrative region of Montréal (90.8 victims per 100,000 inhabitants) is almost double that of the entire province (49.3 victims per 100,000 inhabitants).

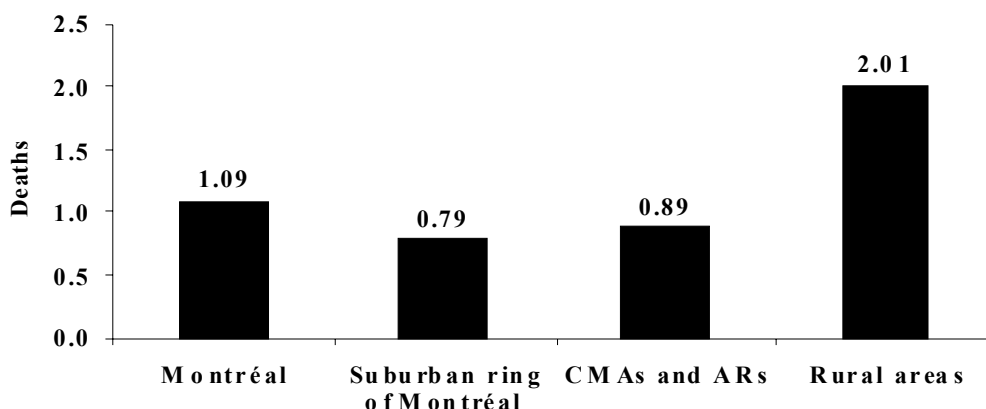
Every year in Québec, about 3,800 pedestrians are injured or killed in a traffic accident [2]. About a hundred people are killed and roughly 500 others are seriously injured. Aware of this situation, the municipalities of Québec, along with the ministère des Transports, have taken steps to improve pedestrian safety. The situation is particularly worrisome in Montréal, where every year pedestrians account for more than 50% of road accident deaths.

In the 2000-2004 period, an average of 90 pedestrians were killed every year in an accident, 514 were seriously injured and 3,198 suffered minor injuries. The number of pedestrian deaths fell 12.1% in 2004 compared to the average of the previous five years (1999-2003). Serious injuries fell 0.4%. In the administrative region of Montréal however, deaths increased 7.4%, and serious injuries rose roughly 25%.

By comparing the annual rate of pedestrian deaths per geographic area in Québec during the 2000-2004 period, one can see (Figure 1) that the death rate is higher in rural areas (2.01 deaths per 100,000 inhabitants). In Montréal, the rate is 1.09 deaths per 100,000 inhabitants.

Figure 1

Annual rate of pedestrian deaths per 100,000 inhabitants in Québec, by geographic area, for the 2000-2004 period



The *Montréal* geographic area is defined as the urban community of Montréal, Laval and the Champlain MRC. This area comprises 34% of Québec's population, while the

suburban ring of Montréal includes all other municipalities in the Census Metropolitan Area of Montréal. This is where 12% of the Québec population resides. Census Metropolitan Areas (CMAs) and Census Agglomerations (ARs) comprise 28% of the population and represent the other regions, such as Québec City, Sherbrooke or Magog and Matane. *Rural areas* represent all other municipalities in Québec. Twenty-six percent of the population reside in this area.

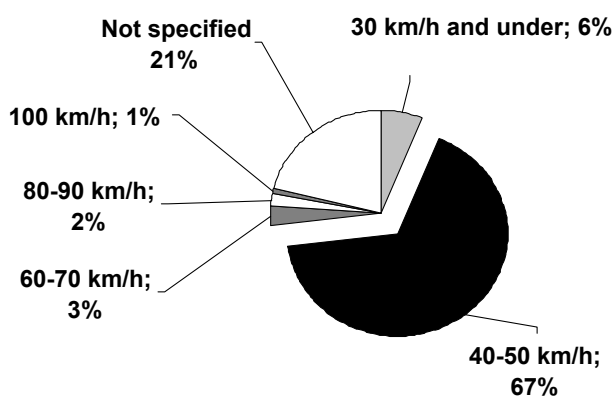
3.1 Pedestrian accidents by type of network, speed limit and surrounding area

Most accidents involving a pedestrian occur on the municipal road network (89%). Another 7% and 3% of accidents occur on the main network (routes 100 to 199) and secondary network (routes 200 to 399) respectively.

Only 1% of accidents involving a pedestrian occur on highways (routes 1 to 99), where pedestrian traffic is prohibited.

