

From: **"Mochrie, Paul"** <Paul.Mochrie@vancouver.ca>

To: **"Direct to Mayor and Council - DL"**

Date: 5/11/2022 2:57:14 PM

Subject: **Council Memo - RTS 14598 - Schools on Arterials Slow Zones**

Attachments: **ENG - Council Memo - RTS 14598 - Amendments to the Posted Speed Limit on Arterial and Collector Streets Adjacent to School Zones.pdf**

Dear Mayor and Council,

Please see the attached Council memo from Lon LaClaire regarding Schools on Arterials Slow Zones (RTS 14598). A short summary of the memo is as follows:

- ☐ This memo responds to the June 22nd of 2021 Council motion for staff to report back on the feasibility of a reduced speed limit posting (30 km/hr) near Stratford Hall school, CEFA Early Learning Centre and Clark Park
- ☐ The memo focuses on the potential for reduced speed limits adjacent to school zones on arterials and collectors Citywide.
- ☐ A pilot for reduced speed limits is planned at 9 schools in early 2023, as follows:
 - 30 km/hr speed limit for school zones adjacent to collectors
 - 40 km/hr speed limit for school zones adjacent to secondary arterials and arterials
 - No change to speed limits for schools zones on the MRN
 - The proposed reduced speed limits would be in effect during school hours only (8am-5pm school days)
- ☐ Next steps include a report back in Spring 2024 with the pilot results. If successful, an expansion to all remaining schools would be considered.

If you have any questions, please feel free to contact Lon LaClaire at 604-873-7336 or lon.laclaire@vancouver.ca.

Best,
Paul

Paul Mochrie (he/him)
City Manager
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The City of Vancouver acknowledges that it is situated on the unceded traditional territories of the xʷməθkʷəy̓əm (Musqueam), Skwxwú7mesh (Squamish), and səliłwətał (Tsleil-Waututh) Nations.

MEMORANDUM

May 11, 2022

TO: Mayor and Council

CC: Paul Mochrie, City Manager
Armin Amrolia, Deputy City Manager
Karen Levitt, Deputy City Manager
Katrina Leckovic, City Clerk
Lynda Graves, Administration Services Manager, City Manager's Office
Maria Pontikis, Chief Communications Officer, CEC
Anita Zaenker, Chief of Staff, Mayor's Office
Neil Monckton, Chief of Staff, Mayor's Office
Alvin Singh, Communications Director, Mayor's Office
Paul Storer, Director of Transportation
Winston Chou, Manager of Traffic Data & Management

FROM: Lon LaClaire
General Manager, Engineering Services

SUBJECT: Amendments to the Posted Speed Limit on Arterial and Collector Streets
Adjacent to School Zones

RTS #: 14598

This memorandum responds to the June 22nd of 2021 motion that Council direct staff to consult with the community and report back on the feasibility of a reduced speed limit posting (30 km/hr) and improved signage near Stratford Hall School, CEFA Early Learning Centre and Clark Park.

Staff have reviewed the potential to reduce speeds on major streets and plan to implement a pilot at nine schools, starting in early 2023, as follows:

- 30 km/hr speed limit for school zones adjacent to collectors
- 40 km/hr speed limit for school zones adjacent to secondary arterials and arterials
- No change to speed limits for schools zones on the MRN
- The proposed reduced speed limits would be in effect during school hours only (8am-5pm school days)

If successful, staff would look at expanding this to additional schools.

Background

The City of Vancouver is pursuing a Vision Zero road safety strategy. Vision Zero is a philosophy of road safety adopted by major cities around the world, which aims to eliminate traffic-related fatalities and serious injuries. Studies show that lowering vehicle speeds can significantly improve pedestrian and cyclist safety. Reducing vehicle speeds from 50 km/hr to 30 km/hr can reduce pedestrian fatality rates from 80% to 15% in the event of a collision (see Appendix A).

Currently, the blanket speed limit for local, collector and arterial streets within the City of Vancouver is set by the Province of British Columbia at 50 km/hr unless otherwise posted. Municipalities have the authority to reduce speed limits on individual streets, provided signage is posted. In Vancouver, 30 km/hr speed limits have been implemented on select local streets, specifically on bikeways, school zones (with time and day limitations) and playground zones (with time limitations). Traffic calming measures such as speed humps have been installed on some of the local streets as a physical measure to encourage compliance. On collector and arterial streets, the speed limit within school and playground zones is 50 km/hr (with a few historic exceptions). City staff have received requests from several Vancouver schools to lower the speed limit on collector and arterial streets adjacent to schools.

Section 1: Current Speeds on Collector and Arterial Streets with Reduced Speed Limits

Some arterial and collector streets (such as portions of Hastings Street, Victoria Drive, E 29th Avenue, Champlain Crescent, Prior Street and Beach Avenue) have had their speed limits reduced to 30 km/hr by City Council in response to local safety concerns. Typical speed management measures (e.g. speed humps, raised crosswalks) cannot be implemented on arterial and collector streets without significant impacts on emergency vehicles, goods movement and transit. Tools typically used for speed management on arterial and collector roads consist of design (street cross section) and operational (signal) changes to encourage compliance, in addition to enforcement. Examples include reducing the number of motor vehicle lanes, narrowing lanes, adding street trees, re-purposing under-utilized lanes for other modes, reducing the length of green signal time, and reprogramming the coordination of signals for a lower progression speed.

To test the effectiveness of these approaches, in Winter 2022, staff collected speed and traffic volume data on arterial and collector streets where speed limits have been reduced to 30 km/hr. The key findings are as follows:

- Average speeds ranged from 35 km/hr to 40 km/hr
- 85th percentile speeds ranged from 42 km/hr to 49 km/hr
- The majority of vehicles (74% to 89%) were observed travelling over 30km/hr
- A minority of vehicles (2% to 13%) were observed travelling over 50 km/hr

At the two most recent examples, speed data from both before and after the speed limit reductions was available (E/W Hastings, Prior St). The main findings are listed below:

- A reduction in average speeds (20% lower compared to before) and 85th percentile speeds (13% to 17% lower compared to before)
- While the majority of vehicles still travelled over 30 km/hr after the changes (75% to 80%), a significant reduction in the percentage of vehicles travelling over 50 km/hr was observed (47% to 70% lower compared to before)
- A reduction in collisions leading to injuries

In summary, modest speed and collision reductions could be expected when reducing speed limits on arterials and collectors. For a more detailed analysis of the collector and arterial speed reductions results see Appendix B.

Section 2: Arterial and Collector Streets Adjacent to Schools

There are 78 schools within Vancouver that are adjacent to collector or arterial streets, 76 with a speed limit of 50 km/hr and 2 with a speed limit of 30 km/hr. Multiple school communities have requested speed reductions in school zones adjacent to arterials or collectors to address safety concerns and to improve the comfort of students using active modes of travel. In several cases the request was triggered by a collision happening in the school zone.

In the fall of 2021, vehicle speed and volume data was collected at 20 locations to gain a better understanding of current conditions (see Appendix C). The selected locations represent a wide variety of schools, road uses, and street configurations. The main findings from the data are as follows:

- Average speeds were lower than 50 km/hr at all locations
- The 85th percentile speeds ranged from 43 km/hr to 58 km/hr
- The percentage of vehicles travelling over 50 km/hr ranged from 1% to 42%
- A very low percentage of vehicles 0% to 2% travelled above 70 km/hr
- Speeds generally increased as the number of lanes increased
- Major Road Network (MRN) speeds were higher compared to collectors and arterials
- Speeds in school zones on a collector with an existing 30 km/hr speed limit had on average lower speeds (32 km/hr to 39 km/hr), compared to school zones on a collector with a 50 km/hr speed limit (38 km/hr to 46 km/hr)

The data shows that most vehicles travelled under 50 km/hr during peak periods, even when the speed limit was set at 50 km/hr. Formalizing a lower speed limit would not significantly impact vehicle travel times and congestion during peak periods, but could lower vehicle speeds outside of peak periods and incentivize vehicles travelling above 50 km/hr to lower their speeds.

Section 3: Speed Limit Policies from Peer Cities and Industry Guidelines

The majority of municipalities within North America follow similar school zone standards as the City of Vancouver. However, in recent years several municipalities have changed their policies to allow for reduced speeds on arterial and collector streets adjacent to schools. A number of studies have been completed to evaluate the effectiveness of school zone speed changes. A summary of the policies and key study findings is presented in Appendix D.

