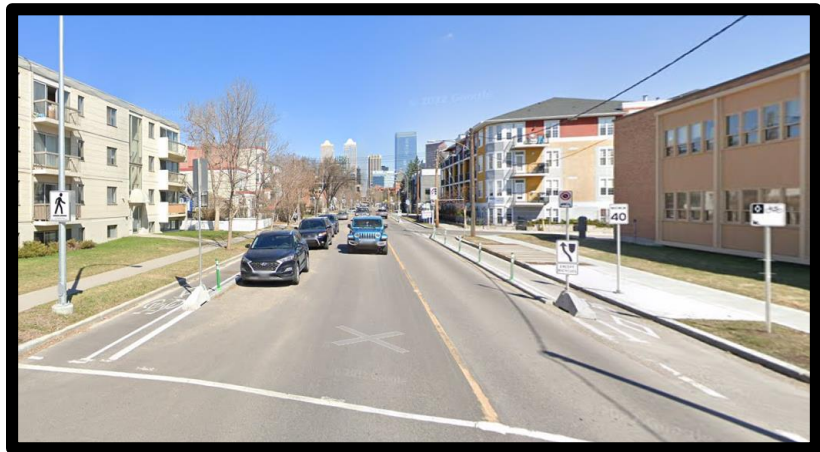


# Safer Collector Framework



**IP2022-0949**  
**September 9, 2022**  
**Mobility Operations, Mobility Safety**

## Safer Collector Framework Overview

Safety in Neighbourhoods continues to be a top concern for Calgarians. Improving safety outcomes in Neighbourhoods, through lower operating speeds, was the main goal of the Neighbourhood Speed Limit review; This goal remains the same for the Safer Collector Framework. Complimentary benefits of reduced vehicle speeds in Neighbourhoods include increased comfort and feelings of safety for people walking and cycling, lower noise levels, more confidence that walking or cycling to school is a viable option and making sidewalks or front yards more enjoyable places to visit with neighbours. This report builds on technical analysis completed for scenario development during the Neighbourhood Speed Limit Review in 2020. Previous analysis showed positive safety benefits associated with investing to reconstruct Collector Roadways but with a substantial initial capital cost. The full technical report for the Neighbourhood Speed Limit Review is available at [Calgary.ca/saferspeed](http://Calgary.ca/saferspeed), or by searching council records for report TT2020-1036.

Collector classification roadways in Calgary largely remained at 50 km/h following the reduction of default speed limit to 40 km/h starting May 31, 2021. There were, however, a select number of Collector roadways which already supported a lower speed that were reduced to 40 km/h. These were reviewed following citizen and Councillor requests for their alignment with publicly available criteria. Council also directed Administration to develop new design standards to re-build existing Collector roadways to support lower and safer speeds, and to develop a framework to reduce operating speeds on Collector classification roadways.

The Neighbourhood Speed Limit Review included a review of collisions by classification of road to describe the scope and scale of the issue. The key findings were that roughly one quarter of collisions in Calgary occur on roadways in neighbourhoods and one fifth of all casualties (injury and fatal collisions) occur on those roads. These are also the roadways for which Administration receives the most concerns through 311 because the operations impact citizens directly where they live.

Feedback from citizens who live along Collectors through 311 and Council following the speed limit change was overwhelmingly in support of reduced speed limits on Collector roadways. A citizen survey following the change also indicated that there is broad support for speed reductions in neighbourhoods, including on Collector roadways. One concern expressed by many citizens was equity given that those who live along Collector Roads continue to be exposed to higher operating speeds.

The Safer Collector Framework outlines an approach to continue reducing speeds on Collector roadways. Three approaches to encourage 40 km/h operations on Collector roadways are recommended and described in further detail in the report:

1. Continued review of Collectors for existing 40 km/h operations and reduce speed limit to match.
2. Permanent changes to Collector roads to encourage 40 km/h operations where collisions are highest, starting with temporary treatments to confirm functionality of new designs to achieve 40 km/h operating speeds.
3. Temporary and flexible changes to Collector roads to encourage 40 km/h where there is support from communities, policy or other programs.