Figure 2

Accidents involving a pedestrian, by speed
Québec (2000-2004)



As Figure 2 shows, nearly 67% of accidents involving pedestrians occur in 40-50 km/h zones. Fifty-one percent of accidents involving pedestrians occur in shopping areas, 34% occur in residential areas and 5% in school zones.

3.2 Location of accidents

In Montréal, most accidents involving pedestrians occur on roadways at an intersection (47%) or between two intersections (33%). Five percent of accidents occur on the grounds of a shopping centre.

For the most part, pedestrian accidents in the administrative region of Montréal occur in densely populated areas, where walking is common and conflicts with cars are numerous. A significant number of pedestrians are injured on arterial roads (55%) and sites where travel occurs, like metro stations and commercial corridors. [3]

3.3 Pedestrian victims by month

The monthly distribution of victims [4] generally shows that the number of victims rises in October, November and December.

4 DESIGNS TO IMPROVE PEDESTRIAN SAFETY

Safety has a significant influence on walking: road users face countless dangerous situations, which lead them to feel insecure about adopting active forms of transportation such as walking. Moreover, pedestrian safety is usually an issue in urban areas, where various modes of transportation (driving, walking, biking, taking public transportation) are common.

In both the network under the MTQ's responsibility and the networks for which municipalities are responsible, pedestrian safety is always considered during road development. Network managers try to improve pedestrian safety by adopting road designs that are safe for pedestrians. Particular attention is placed on intersections and school zones.

The road environment can be designed exclusively for motor vehicle traffic, such as highways, where pedestrian traffic is prohibited. Or it can be reserved exclusively for pedestrians, such as streets and pedestrian walkways, where motor vehicle traffic is limited or prohibited. In both cases, the rate of accidents involving pedestrians is usually very low. However, with the exception of parks, few spaces are reserved exclusively for pedestrians, and they are usually located in the public areas of Québec's cities.

Given that pedestrians are very vulnerable to motor vehicles, pedestrian safety in road corridors depends on public roads being developed in a way that allows pedestrians and motor vehicles to coexist, particularly by managing conflicts between these two modes of transportation.

All obstacles to visibility must be eliminated. Pedestrians must be able to see and be seen by drivers. Extending sidewalks would have the double effect of improving driver-pedestrian visibility and reducing the distance that must be crossed. Adding refuge islands and centre strips, and reducing the width of lanes would also help reduce crossings. Walkways must be continuous. This means that all obstacles of a certain size must be removed from sidewalks, that crossings should be properly located, and that sidewalks should incorporate dropped curbs.

In urban areas, road environments for pedestrians are not uniform within the same territory. Road infrastructure was built at different times, and knowledge about pedestrian safety has increased over the years. In the 1950s, many existing city roads were widened to give priority to motor vehicle traffic and new roads were designed to be generously sized for cars. Today, the tendency is to reconsider lane space to find a better balance for all uses (walking, biking, driving, taking public transportation). Every year, many road corridors are redeveloped, and known techniques for reducing the risk of accidents involving pedestrians are usually incorporated.

Even sites that have recently been redeveloped are not uniformly designed or do not incorporate known measures for further reducing risks. In many Québec municipalities, road corridors frequently lack sidewalks or lack continuous sidewalks, streets are unlit, while crossings in built-up areas have not been redesigned and promote high-speed motor

vehicle traffic. Technical or financial considerations may explain these choices. When designing or redesigning road corridors, it seems that traffic and pedestrian safety, while thought of, are not exhaustively considered.

Preferably, a large portion of municipal road infrastructure should be renovated so that the road environment—in conjunction with education and enforcement—helps significantly reduce the number of road accidents involving pedestrians in Québec. Given that it will require a major investment, such a strategy is not feasible in the short term. Therefore, any new development or remedial work on roadways must systematically incorporate more effective measures for reducing the risk of accidents involving pedestrians. Particular focus must be placed on:

- Commercial streets and arterial roads
- Intersections
- Downtown and centres of attraction
- Residential neighbourhoods
- Public transportation infrastructure: bus stops, terminals, and metro and train stations

Designs that put pedestrian safety first would primarily affect:

- Speed limits for motor vehicle traffic—at 50 km/hr, a pedestrian has a 50% chance of surviving an impact, but a 90% chance of survival at 30 km/h
- Traffic volume—reducing traffic volume helps reduce exposure to risk
- The number of conflict points
- Conflict management at intersections
- Pedestrian and driver expectations—cohesion between developments and environment, improving visibility in conflict areas, understanding messages
- Visibility and readability of developments

Among these elements are:

- Crosswalks
- Developments along road corridors
- Developments at intersections
- Developments in sensitive areas (steps to reduce traffic)
- Other developments

5 EDUCATION AND AWARENESS

The Société de l'assurance automobile du Québec (SAAQ) is responsible for conducting prevention and awareness activities that will impact user behaviour. Every year, the SAAQ takes various steps to help make pedestrians and motorists more aware of road safety.