The “City Limits Setting Speed Limits on Urban Streets” guideline published in 2020 by NACTO (National Association of City Transportation Officials) provides guidance on how to set speed limits in urban environments, with the goal of reducing fatalities and serious injuries. The guideline recommends speed limits based on speeds that reduce the risk to vulnerable road users, such as pedestrians and cyclists.

The recommended speed limit for lanes is 20 km/hr, for minor streets is 30 km/hr and for major streets is 40 km/hr. When it comes to major streets, municipalities can conduct a safe speed study to determine the safest maximum speed limit. Appendix E presents detailed steps and tools to assess safe speed limits.

For the case of school zones, the guideline recommends implementing slow zones near schools on minor streets or reduced speed limits for schools on major streets. If maintaining traffic flow on major streets is a concern, using time-of-day speed limits is recommended. Speed limits can be as low as 20 km/hr on major streets near schools to provide additional protection for children.

Section 4: Implications of Amending Posted Speed Limits and Consultation

City staff are currently consulting with TransLink, Coast Mountain Bus Company, Emergency Services and the BC Trucking Association to determine potential travel time impacts on transit, goods movements and emergency services. Of the 76 schools within Vancouver adjacent to collector or arterial streets with a speed limit of 50 km/hr, 55 are on bus routes and 43 are on truck routes.

TransLink staff for example suggested several methods to mitigate impacts on bus speed and reliability on affected streets, including the addition of bus bulbs, queue jump lanes, turn pockets or passive bus signal priority. Staff will look at these options over time if there are impacts to transit from reducing speed limits

Changes to transit, truck and emergency routes should also be carefully considered. To reduce impacts the City could implement school zone speed reductions with time and day limitations. Additionally, the City could consider not including streets on the Major Road Network (MRN). MRN streets are less appropriate candidate streets for a speed reduction due to their role in supporting people and goods movement across the region and, as they are co-managed by TransLink, would need their support for a speed reduction. Of the 76 schools within Vancouver adjacent to collector or arterial streets with a speed limit of 50 km/hr, 25 are on the MRN.

City staff are currently engaging with the Vancouver Police Department (VPD) to determine potential impacts when it comes to enforcement requests related to a speed reduction in school zones on arterials and collectors. The VPD is supportive of the initiative and could provide special attention during the initial launch of the speed limit reduction. However, given limited resources and their duty to police all areas of the City, ongoing enforcement presence will represent a challenge.

Section 5: Next Steps & Conclusion

The next step is to undertake a pilot to reduce speed limits in school zones on arterials and collectors, under the following conditions:

- 30 km/hr speed limit for school zones adjacent to collectors
- 40 km/hr speed limit for school zones adjacent to secondary arterials and arterials
- No change to speed limits for schools zones on the MRN
- The proposed reduced speed limits would be in effect during school hours only (8am-5pm school days)

Restricting the reduced speed limits to school hours and not including MRN streets will mitigate stakeholder concerns related to truck travel times, emergency services vehicles, and bus speed and reliability.

Staff plan to implement the pilot at nine schools as listed in Table 1. The selected locations met at least one of the following criteria:

- At least 20% of vehicles were travelling over 50 km/hr
- The 85th percentile speed was over 50 km/hr
- There was past community feedback that vehicles are consistently speeding

The pilot will focus on elementary schools, as elementary school-aged students are more vulnerable than high school-aged students are.

Staff will install speed limit signage to accompany the current school zone signage at the schools selected for the pilot. School zone and speed limit pavement markings could also be installed to draw additional attention to the school zone.

Communicating speed limit changes to the public is key to a successful speed reduction program. The implementation of the speed changes in school zones will be paired with a public education campaign to inform road users of the change before speed limit signs are installed and to continue reinforcing the messaging afterwards. The Community Policing Centres (CPCs) have agreed to provide further educational support through the Speed Watch program. This program is a volunteer-led initiative, so the extent of the support will depend on volunteer availability at each local CPC. Engagement with the schools will be undertaken in late 2022, prior to the speed reduction which will launch in early 2023.

Table 1. Recommended pilot schools (see Appendix F)

School	Location ¹	Lanes per Direction	Street Classification	Bus or Truck Route
Sir Wilfred Laurier Elementary	800 W 57 th Ave	1	Collector	No
Waverley Elementary	6100 Elliot St	1	Collector	Bus Route
Dr. Annie B Jamieson Elementary	600 W 49 th Ave	1	Secondary Arterial	Bus Route
John Norquay Elementary	4600 Slocan St	1	Secondary Arterial	Bus Route
Florence Nightingale Elementary	400 E 12 th Ave	2	Secondary Arterial	No
Dr. George M Weir Elementary	5900 Rupert St	2	Secondary Arterial	Bus Route
Stratford Hall	3000 Commercial St	2	Arterial	Bus Route
Henry Hudson Elementary	1900 Cornwall St	2	Arterial	Bus Route
Crosstown Elementary	100 Expo Blvd	3 (one-way)	Arterial	Bus and Truck Route

¹These locations represent the 100 block that will receive a speed reduction adjacent to the school.

Vehicle speed and traffic volume data will be collected 6 months and 1 year after the speed limit reduction is in place to determine the impacts of the pilot. In addition, feedback will be collected from partner organizations such as the Vancouver School Board, the Vancouver Police Department, TransLink, Coast Mountain Bus Company, BC Trucking Association and Emergency Services.

The pilot will cost approximately \$100,000. This includes \$50,000 for signage and paint changes, \$30,000 for education and \$20,000 for data monitoring. The funding will come from re-allocation of resources from existing programs.

Staff will report back to Council with the results from the pilot in Spring 2024. Based on the results, next steps could include an expansion of speed limit reductions to all remaining schools adjacent to arterial and collectors outside of the MRN. Complementary speed management measures could be implemented at challenging locations where signage alone is not effective to self-enforce the reduced speed limit.

I trust this memo responds to Council's motion around speed limits on school zones adjacent to collector and arterial streets. Please contact me directly if you have any questions.

A handwritten signature in blue ink, appearing to read 'Lon LaClaire', with a stylized, cursive script.

Lon LaClaire, M.Eng., P.Eng.
General Manager, Engineering Services

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Appendix A. Impact of Lowering Vehicle Speeds

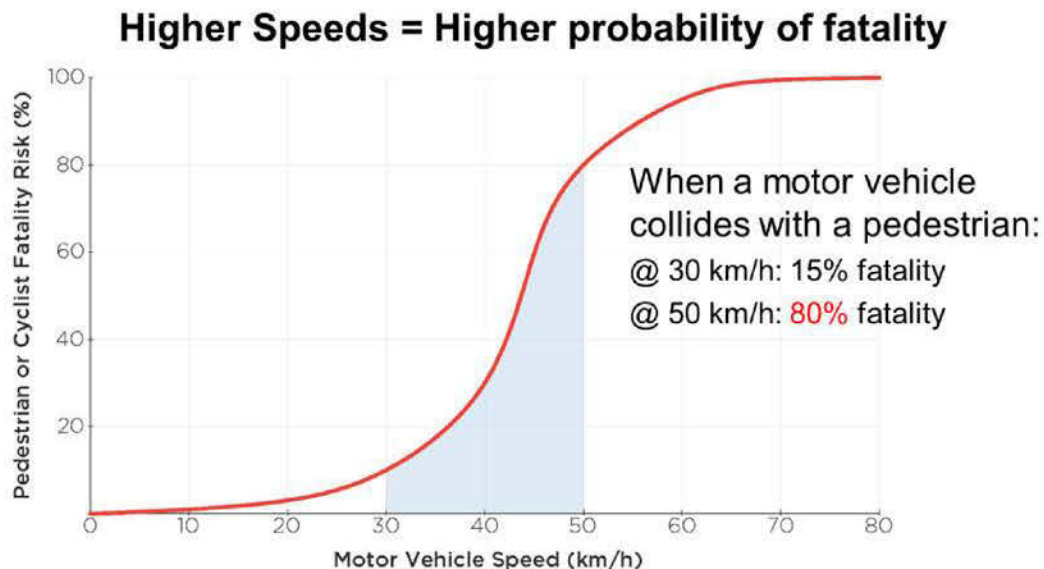


Figure 1. Probability of a pedestrian fatality in the event of a collision compared with vehicle speed (Source: Speed Management Manual, World Health Organization)

Appendix B. Current Speeds on Arterials and Collectors with a 30 km/hr Speed Limit

Table 2 lists several arterial and collector streets within Vancouver which underwent speed limit reductions to 30 km/hr.