Application of the Safer Collector Framework as presented above is intended to be flexible while advancing Collector roadway retrofits over time. An initial annual investment in 5 neighbourhoods using permanent measures and 5 communities using temporary measures would result in a 40-year horizon to bring all Collector roadways to the new standard. This gradual investment in collectors will also facilitate ongoing evaluation and adjustment to confirm best design strategies and value for investment. Criteria for reducing Collector roadways to 40 km/h may also evolve based on evaluations and changes in driver behaviour over time.

Evaluation, Education and Engagement principles of the Safer Mobility Plan will continue to be applied to support the Safer Collector Framework. Ongoing evaluation and refinement of our approach demonstrates value for citizens and can build support for further investments. The focus of this report is physical change of Collector roadways to make lower speeds more credible. However, our mobility system relies on

individual behaviour and choices which the City can support with better education and engagement about what the City is doing and why and how citizens can contribute to safer outcomes for all Calgarians.

## Citizen Survey of Initial Change and Support for Reduced Speed Limit

A survey of citizens was completed, following the change in default speed limit, to determine awareness of the speed limit change and perceptions of the impacts to citizens. The survey was conducted by Leger from July 28 – August 5th, 2021, with 503 Calgarians (aged 18 years or older) via phone using random digit dialing (RDD). The survey was conducted using numbers from both landlines (27% of completed surveys) and cell phones (73%) to obtain a random and statistically representative sample of Calgarians. The survey averaged 13.4 minutes in duration. The margin of error (MOE) for the total sample of n=503 is  $\pm 4.4$  percentage points, 19 times out of 20. To ensure the data were gathered from a representative group of Calgarians, sample quotas were set by age, gender, and city quadrant of the general population aged 18 and older. Data were then weighted to the 2016 Civic Census for age and gender.

### Key Findings:

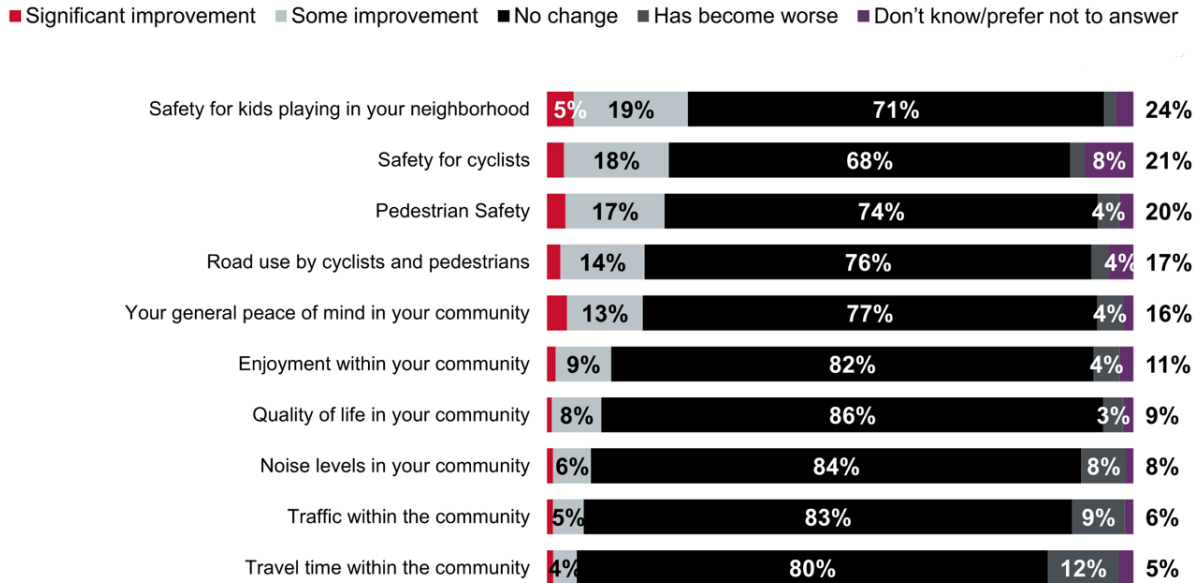
- Eight-in-ten survey respondents have recently read, seen, or heard anything about speed limits in Calgary.
- 81% of survey respondents say they have read, seen, or heard something about speed limits in Calgary, while only 19% indicated that they have not. This is up by 32 percentage points since the previous survey.
- Those aged 35+ are more likely than those aged 18-34 to have read, seen or heard anything about speed limits in Calgary (88% of those aged between 35-64 and 85% 65+ vs. 67% of those aged 18-34). However, for those aged 18-34, this is up from 49 percentage points in the first survey from 18%.
- Those who have lived in Calgary for 20 or more years are more likely than those who have lived in Calgary fewer than 10 years to have read, seen or heard anything

