A 30-km/h Speed Limit on Local Streets

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Briefing Note

For up-to-date knowledge relating to healthy public policy

This document is part of a series of briefing notes documenting innovative municipal norms that have the potential to help create environments promoting safe active transportation by changing the design or organization of public roadway networks.[1]

In this short paper we will discuss the reduction of speed limits on local streets to 30 km/h. We will focus our attention particularly on the benefits of such speed limits for promoting safe active travel, as well as on implementation issues.

Model formulation for this norm

The speed limit on all local streets of this sector in city X shall be 30 km/h.

Alternate formulation

The speed limit on local streets bordering parks or schools, and on local streets harbouring designated bike routes, shall be 30 km/h.

Normative context

Ever since the adoption of provincial highway codes in the mid-20th century, the default and most widespread speed norm for local streets in Canada is 50 km/h. Introducing lower speed limits is not unprecedented, as we shall see below, but there is great potential for scaling up the implementation of the 30-km/h norm and its more limited, alternate formulation in Canadian cities.

Anticipated benefits

Reducing the speed limit to 30 km/h on local streets is generally done to mitigate the impacts of motorized traffic, thereby improving quality of life for local residents and the conditions for active transportation on these streets. Regarding active transportation specifically, a reduction in motor vehicle speeds is anticipated to increase (1) the safety and (2) the user-friendliness of trips, thereby increasing the attractiveness of active transportation modes as options for users.

ROAD SAFETY

At 30 km/h, with the braking distance being reduced, the risk of collisions is considerably lower than the risk at 50 km/h. Moreover, the severity of collisions is also greatly reduced at this lower speed (see Figure 1). Thus, fewer and less severe collisions will result in fewer injuries and deaths.

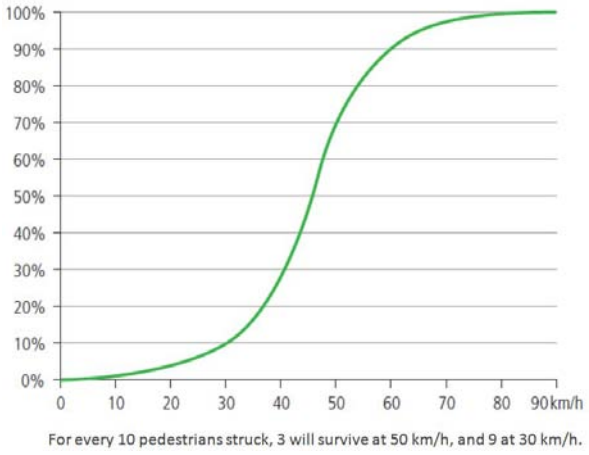

Figure 1 Speed and pedestrian survival

Pedestrians' chances of surviving a crash at 30 km/h are much higher (90%) than if they are hit at 50 km/h (30%).

Source: Adapted from Bureau de prévention des accidents, 2008.

ranging from a 700 m stretch of street to an area covering 37 km of streets implemented in London (UK) has been made. The results were published in a report (Grundy, Steinbach, Edwards, Wilkinson, & Green, 2008) and a scientific article (Grundy et al., 2009). They show that the zones resulted in significant reductions in both minor and serious injuries and in deaths for pedestrians and cyclists. The reductions were even more dramatic for youth aged 15 years and under (see Table 1). A comparison of the effectiveness of small (<3.6 km of road) and large zones (>3.6 km of road) revealed no significant difference.

[1] To learn more about this series of briefing notes, please visit: http://www.ncchpp.ca/174/news.ccnpps

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Table 1 Speed limitations and trauma reductions

Effectiveness of 20-mph (32-km/h) zones at reducing injuries and deaths in pedestrians and cyclists	Pedestrians	Cyclists
Personal injury collisions	-32.4%	-16.9%
0-15 years	-46.2%	-27.7%
Killed or seriously injured	-34.8%	-37.6%
0-15 years	-43.9%	No data.