Data from before and after the speed limit reductions is available at the two locations most recently implemented, Prior St and E/W Hastings St.

On January 27th, 2020, the posted speed on Prior St was reduced from 50 km/hr to 30 km/hr. The change was implemented by installing 30 km/hr signs between Hawks Ave and Raymur Ave. In addition, rush-regulated parking along Prior St between Gore Ave and Raymur Ave was converted to all-day parking. Signals along this corridor were retimed to allow for vehicles to travel most efficiently at 30 km/hr. Vehicle speed and volume data was collected before this transition in November 2019 and December 2019 at the 800 Block of Prior St. Vehicle speed and volume data was also collected at the same location after this transition in February 2020 and November 2021.

On July 13th, 2011, Vancouver City Council voted to establish a 30 km/hr pedestrian safety zone on Hastings St between Abbott St and Jackson St. Speed data was collected at several locations along Hastings St in 2011 before the implementation of the speed reduction. Speed data was also collected at the intersection of Gore Ave & Hastings St in 2013 after the implementation of the speed reduction. This data was provided by ICBC and was collected using speed reader boards.

Table 2. List of arterials and collectors with reduced speed limits

Corridor	Number of Lanes	Rationale	Speed Management Tools	Average Speed	85 th Percentile Speed	Percentage of Vehicles over 30 km/hr	Percentage of Vehicles over 50 km/hr ³
Collector Streets							
E 29th Avenue (Slocan St to Atlin St)	2	Playground	Signs	40 km/hr	48 km/hr	88.6 %	9.6%
Arbutus Street (W 7 th Ave to W 8 th Ave) ¹	2	School	Signs	35 km/hr	42 km/hr	79.9%	1.5%
Champlain Crescent (Three Cedars Dr to Langford Ave)	2	School	Signs	39 km/hr	48 km/hr	86.1%	8.8%
Victoria Drive (Grant St to E 19 th Ave) ²	2	School and playgrounds	Signs Speed reader boards	36 km/hr	44 km/hr	76.4%	4.5%
Secondary Arterial Streets							
Prior Street (Hawks Ave to Raymur Ave)	4 (before) 2 (after)	Playground	Signs Paint Speed reader boards Temporary bulges Re-timing of signals Re-allocation of road space (2 lanes of traffic converted to all day parking)	38 km/hr	49 km/hr	80.5 %	13.1%
Arterial Streets							
E/W Hastings Street (Abbott St to Jackson St)	6	General Safety	Signs Paint Speed reader boards	37 km/hr	48 km/hr	74.6%	9.8%
Beach Avenue (Park Ln to Burrard St)	3 (before) 2 (after)	Playground	Signs Re-allocation of road space (1 lane of traffic converted to bi-directional bike lanes)	36 km/hr	44 km/hr	80.5 %	2.8%

¹Arbutus St is classified as a local street at this location, but has the volumes of a collector street.

²Select sections adjacent to playgrounds and school

³Data on top end speeders (vehicles travelling over 70 km/h) not included, as only 0% to 1% of vehicles fall within this category.

Table 3 summarizes the speed changes at Prior St and Hastings St before and after the speed reductions. Please note that the 2013 Hastings St data did not include the percentage of vehicles over 30 km/hr, 50 km/hr or 70 km/hr.

Table 3. Results of speed limit reductions at Prior Street and Hastings Street

Prior Street			
	2019	2020	2021
Average Speed:	48	42	38
Median Speed	48	41	38
85th Percentile Speed:	59	53	49
Percentage over 30 km/hr:	94%	95%	80%
Percentage over 50 km/hr:	43%	20%	13%
Percentage over 70 km/hr:	2%	1%	0%
Hastings Street			
	2011	2013	2022
Median Speed:	44	36	35
85th Percentile Speed:	52	47	45
Percentage over 30 km/hr:	98%	n/a	75%
Percentage over 50 km/hr:	19%	n/a	10%
Percentage over 70 km/hr:	0%	n/a	0%

Furthermore, it should be noted that number of lanes on Prior St was reduced from four to two. It is possible that some of the speed reduction on Prior St was due to increased congestion during peak hours. Figure 2 and figure 3 show vehicles speeds and volumes over the course of a 24 hour period at Prior St and Hastings St during Winter 2022. The figures show that vehicle speeds and volumes are inversely correlated.

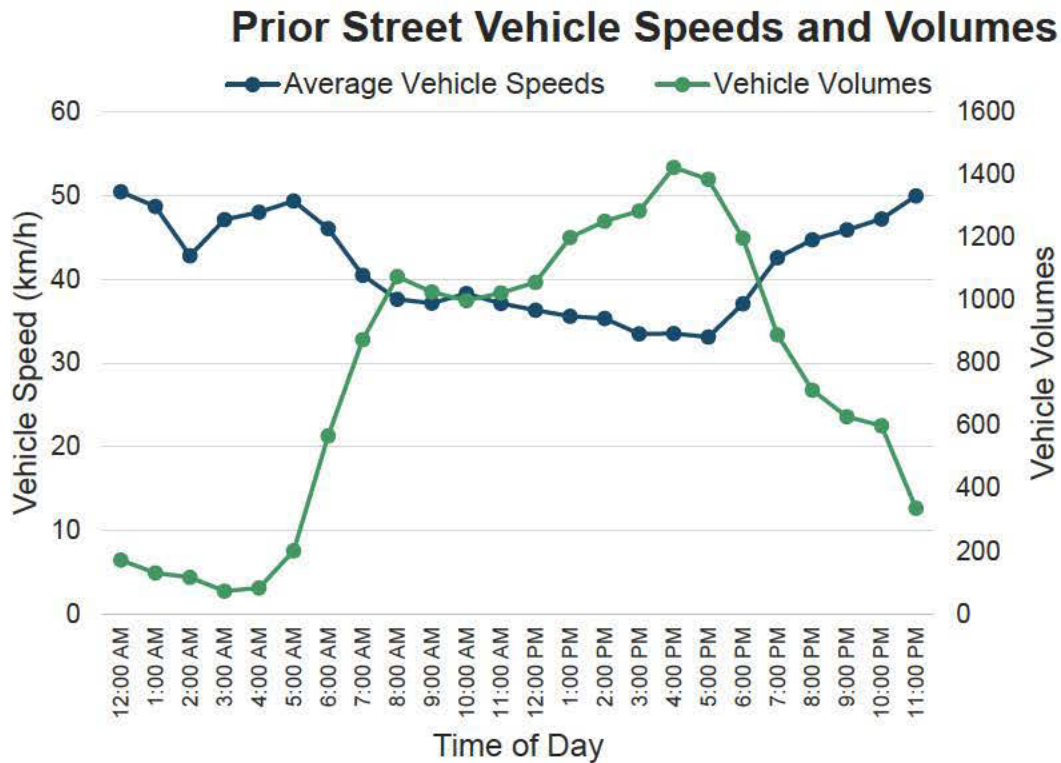


Figure 2. Prior Street vehicle speeds and volumes over a 24 hour period (Winter 2021)