about speed limits in Calgary (86% of those who have lived in Calgary 20 or more years vs. 70% of those who have lived in Calgary Fewer than 10 years).

- Those who self-identify as a visible minority are less likely than other Calgarians to have read, seen or heard anything about speed limits in Calgary (74% of those who identify as a visible minority vs. 83% of those who do not).
- Of those survey respondents who have recently read, seen, or heard anything about speed limits in Calgary, just over seven-in-ten (71%) recall specific topics about “reducing the speed limit in residential zones to 40 km/hr. This had increased significantly by 44 percentage points since the previous survey where just under three-in-ten (27%) recalled this information.

In terms of changes that respondents have seen in their communities following the reduction of the unposted speed limit, almost a quarter say that they have seen improvement when it comes to safety for kids playing, followed by 21% who say that safety for cyclists has improved and 20% saying pedestrian safety has improved. A larger selection of factors and Calgarians responses are presented in Figure 1. Overall support for the speed limit change was found to be at least 60%, shown in Figure 2, with higher levels of support for those living on Collector roadways but requesting further changes.

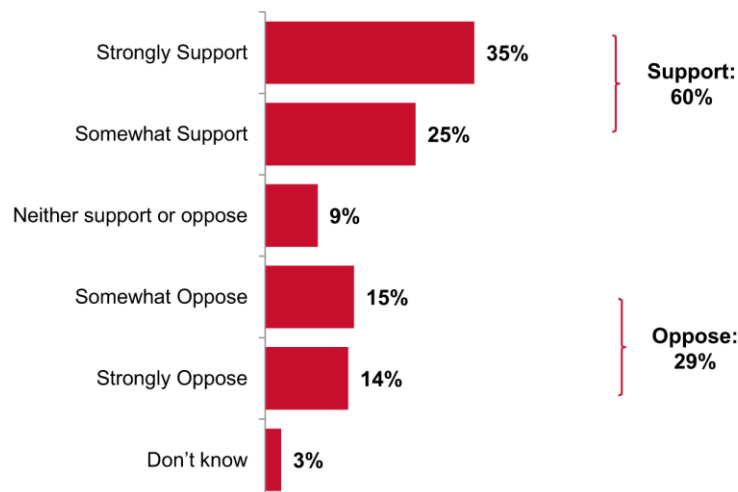
**Figure 1: Citizen perceptions of changes following unposted speed limit reduction**



Since the change to the unposted speed limit at the end of May, to what extent have you noticed a change in the following...  
Base: All respondents (n=503). Note. Data labels that are 3% or less are not shown.