Since the mid-1980s, the SAAQ has been making pedestrians aware of road safety rules. In the early 1990s, following an agreement with the ministère de l'Éducation, the SAAQ went to elementary schools and handed out promotional kits. In 1994-95, it launched a campaign targeting adult pedestrians. And in the years that followed, the SAAQ launched regional campaigns targeting Montréal and Québec City.

Statistics show that a large proportion of accidents involving pedestrians occur in areas where the speed limit is 50 km/h or less. The SAAQ has therefore concentrated on awareness campaigns targeted at pedestrians in urban areas, where the chance of improving the safety record is highest. That's why, for several years now, the message has focused on how important it is for pedestrians to cross at intersections.

In 2001 and 2002, the campaigns were intended to raise awareness among pedestrians and motorists by reminding them both to be more vigilant.

In 2003, the "I put pedestrians first" campaign coincided with the right turn on red coming into effect.

In 2004, the "On the way home" campaign focused only on trips made on foot and targeted children 5 to 14. It was re-launched in 2005 and focused on three forms of transportation (walking, biking and taking the school bus).

Awareness campaigns are an essential part of a larger road safety strategy. They are the aspects of education/enforcement.

6 ENFORCEMENT

Police enforcement is a fundamental component of road safety strategy. In Québec, police officers often adopt prevention and enforcement strategies for pedestrian safety. The methods used depend on the goal of the intervention. For instance, to teach drivers and pedestrians about safety rules to help them adopt good behaviour, police officers choose prevention activities such as:

- Holding awareness meetings with target clients
- Conducting prevention activities at intersections or problem areas
- Handing out flyers and meeting users
- Printing press releases in local and national newspapers

After analyzing the road safety intervention records, we are forced to conclude that pedestrian safety is not firmly established in Québec police culture. Rarely is it among the most important daily activities of patrol officers. It is difficult to enforce regulations when there is no social consensus about pedestrian safety.

When police officers deal with pedestrians, they have to contend with large spaces that allow pedestrians to cross almost anywhere. It becomes very difficult for a police officer to get pedestrians to cross at an intersection when the distance between the intersections is considerable and no physical obstacles are stopping the pedestrians from crossing illegally. In some areas, road markings and signs are not always adequate.

Winter conditions reduce the effectiveness of road markings. When the pavement is covered with snow, markings are less visible, so pedestrians are less likely to use crosswalks. They prefer to cross between two intersections, where they say they are better protected.

Despite many constraints to improving pedestrian safety, police officers still intervene in various ways. However, the problem is bigger than the enforcement efforts that have been made.

7 GUIDE TO ESTABLISHING ROUTES THAT PROMOTE SAFE AND ACTIVE FORMS OF TRANSPORTATION TO SCHOOL

The Guide to establishing routes that promote safe and active forms of transportation to school is currently being prepared. This technical guide for municipalities will help them establish routes that promote safer trips and active forms of transportation to elementary schools.

School children are more vulnerable than other road users:

- They are smaller and their field of vision is limited
- They have trouble assessing distances and determining the origin of noises
- They are more distracted and impulsive
- They are more often victims of road accidents

In 2005, 3,923 pedestrians were killed or injured in a traffic accident in Québec [5], and 576 of them were children under 14.

While working with others in the area, as needed, to identify, analyze and reengineer routes that will help ensure trips to elementary schools are safe and active forms of transportation are adopted, the guide will be a tool all municipalities in Québec can use.

Where the goal is to promote active forms of transportation, awareness campaigns should be launched to help people rediscover the potential of walking and biking.

The guide will present a technique for identifying and choosing school routes. The selection should take into account the physical, human, and road environments. The first environment characterizes how space is occupied, the second considers the presence of people like crossing guards along the route, and the third refers to traffic and resulting accidents.