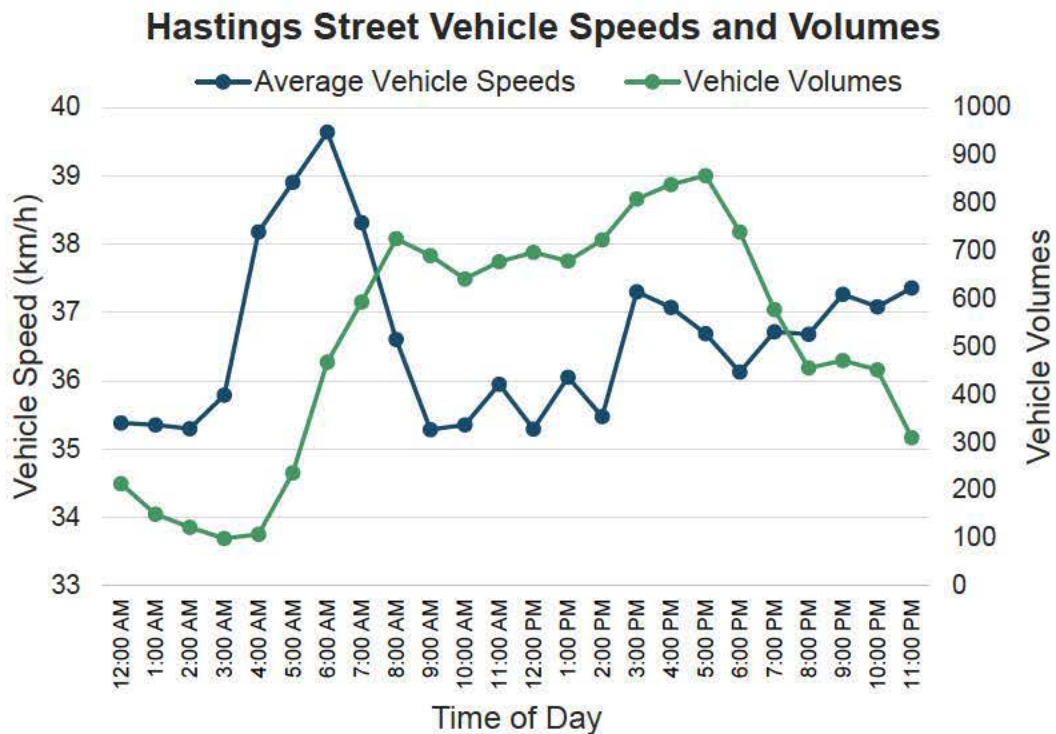


Figure 3. Hastings Street vehicle speeds and volumes over a 24 hour period (Winter 2022)

The 5-year average number of total collisions, collisions resulting in injuries, and collisions resulting in fatalities was also analyzed using ICBC data at E/W Hastings St and Prior St. The total number of collisions and the severity of the collisions significantly decreased at Prior St. At Hastings St, the total number of collisions did not decrease, but the severity of the collisions significantly decreased. A summary of the data is shown in Table 4.

Table 4. Collisions on Prior Street and Hastings Street before and after the speed limit reduction

Prior Street			
	Total Collisions	Injury Collisions	Fatal Collisions
5 Year Average Before:	26	10	0
2 Year Average After:	15	5	0
Percent Change:	-43%	-51%	0%
Hastings Street			
	Total Collisions	Injury Collisions	Fatal Collisions
5 Year Average Before:	155	65	0.8
5 Year Average After:	158	59	0.6
Percent Change:	2%	-10%	-25%

It should be noted that the first year of the Prior St speed reduction was 2020, and there was an overall decrease in traffic within Vancouver in 2020 due the COVID-19 pandemic. Citywide this resulted in a 44% reduction in total collisions, a 41% reduction in traffic-related injuries and a 46% reduction in traffic-related fatalities compared to the previous 5-year average.

Appendix C. School Data

Expected Speed Reduction in School Zones on Arterials and Collections

There are three locations within the City of Vancouver where the speed limit is set at 30 km/hr on collector streets adjacent to schools. They are the 7800 block of Champlain Crescent, the 2300 block of Arbutus Street, and the 1900 block of Victoria Drive. Although Arbutus Street is technically a local street on this block, it functions as a collector street. It has similar traffic volumes, signage, and paint markings as other collector streets within Vancouver, so for the purposes of this analysis it is considered as a collector street.

Table 5 compares vehicle speeds at these three 30 km/hr school zones on collector streets against vehicle speeds at 50 km/hr school zones on collector streets.

Table 5. *Speeds on collector streets adjacent to schools with 30 km/hr versus 50 km/hr speed limits*

Location	Speed Limit (km/hr)	Average Speed (km/hr)	85th Percentile Speed (km/hr)	Percentage of Vehicles Over 50 km/hr ¹
7800 Champlain Cres	30	39	48	8.8%
2300 Arbutus St	30	35	42	1.5%
1900 Victoria Drive	30	32	38	0.6%
Average Collector Street Adjacent to Schools	50	44	55	27.6%

¹There is some discrepancy between the percentage of vehicles over 50 km/hr in table 2 and table 5. This is because table 2 presents vehicle speeds over the whole speed reduction corridor, while table 5 presents vehicle speeds only on the block adjacent to schools.

Table 6 compares vehicle speeds on the average arterial street with a speed limit of 50 km/hr adjacent to a school with vehicle speeds on Hastings Street, which is an arterial street with three lanes per direction and a speed limit of 30 km/hr.

Table 6. *Speeds on arterial streets adjacent to schools compared with speeds on 30 km/hr arterials*

Location	Speed Limit (km/hr)	Average Speed (km/hr)	85th Percentile Speed (km/hr)	Percentage of Vehicles over 50 km/hr
Hastings Street	30	37	48	74.6%
Average Arterial Street Adjacent to School	50	41	52	21.1%

School Zones Speed Data

The speed data in figure 4 and figure 5 is broken down by street widths. As seen in figure 4 and figure 5, there was not a significant difference in median vehicle speeds on two lane streets compared with four lane streets. However, as the number of lanes increased the percentage of vehicles travelling above 50 km/hr also increased.