**Figure 2: Citizen Support for Reduced Speed Limits in Neighbourhoods**

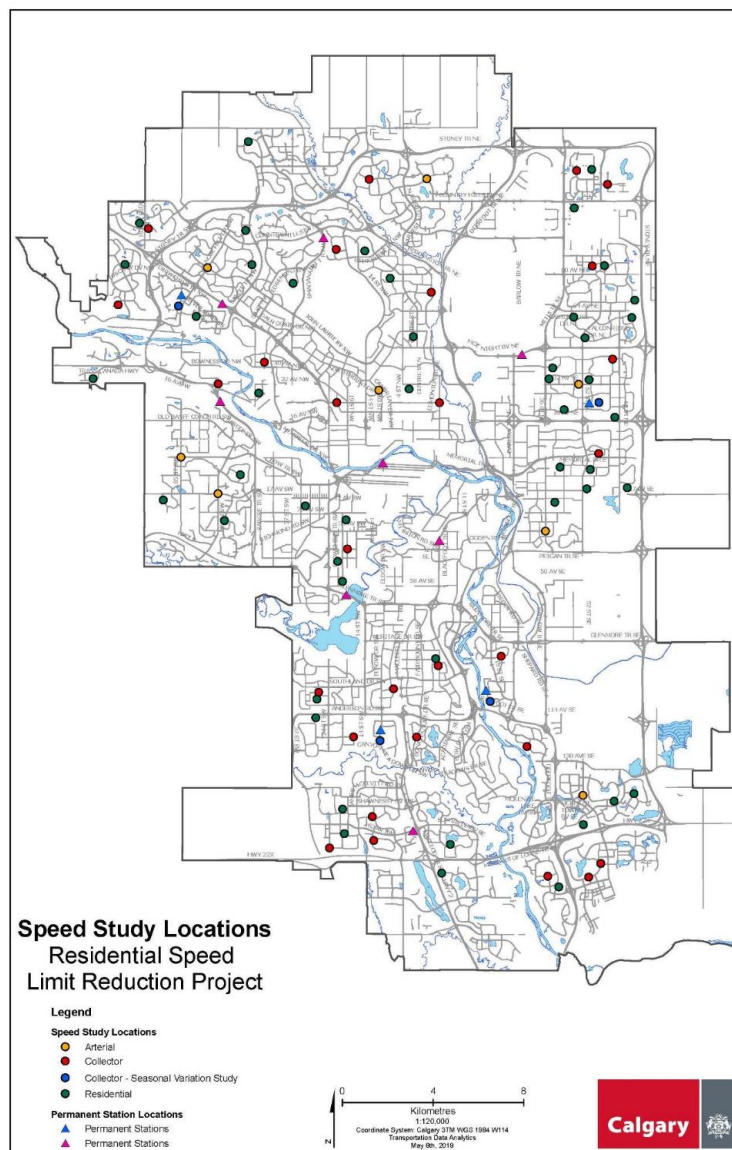
**Support for The City's Decision to Reduce Speed Limits on Some Roads to 40 km/hr**



## Operating Speeds in Neighbourhoods

The Neighbourhood Speed Limit Review collected speed data on Collector and Residential roadways to quantify the nature of the speeding issue and to serve as baseline data. Post-implementation data has been collected at the same locations where the previous studies were completed and provide an early indication of changes in motorist behaviour. The locations of the studies are shown in Figure 3, and more detail is provided in the technical report mentioned previously.

**Figure 3: Neighbourhood Speed Study Locations**



Initial indications from Fall 2021 data collection indicate that operating speeds have decreased on both Residential and Collector roadways. Summary statistics of the speed studies are presented in Table 1. All traffic data, including these speed studies, are publicly available at [trafficcounts.calgary.ca](http://trafficcounts.calgary.ca). The results of these studies and the spring 2022 speed studies, currently under review, will be presented in more detail during the formal evaluation of the Neighbourhood Speed Limits implementation in Q2 2023, as directed by Council.

Residential roadways were found to have an overall reduction in average speed of 1.6 km/h relative to the pre-implementation fall measurements; 85<sup>th</sup> percentile speeds were 2.5 km/h lower which indicates a larger impact on higher level speeds, as expected.

Collector roadways, which largely remained at 50 km/h, were also found to have moderate decreases in speed of 0.6 km/h and 1.7 km/h for average and 85<sup>th</sup> percentile speeds, respectively. These moderations in speed are promising and may suggest that improved compliance on residential roads is also influencing motorist behaviour on Collector roadways.

