

Factsheet 2

Urban arteries and boulevards: sharing the road

Included in this factsheet:

- 1 Health issues linked to the development of major arteries in an urban setting,
- 2 Security risks to pedestrians and their root causes,
- 3 Preferred solutions to improve security and road-sharing between motorists and pedestrians,
- 4 Some inspirational examples.

Décarie Boulevard, Montréal, June 2012. Credit: MUEC

Major arteries are densely populated urban areas which feature heavy traffic, particularly public transportation and active transportation. Due to high volume and speed, motor vehicle traffic moving along these arteries affects air quality, noise levels, ambient temperature and pedestrian safety. Effective strategies to minimize these impacts and foster greater pedestrian comfort, as well as enhanced road-sharing with other users, include a reduction in the volume of motor vehicle traffic, a more equitable sharing of the road among its many users, and traffic-calming tactics. Such strategies benefit everyone since we are all pedestrians at various times!

Réseau
Quartiers
verts



Active
Neighbourhoods
Canada



Sustainable Calgary



toronto centre for
active transportation

The achievement of this project was made possible by a financial contribution from the Public Health Agency of Canada.

The views expressed here do not necessarily reflect the official position of the Public Health Agency of Canada

Urban arteries: true living spaces

Urban arteries criss-cross a number of densely-populated areas and are frequented by all users including pedestrians, cyclists, public transit users, and car/truck drivers. In addition to family homes, a number of popular destinations are located along these arteries, including businesses, bus stops and subway stations, schools, office buildings, hospitals, libraries, and others.

However, the past few decades have seen a continuous increase in the number of motor vehicles travelling along these roads, which has transformed common perceptions of these arteries. Today, they are mainly viewed as transit routes whose primary function is to ensure the fluid movement of motor vehicle traffic, and where today, pedestrians, cyclists and other users must struggle to stake their claim. Moreover, the vast majority of collisions involving pedestrians occur along these arteries^{1,2,3} even though they comprise a relatively modest portion of the overall road network.

DEFINITION OF AN ARTERY, ACCORDING TO THE MINISTÈRE DES TRANSPORTS DU QUÉBEC⁴

A roadway whose overriding purpose is the movement of traffic over long distances. Arteries serve to link the various neighbourhoods within a municipality. The roadway frequently features four lanes of traffic or more, and intersections are regulated by traffic lights. Main bus routes are located along these roads.

CROSSING TIME : NOT EVERYONE STANDS EQUAL

The elderly, those with reduced mobility and young children are particularly vulnerable in time to cross the arteries. Not only do they move more slowly, but their visual acuity and hearing can also be reduced, as can their reflexes and their ability to estimate distances.

HEALTH IMPACTS ON ADJACENT RESIDENTS AND PEDESTRIANS

- Higher concentrations of particulate matter, widely regarded as a leading cause of respiratory and cardiovascular conditions, may be found near major arteries⁵.
- These arteries and their associated motor vehicle traffic contribute to generating urban heat islands, which may cause discomfort, fatigue, respiratory problems, etc.⁶
- Ambient noise levels recorded beside major arteries exceed 55 decibels, the limit at which auditory discomfort is noted, and in some cases may reach nearly 70 decibels⁷.
- The presence of urban arteries, which are generally concentrated in low-income neighbourhoods, may result in heightened social and health inequality.

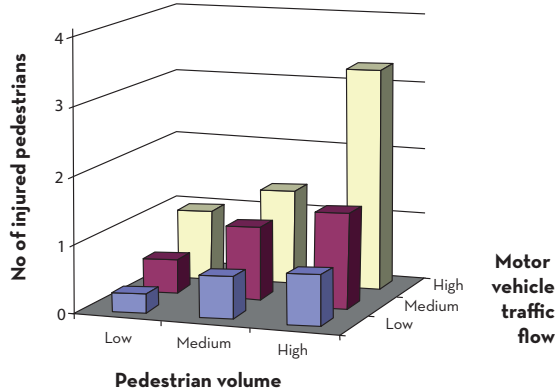
Root causes of inadequate pedestrian safety, both real and perceived

Volume of motor vehicle traffic: the risk of a collision between a pedestrian and a motor vehicle increases with higher pedestrian and motor vehicle traffic volume, which is the case along major arteries.

Motor vehicle speed: on the one hand, collision risk increases as a function of motor vehicle speed, which potentially reduces a driver's peripheral field of vision and lengthens reaction time and braking distance. On the other hand, impact force rises significantly as speed increases, heightening both the severity of pedestrian injury and the risk of death.

Figure 1 - Number of injured pedestrians, based on the volume of motor vehicle/pedestrian traffic in central Montréal neighbourhoods

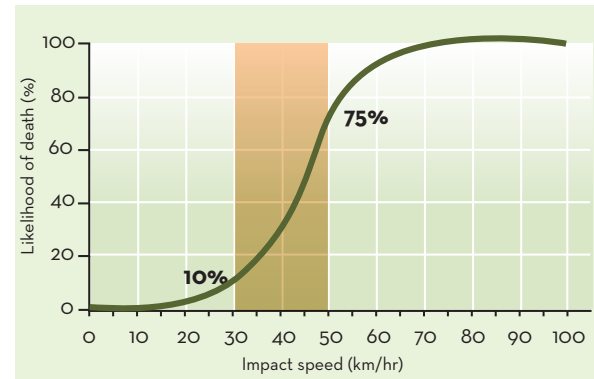
(524 intersections; Montréal)



Data: City of Montréal

Analysis: P. Morency, Office of the Director of Public Health, Montréal

Figure 2 - Likelihood of pedestrian death following a collision with a motor vehicle, based on impact speed



Source : MTQ (2011)⁸

Road layout: numerous road features can affect pedestrian security. These include the number and width of traffic lanes, the time required to cross intersections or reach medians, pre-set pedestrian crossing times at traffic lights, the presence of sidewalks or other pedestrian throughways, visibility levels at intersections, and the complexity of potential motor vehicle movements (right turn, left turn, straight through), among other factors.