Source of the data: Grundy et al. (2008).

ATTRACTIVENESS OF ACTIVE TRANSPORT

The level of attractiveness of active transport as an option for potential users in 30-km/h zones as compared to 50-km/h zones can be understood with regards to a number of indicators, but we will limit our focus to ambient noise and directness of routes.

Noise: lowering travel speeds to 30 km/h can substantially reduce the noise generated by motorized traffic. Indeed, a literature review of evaluations concerning the introduction of 30-km/h speed zones on ensembles of streets that were previously set at 50 km/h shows notable reductions of motor vehicle noise emissions. In Swedish studies, it was established that the average emissions reduction ranged from 2 to 4 dB(A) for cars and 0 to 2 dB(A) for trucks, with a supplementary reduction of 2 dB(A) for the maximum noise measure.[2] While the German studies reviewed did not distinguish between types of vehicles, they noted reductions of average noise emissions of up to 3 dB(A) with reductions in maximum noise emissions of up to 5 dB(A). The lowest reduction noted in the literature review is 0.9 dB(A) for both average and maximum noise (Desarnaulds, Monay, & Carvalho, 2004).

Cycling routes: lowering speed can be used as an opportunity to develop a municipality's cycling infrastructure, whether on a specific street (e.g., by installing bike boulevards) or across a whole area. This can shorten the length of cycling routes, considering that routes are not optimally direct when bike infrastructure is limited to arterial streets - where separated bike paths are typically implemented.[3] Indeed, it has been noted that some cities with a large modal share[4] of cycling opt for the construction of separated grade infrastructure exclusively on arterial streets where the speed limit is 50 km/h and use design speeds[5] of 30 km/h (or lower) for local streets in order to secure active transportation modes on these (Furth, 2012). Some experts have also recommended that strategy (Pucher & Buehler, 2008).

Potential disadvantages

In urban settings, travel time is only marginally determined by speed limits since it is influenced by many other factors, such as intersection management, congestion levels, weather, etc. (Archer, Fotheringham, Symmons, & Corben, 2008). Nonetheless, the potential increase in travel time for motorized vehicles remains the most controversial aspect of this norm.

Despite the fact that lower speed limits can affect travel time, it must be noted that local streets, understood from the perspective of modern traffic planning's functional classifications,[6] are intended for

[2] The A-weighted decibel or dB(A) is a unit of measurement weighted according to a filter, A, to take into account the way the human ear responds to sound frequencies (Bellefleur, 2012).

[3] Bike boulevards are local streets on which the speed limit has been set at 30 km/h (or 20 mph) and where various design options have been implemented to make utilitarian cycling safe and attractive for users: http://www.streetfilms.org/portland-or-bicycle-boulevards/

[4] The concept of modal share refers to the percentage of trips via one or another 'mode,' i.e., cycling, walking, collective transportation, car, etc. Associated with this is the concept of "modal shift," which is used in strategies aiming to increase the modal share of one or another mode – today, mostly towards active and collective transport options, away from individual motorized transport.

[5] The concept of design speed refers to the speed of motorized vehicles anticipated and selected by engineers to determine the physical features of a street. It is often not the same as the posted speed limit, which indicates the desired speed for a street. For example, it is frequent to see engineers select a 60 km/h or even higher design speed on streets where a 50 km/h speed limit is posted. The reason seems to be that a higher design speed will result in safer environment for drivers.

[6] Not all municipalities use exactly the same classification criteria. For example, some municipalities will differentiate between primary and secondary arteries. However, most have at least defined some streets as "local." Their primary function is said to be to access - to residences, for example - and vehicular traffic is expected to be low (even though many have non-explicit norms in this regard, some have determined 800 vehicles per day to be a threshold for what is acceptable).

local access and not for through transit. As such, reducing speeds on local streets can be understood as a correction of an undesirable state of affairs. Further, distances travelled on local streets are usually – and should be, according to these same traffic planning norms – relatively low, so this potential disadvantage seems rather limited; and benefits arguably outweigh the downside.