The modest speed reductions noted above are consistent with expected changes in the Neighbourhood Speed Limit Review report and are expected to continue to improve over time; behaviour change takes time.

**Table 1: Leading indicators of change on Initial speed data following change**

Location	Spring 2019			Fall 2019			Fall 2021		
	Total Obs.	85 <sup>th</sup> ile speed (km/h)	Mean Speed (km/h)	Total Obs.	85 <sup>th</sup> ile speed (km/h)	Mean Speed (km/h)	Total Obs.	85 <sup>th</sup> ile speed (km/h)	Mean Speed (km/h)
	<b>13856</b>			<b>14009</b>			<b>12128</b>		
<b>Arterial Street</b>	<b>8</b>	<b>67.3</b>	<b>57.8</b>	<b>9</b>	<b>67.7</b>	<b>58.4</b>	<b>9</b>	<b>66.6</b>	<b>57.0</b>
	<b>15558</b>			<b>78537</b>			<b>33690</b>		
<b>Collector</b>	<b>2</b>	<b>51.5</b>	<b>42.1</b>	<b>5</b>	<b>52.8</b>	<b>43.0</b>	<b>5</b>	<b>51.1</b>	<b>42.4</b>



<b>Residential Street</b>	<b>23398</b>	<b>45.0</b>	<b>34.7</b>	<b>26640</b>	<b>46.2</b>	<b>35.5</b>	<b>21832</b>	<b>43.7</b>	<b>33.9</b>
---------------------------	--------------	-------------	-------------	--------------	-------------	-------------	--------------	-------------	-------------

## Prioritization of Collectors for Review/Design Changes

There is a need to prioritize the redesign of Collector Roadways given the large network and practical limitations to how quickly the work can be completed (both budget and capacity). Collisions, injury, or fatal collisions in particular, are the key data on which to prioritize the work for consistency with direction from Council. A secondary prioritization metric would naturally be the observed speeds. A focus on objective data will be the most equitable approach to ensure that resources are invested first where there is greatest need and potential impact for an objective and ongoing program.

There are many metrics beyond reductions in collisions and speed as the key objectives for which we have or can collect data. Secondary objectives of increasing active transportation, perceptions of safety, or access/equity may be described by data sets to assist in determining priority for other projects which may not be ranked highly based on collisions and speeds. These data include such items as missing sidewalk links, 311 concerns from citizens related to speed or feelings of safety, transit use etc. While an objective process is possible to prioritize work based on these criteria, there is also a recognized need to be responsive and flexible to requests which may come from citizens, community groups or through the Councillor’s offices from interactions with their constituents.

Prioritization based on the above criteria will provide a solid starting point to focus efforts, and it will be important to maintain flexibility in application. As a specific example, if a community is identified as a top priority that could be constructed in the following year and a major surface overlay is planned within the next few years it would be beneficial to take the opportunity to leverage that work by delaying so the work can be done at the same time. Similarly, if a project is identified as a priority to be rebuilt in four years but there is Surface Overlay work planned within 1 year there would be a good case to advance the Collector redesign work to coordinate the work. Similar

considerations will need to be applied for secondary objectives to ensure flexibility of application while falling within a general framework.

Examples of data sets envisioned for use in the Framework are identified graphically in Figure 4. As additional data sets are considered the approach may be adjusted and refined.

Four themes for prioritization have been identified and are described in Table 2:

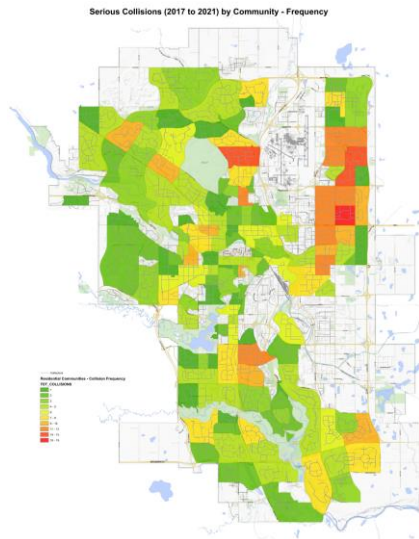
1. Collision Reduction: remaining true to the purpose of the project means prioritizing corridors with safety problems
2. Equity: advancing communities with greater deficiency relative to geometric standards and higher need will balance historic inequity
3. Opportunity: aligning with capital programs will make for a faster overall delivery
4. Alignment: following policy will help guide mobility investment through the benefit of past analysis and engagement