In recent years, North American cities are increasingly re-examining their development philosophy for major arteries within their municipalities, with a view to better serving all road users. No longer regarded simply as channels for the flow of motor vehicle traffic, arteries are now considered true urban living spaces.

Preferred solutions

A number of strategies may be evaluated to reduce threats to pedestrian safety along urban arteries and improve all users' ability to share the road:

- Lowering the volume of motor vehicle traffic by offering alternative options: investing in public transit, developing ride-sharing initiatives, providing incentives for car pooling, developing bicycle lanes, widening sidewalks, etc.;
- Calming traffic to decrease speed: reducing the width of traffic lanes;
- Redeveloping intersections and median crossings: clear signage for pedestrian crossings, parking restrictions near intersections to improve visibility, installation of mid-crossing shelters (median strips, pedestrian refuge), traffic lights with digital countdowns and appropriately long pedestrian crossing times, etc.

Reimagining major arteries to enhance road-sharing

Laurentian Boulevard and Lachapelle Street, Montréal, Québec

A slimmed-down version of two Montréal-area arteries?

The City of Montréal took advantage of construction work on a nearby aqueduct and sewer system to reassess the configurations of Laurentian Boulevard and Lachapelle Street, two parallel arteries located in the Ahuntsic-Cartierville borough, with a view to facilitating movements for all users, enhancing pedestrian and cyclist security, and improving the overall urban landscape as well as the pedestrian experience along these two roads.

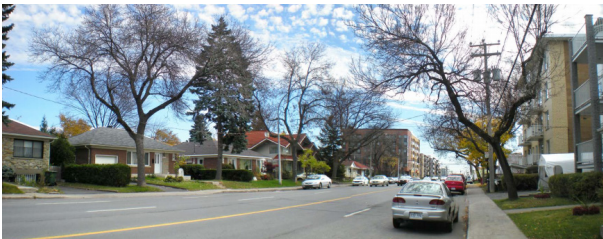
Existing features of these roadways:

- Mixed residential and commercial neighbourhood (two seniors' residences and several daycares located along Laurentian Blvd.);
- Two-way vehicle traffic;

Existing Laurentien Boulevard



Existing Lachapelle Street



- A crossing distance of approximately 20 metres;
- Narrow sidewalks (along one side of Laurentian Blvd. only);
- A reserved bus lane along Laurentian Blvd. only;
- A dearth of trees along Laurentian Blvd., which generates a significant heat island.

The City elected to transform both roads into one-way streets. This option enabled the City to reduce the number of traffic lanes from five (and even six in some areas along Laurentian Blvd.) to four, including a reserved lane during rush hour. It also widened the sidewalks and decreased the pedestrian crossing time while ensuring an equivalent level of service for motor vehicle traffic. Over 400 trees as well as many other plants will be planted along the three kilometres of the redeveloped roadway.

Proposed Laurentien Boulevard



Proposed Lachapelle Street



Source: redesigning of Laurentien boulevard and Lachapelle street, between Louisbourg Street and Lachapelle bridge, public presentation, June 22, 2015 - http://ville.montreal.qc.ca/portal/page?_pageid=7957142079273&_dad=portal&_schema=PORTAL.

LINK TO TOOLKIT



<http://www.ecologieurbaine.net/fr/transformer-sa-ville>

LINK TO UP GUIDE



<http://www.ecologieurbaine.net/en/documentation-en/technical-guides/79-urbanplanningguide>

SOURCES

- 1 Morency, Patrick (2012). *Aménagements des artères... Pour augmenter ou réduire le risque de blessures ?* Conference presented during the Forum URBA 2015, September 19. In French only.
- 2 Toronto Public Health (2015). *Pedestrian and Cyclist Safety in Toronto*.
- 3 Ville de Vancouver (2012). *Pedestrian Safety Study*. Final report.
- 4 Ministère des Transports du Québec (2015). *Op. cit.*
- 5 Reeves, François (2011). *Planète Cœur. Santé cardiaque et environnement*. Éditions du CHU Sainte-Justine and Éditions MultiMondes.
- 6 Institut national de santé publique du Québec [Québec Public Health Expertise And Reference Centre] (2009). *Mesures de lutte aux îlots de chaleur urbains*. Literature review. In French only.
- 7 Agence de la santé et des services sociaux de Montréal (2014). *Avis de santé publique sur le bruit du transport et ses impacts potentiels sur la santé des Montréalais*. In French only.
- 8 Ministère des Transports du Québec (2011). *La modération de la circulation*. Technical spec sheet. Office of the Director of Transportation Safety. In French only.
- 9 City of Montréal (2015). *Réaménagement du boulevard Laurentien et de la rue Lachapelle entre la rue Louisbourg et le pont Lachapelle*. Public information session, June 22. In French only.