With approaches targeting all streets in a given zone (referred to as area-wide approaches), there might be concerns that motorized traffic will thereby be redirected to arterial streets which are sometimes already congested. Given that it is often lower-income residents living along arterial streets, redirecting traffic to arterials could amplify some problems for this already-compromised group. The only published evaluation of this potential effect has found no such effect on road collisions (Grundy et al., 2009).

Context of application

The 30-km/h norm can be implemented on any local street, whether it is urban, suburban or rural. As we mentioned above, it can be applied to a single street, to a section of a street, it or could be set by a city or municipality as the default speed on all local streets for some more or less extended area. It can also be used in the context of the implementation of "bike boulevards."

Precedents

In Canada, a 30-km/h speed limit on some local streets is becoming more and more of a reality in many municipalities. In Canada, there is some diversity in the extent to which these speed limits have been applied on local streets. Most municipalities that have implemented 30-km/h speed limits have done so on a relatively limited number of local streets, on street sections bordering parks or schools, or in zones that have been consecrated as "bike boulevards." A few cities provide counter examples to this norm, such as Saint-Lambert, Québec,[7] Westmount, Québec, [8] and Duncan, British Columbia.[9] In Saint-Lambert, authorities have decided that all local streets will be 30-km/h zones. In Westmount and Duncan, they rather opted for a more limited sectoral approach on their respective territories, but the 30-km/h zones still largely extend beyond school and park zones (see Figure 2 for the case of Westmount).

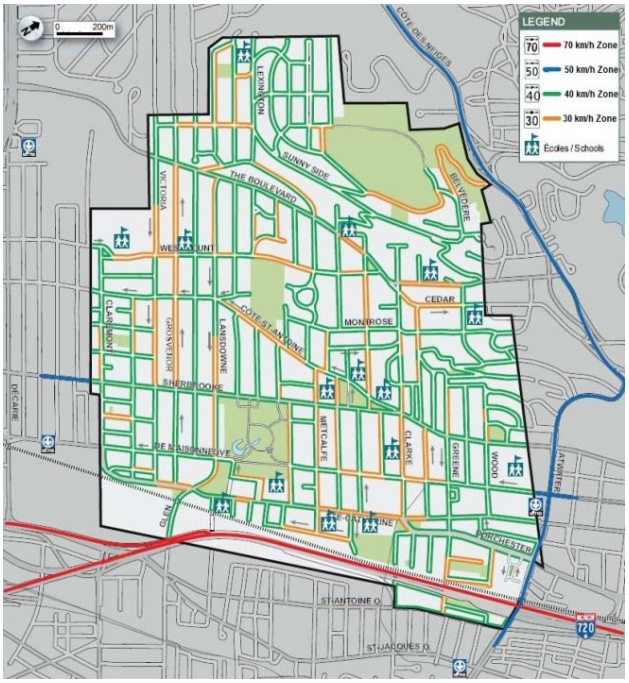

Figure 2 Speed limits on Westmount's street network

30-km/h zones (indicated in orange) are widespread on Westmount's local street network. It is interesting to see that speed has also been limited to 40 km/h (indicated in green) on the arterial network.

Source: City of Westmount, 2011.

Such an area-wide approach is more common in European cities, a notable example of which is the City of Lyon (France), home to a 67 square kilometre 30-km/h zone that covers all of the local streets in its central districts. It is also noteworthy that 30-km/h zones are found among the strategic interventions of those municipalities that have managed to shift the

Some other streets are designated as "collectors", where the street is supposed to serve the dual purpose of access and traffic distribution to the arteries, and whose volumes are expected to be somewhat higher than on local streets. Yet other streets are designated as "arteries", whose primary function is to support relatively high flows of transit traffic. These classifications determine to a large extent the relative importance accorded to the different types of users, and the security and convenience offered to them, in the design of streets.