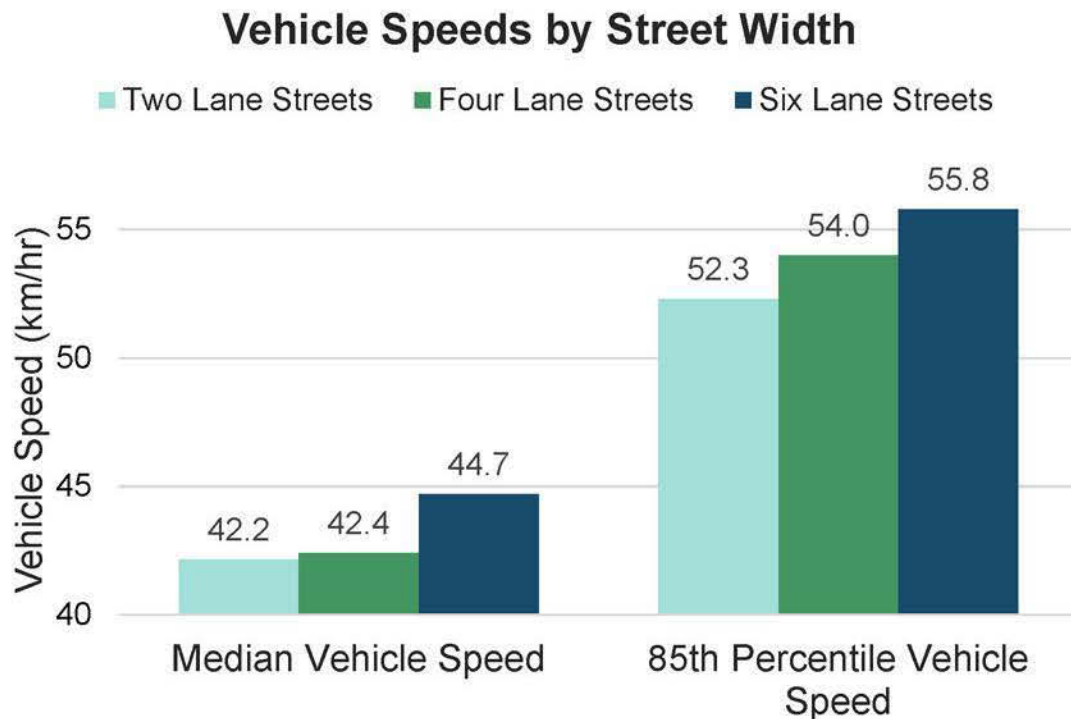


Figure 4. Vehicle speeds by street width

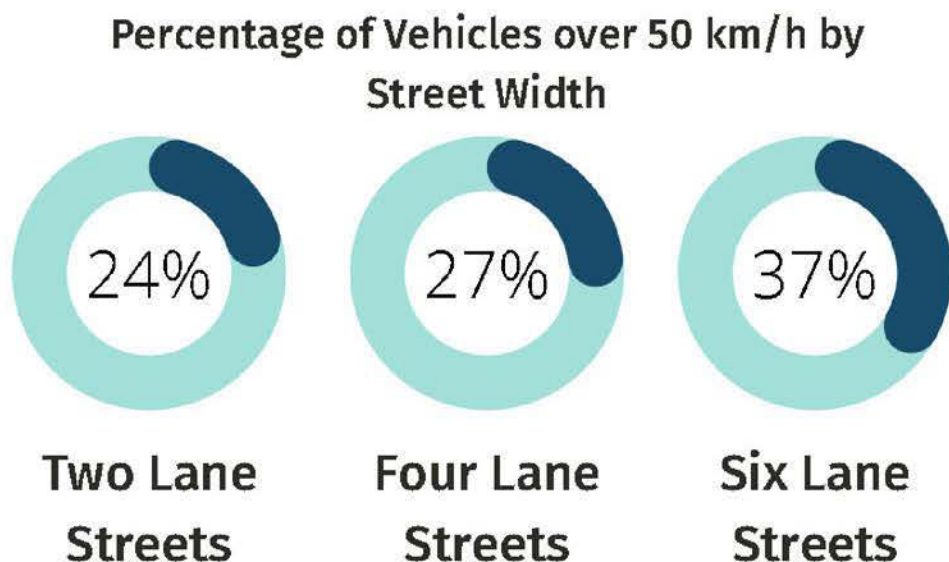


Figure 5. Percentage of vehicles over 50 km/hr by street width

The data in figure 6 and figure 7 is broken down by street classification. As seen in figure 6 and figure 7, vehicles travelled at similar speeds on collector, secondary arterial, and arterial streets. The major road network (MRN) is a road classification for streets owned by TransLink. MRN roads are critical for connecting commuter, transit and truck traffic across the Lower Mainland. Traffic speeds on these streets are slightly higher than on other street types.

Vehicle Speeds by Street Classification

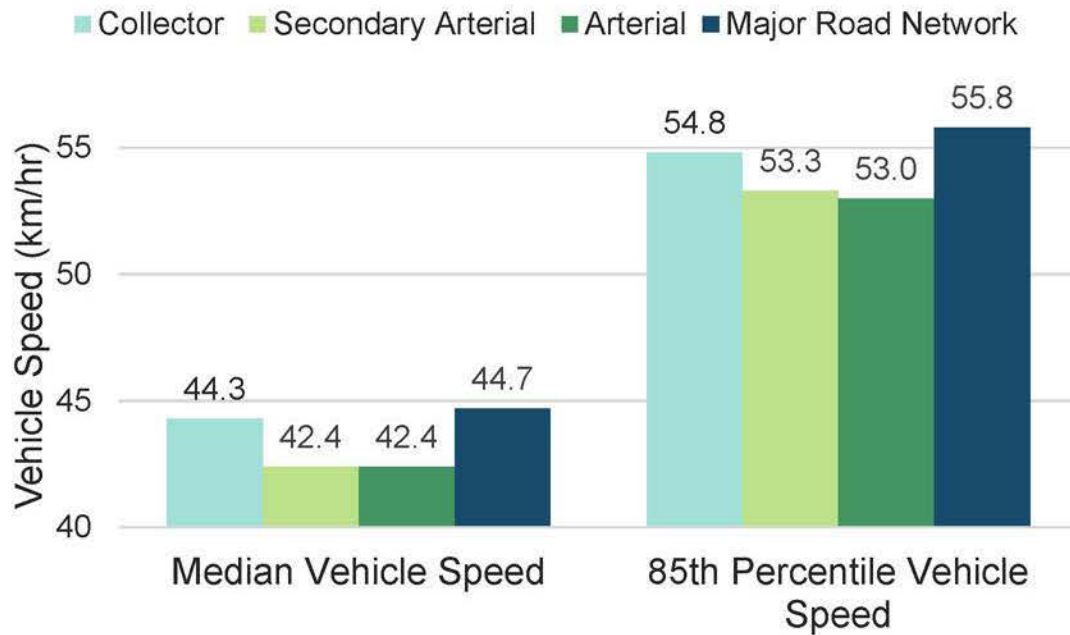


Figure 6. Vehicle speeds by street classification

Percentage of Vehicles over 50 km/h by Street Classification

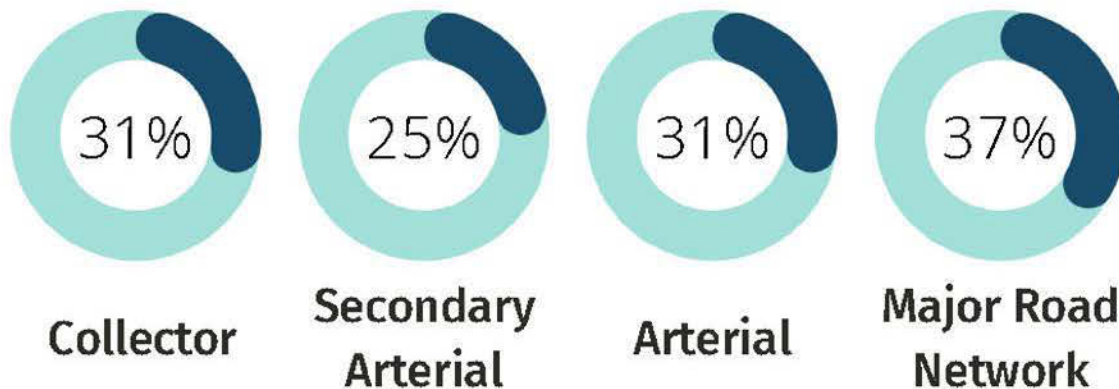


Figure 7. Percentage of vehicles over 50 km/hr by street classification

Table 7 shows a summary of the data taken at all schools over the Winter 2021/2022 study period. The boxes marked in red represent locations where either the 85th percentile speed exceeded 50 km/hr, or more than 20% of vehicles were travelling over 50 km/hr.

Table 7. 2021/2022 school data summary

	School	Location	Street Classification	Average Speed (km/hr)			85th Percentile Speed (km/hr)			Percentage of Vehicles Over 50 km/hr		
				8am - 9am	3pm - 4pm	Overall	8am - 9am	3pm - 4pm	Overall	8am - 9am	3pm - 4pm	Overall
Two-Lane	Simon Fraser Elementary	100 Blk W 16th Av	Secondary Arterial	37.01	39.07	41.89	47.02	47.12	48.96	5%	4%	10%
	Eric Hamber Secondary	800 Blk W 33rd Av	Collector	41.32	45.39	46.09	55.44	56.85	58.09	27%	34%	41%
	Sir Winston Churchill Secondary & Sir Wilfred Laurier Elementary	800 Blk W 57th Av	Collector	38.37	36.16	45.81	48.45	47.95	57.10	11%	10%	33%
	Killarney Secondary	2900 Blk E 49th Av	Secondary Arterial	36.15	34.27	42.27	46.97	45.72	51.58	6%	5%	17%
	Captain James Cook Elementary	3300 Blk E 54th Av	Secondary Arterial	36.14	32.34	39.20	46.29	40.10	48.24	4%	1%	9%
	Waverley Elementary	6100-6200 Blk Elliott St	Collector	41.04	41.82	46.35	49.61	50.43	56.16	13%	16%	32%
	Champlain Heights Annex	7800 Blk Champlain Cres	Collector	35.31	35.80	38.97	43.12	44.50	48.03	3%	4%	9%
	Sir Charles Kingsford-Smith Elementary	6800 Blk Elliott St	Collector	33.86	28.87	38.24	42.92	38.08	47.35	2%	2%	6%
	Dr. Annie B. Jamieson Elementary	600 Blk W 49th Av	Secondary Arterial	42.20	43.85	46.42	53.18	55.74	57.41	21%	29%	36%
	Renfrew Community Elementary	3300 Blk E 22nd Av	Collector	39.97	39.93	45.31	49.07	48.89	54.63	11%	10%	26%
	Sir Wilfred Grenfell Community Elementary	4500 Blk Rupert St	Secondary Arterial	36.32	37.52	41.52	46.85	47.63	52.53	6%	7%	19%
	Queen Victoria Annex	1900 Victoria	Secondary Arterial	31.66	29.71	32.29	38.42	37.25	38.77	0%	0%	1%
	St. Augustine	2300 Arbutus	Local	30.46	34.30	35.17	38.98	39.76	42.25	1%	0%	2%
	John Norquay Elementary	4600-4700 Blk Slocan St	Secondary Arterial	34.69	37.42	37.04	45.37	47.79	48.22	4%	7%	9%
Four-Lane	Florence Nightingale Elementary	400 Blk E 12th Av	Secondary Arterial	43.01	42.98	44.47	55.57	54.17	56.27	27%	23%	30%
	Henry Hudson Elementary	1900 Blk Cornwall Av	Arterial	42.32	38.68	40.54	49.76	47.94	49.42	14%	8%	13%
	Stratford Hall	1800 Blk Victoria Diversion	Secondary Arterial	45.70	43.72	45.58	56.80	53.55	56.80	33%	21%	32%
	Stratford Hall	1900 Blk Victoria Diversion	Secondary Arterial	35.44	33.52	36.58	42.38	39.85	45.08	1%	1%	3%
	Stratford Hall	2800 Blk Commercial Dr	Arterial	29.65	33.10	32.34	39.32	44.43	43.38	2%	4%	4%
	Stratford Hall	3000 Blk Commercial Dr	Arterial	37.83	41.71	40.15	54.71	55.40	55.37	25%	27%	27%
	Stratford Hall	3200 Blk Commercial Dr	Arterial	47.24	44.36	48.45	57.51	55.33	58.03	37%	27%	42%
	Stratford Hall	3800 Blk Victoria Diversion	Secondary Arterial	39.58	40.62	42.49	48.60	51.54	53.64	10%	17%	22%
	Dr. George M. Weir Elementary	5900 Blk Rupert St	Secondary Arterial	42.78	42.00	46.00	54.46	54.00	58.25	22%	21%	35%
Six-Lane	Crosstown Elementary	100 Blk Expo Blvd	Arterial	33.32	33.61	35.69	41.13	39.92	43.78	2%	1%	3%
	Tecumseh Elementary	1800 Blk E 41st Av	Arterial, MRN	37.53	36.89	41.36	47.78	45.97	52.96	9%	5%	20%
	Laura Secord Elementary	2100 Blk E Broadway	Arterial, MRN	42.62	44.87	46.54	53.04	55.38	57.15	20%	28%	36%
	Vancouver Technical Secondary	2500-2600 Blk E Broadway	Arterial, MRN	41.75	41.69	44.53	49.18	49.80	54.81	11%	14%	25%