Young school children are unaware of risks, so dangers and obstacles to active forms of transportation must be identified. This operation, combined with a diagnosis of road safety, identifies potential routes and solutions that could be adopted for each one. Accounting for existing conflicts, speeds, and visibility is crucial.

The guide will also emphasize establishing this route. Putting this project into effect will require joint effort. Education, information, awareness, promotion and assessment are crucial to the success of identified routes.

8 RIGHT TURNS ON RED

On April 13, 2003, right turns on red were permitted throughout Québec, except on the Island of Montréal. Pilot projects had been taking place in five Québec regions since January 2001. Throughout this period, the pilot projects were assessed: wait and crossing times were evaluated, accidents were analyzed, behaviour was studied, and surveys were conducted.

The MTQ and its partners committed to safely implementing the right turns on red lights legislation. For this reason, various aspects of the manoeuvre were monitored in the year after it was permitted. Data on accidents, offences, and behaviour changes were regularly

monitored to ensure that allowing this new manoeuvre would not adversely affect road safety.

When right-hand turns on red lights came into effect, the MTQ was concerned about pedestrian safety. It therefore:

- Published the first Québec standards on installing countdown pedestrian signals to help facilitate pedestrian crossings and harmonize the type of equipment installed by road network managers
- Published the first Québec standards on installing audible pedestrian signals to help make crossing easier for visually impaired people and harmonize the types of equipment installed by road network managers
- Granted \$2.5 million in financial aid to municipalities through the Société Infrastructure-Transport to purchase equipment such as countdown pedestrian signals or audible pedestrian signals for the visually impaired

Permitting right turns on red lights in Québec allowed for a review of equipment—like existing pedestrian signals—to ensure that it met pedestrian safety needs.

Allowing right turns on red lights has evidently resulted in an increased number of accidents at signalized intersections, because it introduced a movement that was not allowed at intersections before. However, a review of accidents was conducted after right turns on red were permitted, and it was determined that the proportion of accidents linked to right turns on red lights is low when compared to other types of accidents that occur on the road network. In fact, they represent 0.18% (or 18 accidents per 10,000) of all accidents during the same period [6]. This percentage is comparable to that of other North American road administrations, where accidents related to right turns on red lights also account for fewer than 1% of all accidents.

9 CITY OF MONTRÉAL PEDESTRIAN CHARTER

While preparing its transportation plan, the city of Montréal developed a pedestrian charter that makes pedestrians a top priority. With this charter, which is currently in the process of being adopted, the municipal administration wants to recognize that pedestrians are of prime importance in urban areas and acknowledge that pedestrians need to adopt safe behaviour that respects the Highway Safety Code. Of course, no measure will be effective if pedestrians don't take their share of responsibility and continue, for the most part, not to respect the Highway Safety Code. The charter also calls for joint commitment between the city and its partners, including the police service and the city's citizens.

10 NEXT STEPS

The work of the Provincial Round Table on Pedestrians has allowed various measures to be targeted. The goal of these measures is to:

- Develop a culture of respect and courtesy toward pedestrians to increase their safety
- Strengthen enforcement of the Highway Safety Code
- Clarify and simplify traffic rules that apply to pedestrians
- Ensure infrastructure and signs are of good quality
- Promote public transportation and active transportation to improve public health

- Take the steps needed to ensure that all road safety actors are taking action

Various areas of action are affected by these goals. To improve pedestrian safety and reduce the number of accidents involving pedestrians, a three-pronged strategy focusing on education, engineering and enforcement needs to be implemented.

11 CONCLUSION

Over the last few years, Québec municipalities and the MTQ have tried to implement various measures to improve pedestrian safety. Nonetheless, every year, about 3,800 pedestrians are injured or killed in a traffic accident. The situation is particularly worrisome in Montréal, where every year pedestrians account for more than 50% of road accident deaths.

To better understand the issue of pedestrian safety, the safety record should be analyzed with respect to changes in the practice of walking, an activity that has health benefits. In Québec, walking has become less popular, so the consistent number of pedestrian injuries can hardly be considered a success.

By a) offering safe conditions for travelling, while harmoniously integrating transportation networks within urban areas and b) placing the priority on pedestrians when designing and redesigning the public environment, road network managers will help improve pedestrian safety while promoting walking as a form of transportation.

Any steps taken to successfully reduce the number of pedestrian deaths and injuries must be part of a larger Education, Engineering and Enforcement strategy.

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