7 http://www.umq.qc.ca/nouvelles/actualite-municipale/securite-routierea-saint-lambert-c-est-30-km-h/

8 In Westmount, this has even been accompanied by a 40-km/h speed limit on the arterial network. See Figure 2.18. Accessed online at: http://www.westmount.org/pdf_files/TrafficMasterPlan_lo2.pdf

9 City of Duncan. Accessed online at: http://www.duncan.ca/pdf/30%20km-h%20zones.pdf

modal split toward active transportation and lower the number of vehicle-kms travelled on their street networks.

Facilitators

Changes to speed limits and design speed are often brought about by pressure from local residents. While residents often complain about the traffic speeds in their local environments, this movement opens space, a political opportunity for increasing the portion of local streets with limits set at 30 km/h. In the city of Duncan, the "city provided letters to residents and property owners in the affected areas; it placed newspaper advertisement[s]; and, it provided a survey […] to solicit public input" (City of Duncan, 2012).The survey showed an approval rate of around 80% for reducing the speed limit from 50 km/h to 30 km/h in the sector and the street targeted.

Provisions in provincial highway safety codes or other regulatory documents that empower municipalities to lower the speed limit to 30 km/h, and provincial guidance for street designs appropriate to this speed limit, such as that produced by the ministère du Transport du Québec (Québec's Ministry of Transport) (Ministère du Transport du Québec, 2002), can support their development by normalizing the practice. Provincial funding for street design changes can do the same while also enabling municipalities with limited financial resources.[10]

Politically, an advantage of 30-km/h speed limits associated with specific sections of the local street network (such a school or park zones) is that they can represent a relatively "easy win," since most will agree that children constitute a vulnerable group of users who need particular protection.

Obstacles

For decades, provincial authorities have been designing streets in Canada for at least 50 km/h, and they have imposed this speed by default for all municipal streets. Further, municipalities usually have to ask their provincial transport ministries for permission to set the speed limit at 30 km/h, with Québec and British Columbia being two notable exceptions to this.

Also, many users of motorized transport modes oppose this limit because of the added travel time it could incur for them – this opposition is often echoed by elected officials representing them.

Lowering speed limits on local streets without changing their design accordingly is arguably of limited effectiveness at reducing actual speeds on local streets (Bellalite, 2011; Badeau, Souissi, & Fafard, 2012). However, changing speed norms should prompt traffic engineers to gradually change the design of those streets (i.e., to lower the design speed) to align it with appropriate safety norms. For this very reason, municipal authorities (elected officials or engineers) can also oppose such a speed limitation – they might fear the costs that these revised norms might carry. That said, integrating interventions into routine maintenance and development activities often lowers costs - and in some cases, such as building narrower street lanes, it can even become a cost-saving exercise.

Related norms or bylaws

(1) A 3-metre lane width on local streets is at the lower end of the Transportation Association of Canada (TAC) guidelines for street design; (2) "Bike boulevards" and "Zone 30" (i.e., 30-km/h zones) are normalized street design concepts that limit motor speed to 30 km/h.

Implications for practice

Introducing a 30-km/h speed limit has been shown to have positive effects on health and some of its determinants, and few, if any, trade-offs. The question remaining is where and how to apply such a norm. Nothing in the evaluative literature clearly shows that implementing a 30-km/h speed limit on all streets in a given area (following the area-wide approach) is inherently better than implementing it on specific sections of streets. One can only take into account the anticipated benefits to be realized by applying this speed limit and predict that a broader implementation will yield more benefits than a reduced one. The benefits attached to an area-wide implementation will be especially enhanced if one also considers using the opportunity to develop the municipal cycling infrastructure, since

[10] Though not specifically dedicated towards interventions aiming for a 30-km/h speed limit, the traffic-calming interventions program of the Insurance Company of British Columbia (ICBC) is a noteworthy example, both for its financial scale and its cost-benefit rationale: http://www.icbc.com/road-safety/safer-roads/invest-roads

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