Appendix D. Peer City Review of Speed Limits in School Zones

A summary of several different municipal policies is presented in Table 8.

Table 8. Speed limit policies on streets adjacent to schools in peer cities

Municipality	Speed Limit at Schools	Times in Effect	Locations	Methodology
City of Saskatoon	30 km/hr	8:00 am – 5:00 pm, Monday to Friday, September 1 st to June 30 th	All streets adjacent to public or private schools	<ul style="list-style-type: none"> School zone signage Public information campaign
City of Toronto	40 km/hr	No time limits on collector and secondary arterial streets, during school hours on arterial streets	Collector and secondary arterial streets adjacent to elementary or junior high schools which meet the following criteria: <ul style="list-style-type: none"> Street width is less than 10.5 m OR 85th percentile speed is less than or equal to 50 km/hr 	<ul style="list-style-type: none"> School zone signage Flashing beacons School zone pavement markings “Watch your speed” signs
City of Seattle	30 km/hr	During school hours	All streets adjacent to schools	<ul style="list-style-type: none"> School zone signage Flashing beacons Playground zone signs if speed limit is 30 km/hr
City of Edmonton	30 km/hr	7:30 am – 9:00 pm, all days	All collector streets adjacent to elementary or junior high schools	<ul style="list-style-type: none"> School zone signs if there is no change in speed limit
City of Calgary	30 km/hr	7:30 am – 9:00 pm, all days	Most streets adjacent to schools (excluding a small number of high traffic volume streets)	<ul style="list-style-type: none"> Playground zone signs

City of Saskatoon

In 2002 the City of Saskatoon reduced the speed limit from 50 km/hr to 30 km/hr in all school zones. The school zones are in effect 8:00 am to 5:00 pm, Monday to Friday from September 1st to June 30th, and include all streets adjacent to public or private schools. The school zone signage was installed in the summer months, and a public information campaign was held before the start of the new school year to inform drivers of the changes.

In 2003 the City commissioned a study to evaluate the speed limit change’s effectiveness. The study found the following results:

- 85th percentile speeds within school zones on local, collector, and arterial streets dropped by 10 km/hr, from 54.5 km/hr to 44.5 km/hr
- Arterial streets experienced the greatest drop in speed

- There was low compliance with the 30 km/hr speed limit, with only 23% of vehicles travelling at or below the speed limit
- School zone streets experienced a 13% drop in weekday traffic volumes, which could be problematic if traffic shifted off of arterial streets onto neighboring local streets to avoid the school zone

City of Toronto

In the City of Toronto, the speed limit is set at 40 km/hr on collector and secondary arterial streets which are narrower than 10.5 metres or where the 85th percentile speed is less than 50 km/hr, and where one of the following warrants is met:

- Street is adjacent to an elementary or junior high school
- Street is adjacent to a park used to access elementary or junior high school
- There is no sidewalk on both sides of the street
- The travelled portion of the street is less than 5.7 metres (two-way) or 4.0 metres (one-way)
- There are two or more locations where the street grade is greater than 5% and/or the safe speed at curves is under 50 km/hr
- There are two or more locations with insufficient stopping distance at 50 km/hr
- There have been five or more collisions over three years where vehicle speed was identified as a factor

The speed limit can be set at 30 km/hr on local and collector roads if a resident petition is completed and certain criteria are met.

On major arterial streets the speed limit may drop to 40 km/hr during school hours. School zones are demarcated with school zone safety signs, flashing beacons, school zone pavement stencils, and “watch your speed” signs and zebra crosswalk markings. The City of Toronto is planning to extend school zone pavement markings up to 150 metres from schools.

City of Seattle

In 2020 the City of Seattle changed the posted speed limit on most arterial streets to 25 mph (40 km/hr) as a component of their Vision Zero strategy. The City is currently working with the Washington State Department of Transportation (WSDOT) to reduce the speed limit on WSDOT arterial streets to 25 mph.

Prior to adjusting speed limits on all of their arterial streets, the City of Seattle completed a pilot study to evaluate the effectiveness of lowering speed limits. The streets chosen for the pilot project had 25 mph (40 km/hr) signs installed at 0.25 mile (0.4 km) intervals. Before the project, these streets were either unsigned, with a default speed limit of 25 mph (40 km/hr), or signed at 30 mph (48 km/hr) at 1 to 1.5 mile (1.6 to 2.4 km) intervals.

The pilot project found that signing alone decreased median speeds by 9.9%, 85th percentile speeds by 7.1%, and vehicles travelling above 40 mph (64 km/hr) by 54.1%. In addition, collisions decreased by 22% and collisions resulting in injuries decreased 18%.

The speed limit within school zones is set at 20 mph (30 km/hr) on both local and arterial streets. In 2002 the City of Seattle began installing flashing beacons at the entrances to school

zones. The City prioritised collectors and secondary arterial streets with the highest average daily traffic (ADT). Flashing beacons were later installed in all school zones on non-arterial streets.

The City enforces the speed limit at 14 schools with speed cameras.

City of Edmonton

The City of Edmonton sets the speed limit at 30 km/hr at elementary and junior high schools on local and collector streets from 7:30 am to 9:00 pm using playground zone signs. At high schools and at elementary and junior high schools on arterial streets, yellow school zone signs are installed, but the speed limit is not changed.

In 2021 the City of Edmonton changed the default speed limit on local speeds to 40 km/hr. The speed limit on some arterial streets with high pedestrian volumes was also changed to 40 km/hr.

City of Calgary

In 2016 the City of Calgary consolidated school and playground zones to create one single zone type. The new zone type has a speed limit of 30 km/hr, from 7:30 am to 9:00 pm, every day of the week year-round. Calgary previously had playground zones and school zones which applied during different times of the day and during different days of the year. The City consolidated the playground and school zones to create a consistent standard that was easier for drivers to remember. A study was conducted in 2017 by the City of Calgary to evaluate the effects of the changes. The study produced the following results:

- Mean vehicle speed in playground zones was reduced from 36 km/hr to 30 km/hr. The effects on vehicle speed were especially pronounced during the hours of 6:00 pm to 9:00 pm
- 85th percentile vehicle speed in playground zones was reduced from 49.2 km/hr to 37.2 km/hr
- Pedestrian collisions in new playground zones decreased by 33%
- Pedestrian collisions in new playground zones between 5:30 pm and 9:00 pm decreased by 70%

Appendix E. NACTO City Limits Guideline

When it comes to major streets, municipalities can conduct a safe speed study to determine the safest maximum speed limit. A safe speed study will typically recommend speed limits of 30 km/hr or 40 km/hr for a major street (see Figure 8). Safe speed studies consist of the following steps:

- Collecting data on current corridor conditions such as speeds and collision history
- Assessing the appropriate safe speed based on the corridor's characteristics (Figure 9)
- Determining if a speed limit reduction is required and if further design/operational measures are appropriate to self-enforce the change (Figure 10)

Safe speed limits on major streets are determined based on two considerations (see Figure 11):

- Conflict density or how often conflicts occur on a street. Conflict density is a function of modal mixing (the level of physical separation of people walking, cycling and rolling) and crossing point density (how far apart are intersections or crossing points)
- Activity level or how busy a street is or is expected to be in the future



Figure 8. Recommended safe street speed limits by road classification (Source: City Limits Guideline, NACTO)

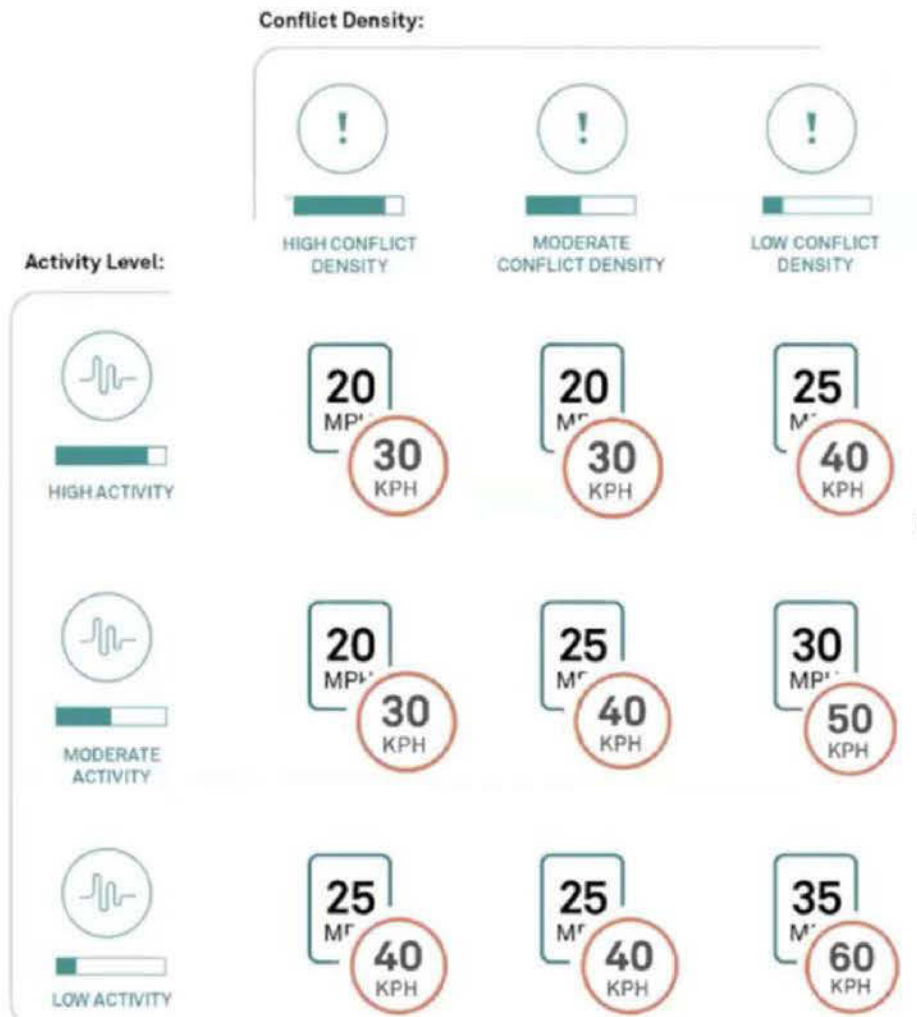


Figure 9. Safe speed decision tool (Source: City Limits Guideline, NACTO)

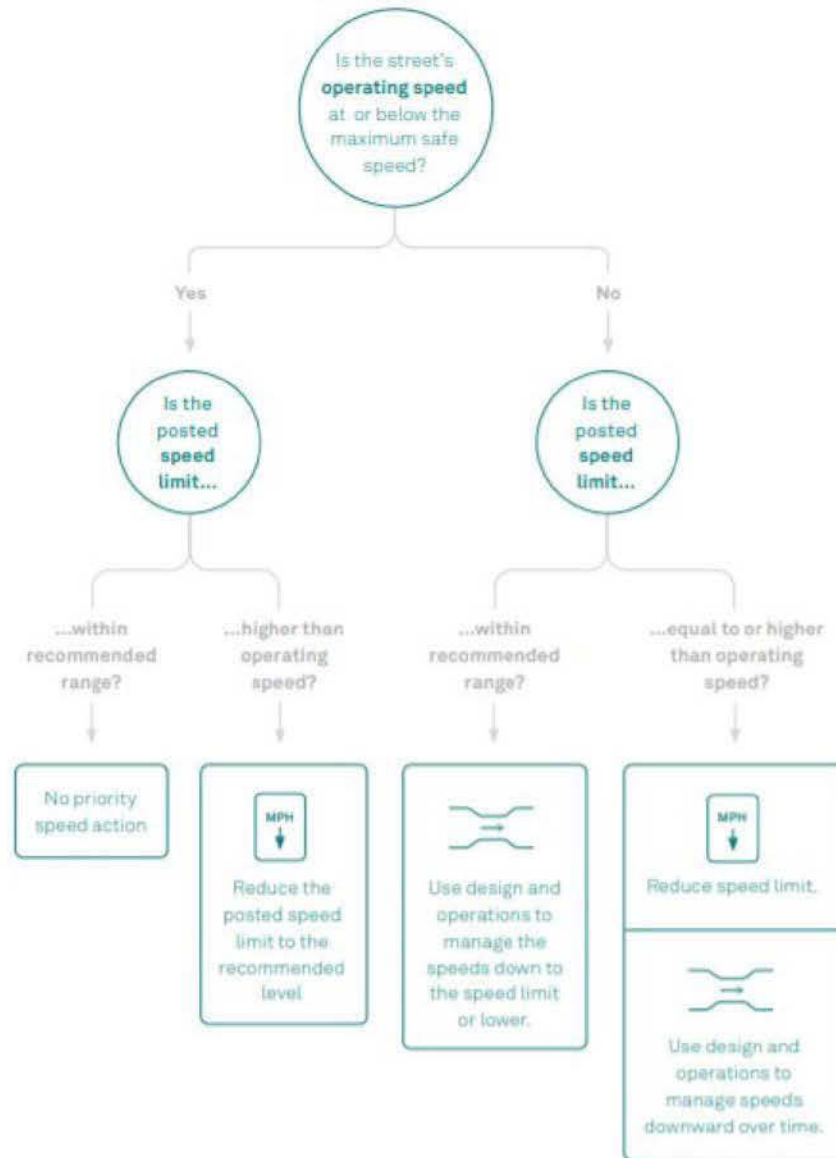


Figure 10. Speed management decision tool (Source: City Limits Guideline, NACTO)

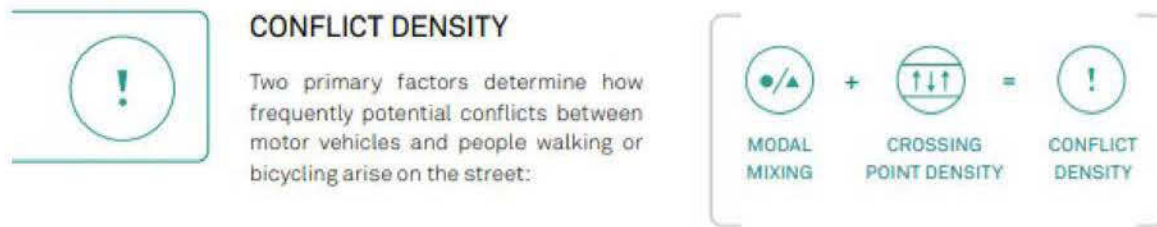


Figure 11a. Guidelines for assessing conflict density (Source: City Limits Guideline, NACTO)

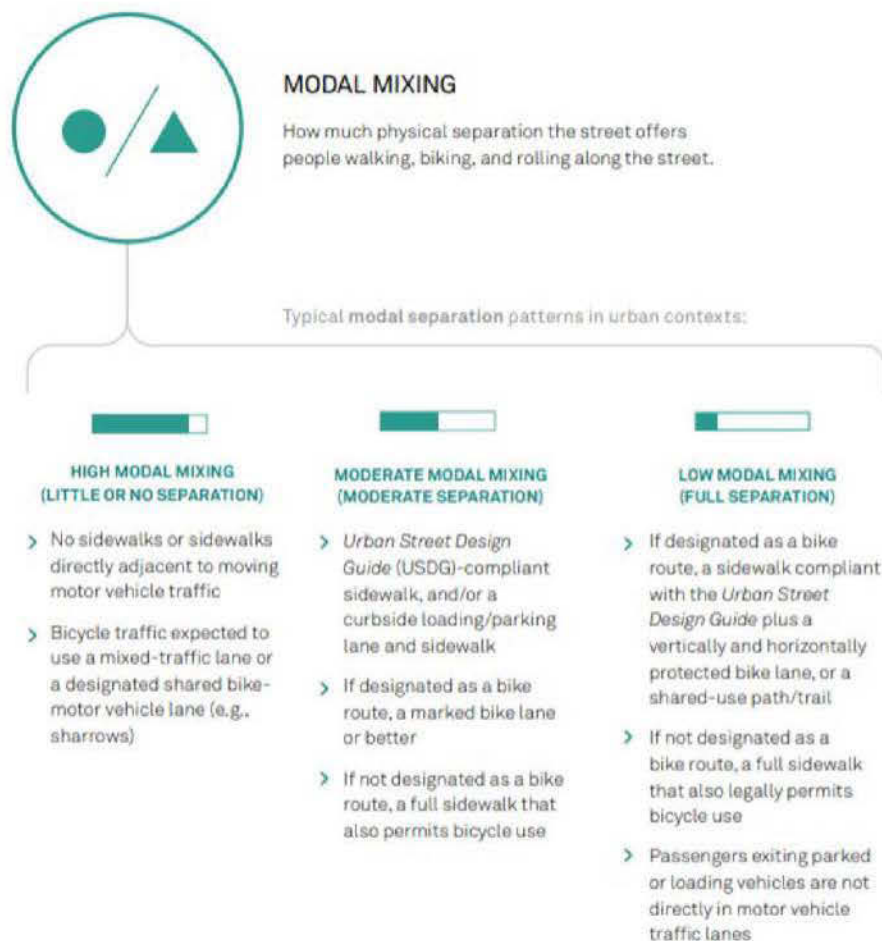


Figure 11b. Guidelines for determining level of modal mixing (Source: City Limits Guideline, NACTO)

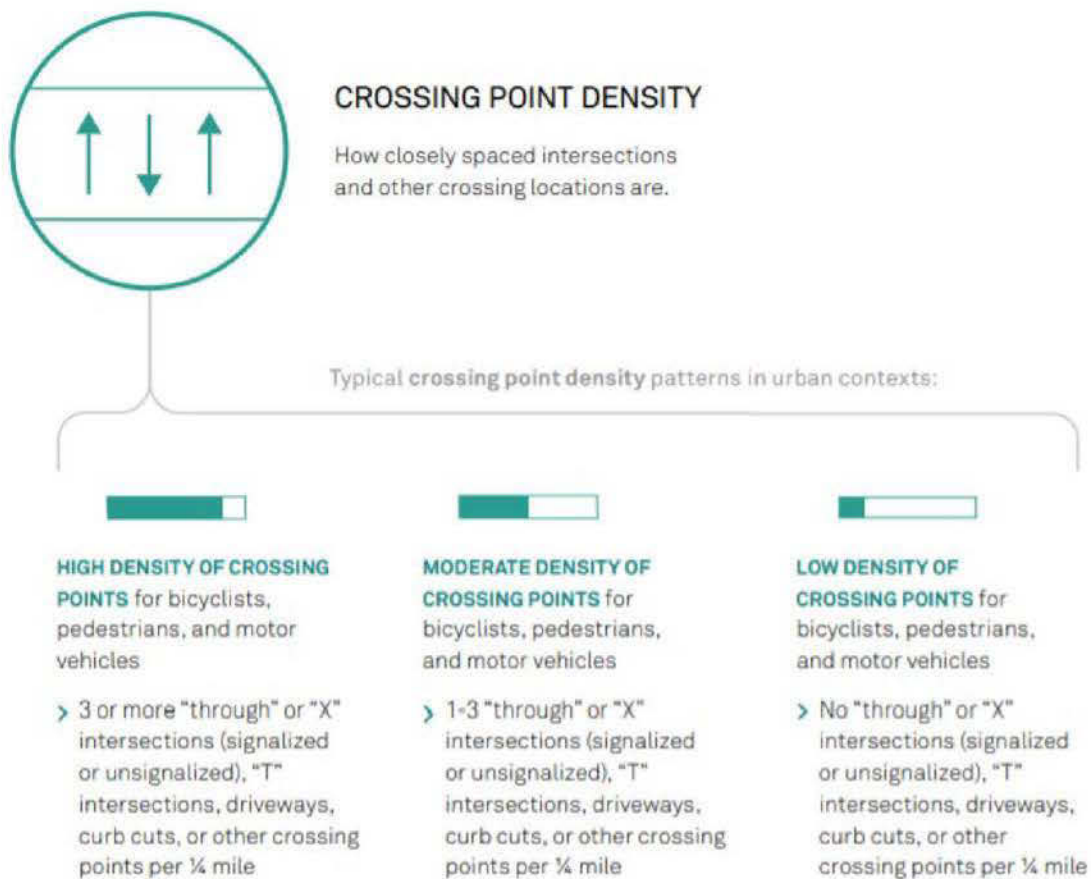
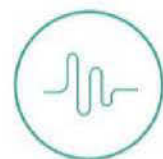


Figure 11c. Guidelines for determining level of crossing point density (Source: City Limits Guideline, NACTO)



ACTIVITY LEVEL & LAND USE

Activity levels influence the rate at which potential conflicts occur at any given site on the street. Activity can be measured directly where data is available, or through land use and transportation network proxies. Most urban streets are either high activity or moderate activity. This guidance intentionally does not set quantitative activity thresholds. Practitioners seeking to utilize quantitative thresholds should determine and set those based on what works well in their cities and what goals they are trying to meet.



Typical activity conditions and scenarios include:



HIGH ACTIVITY

Streets with lots of existing or expected pedestrian activity, active public spaces, important bike routes or planned bike routes, high curbside demand, and high density of transit stops

- Downtown / Central Business Districts
- Retail corridors
- High density residential and commercial streets



MODERATE ACTIVITY

Streets with moderate existing or expected pedestrian activity, moderately used public spaces, some existing or expected bike traffic, frequent driveways, curbside parking/loading, and moderate density of transit stops

- Moderate density residential and commercial streets
- Streets with light retail activity
- Mixed use corridors



LOW ACTIVITY

Streets with minimal expected pedestrian volumes, minimal expected or planned bike activity, low curbside demand, and few, if any, transit stops

- Low density industrial and residential streets

Figure 11d. Guidelines for determining activity level and land use (Source: City Limits Guideline, NACTO)

Appendix F. Recommended Pilot Schools

Table 9. Recommended pilot schools with speed data

School	Location	Number of Lanes per Direction	Street Classification	Bus or Truck Route	Percentage of Vehicles over 50 km/hr	85 th Percentile Vehicle Speeds (km/hr)
Sir Wilfred Laurier Elementary	800 W 57 th Ave	1	Collector	No	33%	57.1
Waverley Elementary	6100 Elliott St	1	Collector	Bus Route	32%	56.2
Dr. Annie B Jamieson Elementary	600 W 49 th Ave	1	Secondary Arterial	Bus Route	36%	57.4
John Norquay Elementary	4600 Slocan St	1	Secondary Arterial	Bus Route	9%	48.2
Florence Nightingale Elementary	400 E 12 th Ave	2	Secondary Arterial	No	30%	56.3
Dr. George M Weir Elementary	5900 Rupert St	2	Secondary Arterial	Bus Route	35%	58.3
Stratford Hall	3000 Commercial Dr	2	Arterial	Bus Route	27%	55.4
Henry Hudson Elementary	1900 Cornwall Ave	2	Arterial	Bus Route	13%	49.4
Crosstown Elementary	100 Expo Blvd	3 (one-way)	Arterial	Bus and Truck Route	3%	43.8