**Table 2: Prioritization themes**

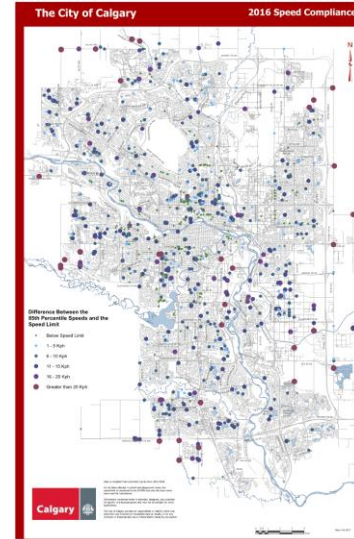
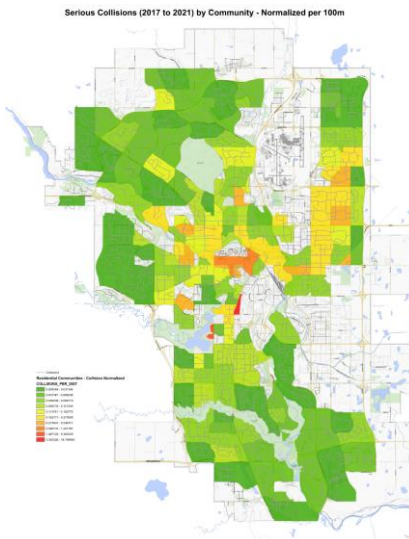
<b>Collision Reduction</b>	<b>Equity</b>	<b>Opportunity</b>	<b>Policy Alignment &amp; Benefits</b>
<i>Measures:</i> Injury Speed	<i>Measures:</i> Roadway deficiencies Need	<i>Measures:</i> Capital programs Asset condition Ease of implementation Redevelopment	<i>Measures:</i> Mobility networks
<i>Metrics:</i> Serious injuries Community age: area-based injury rates Speed Volumes Road width	<i>Metrics:</i> Missing links Transit ridership- Bus frequency as a surrogate Income Access to green space	<i>Metrics:</i> Pavement condition Tree conditions Utility conditions	<i>Metrics:</i> 5A network Primary transit network Complete Streets Policy

Figure 4: Graphical representation of data for prioritization

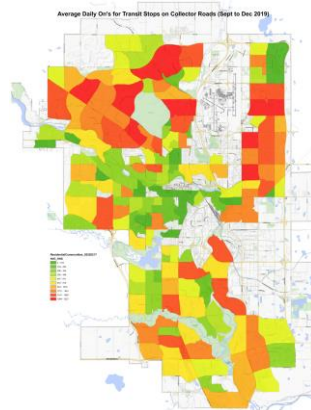
Serious Collisions by Community



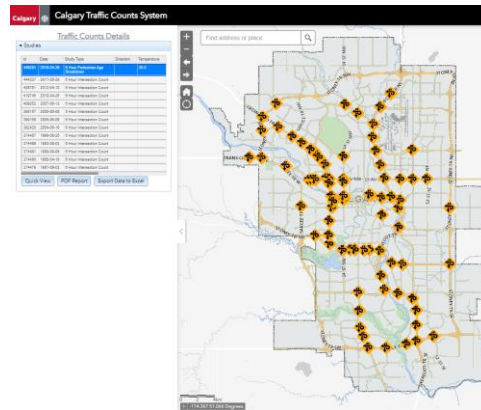
Serious Collisions per 100m Observed Speed Data



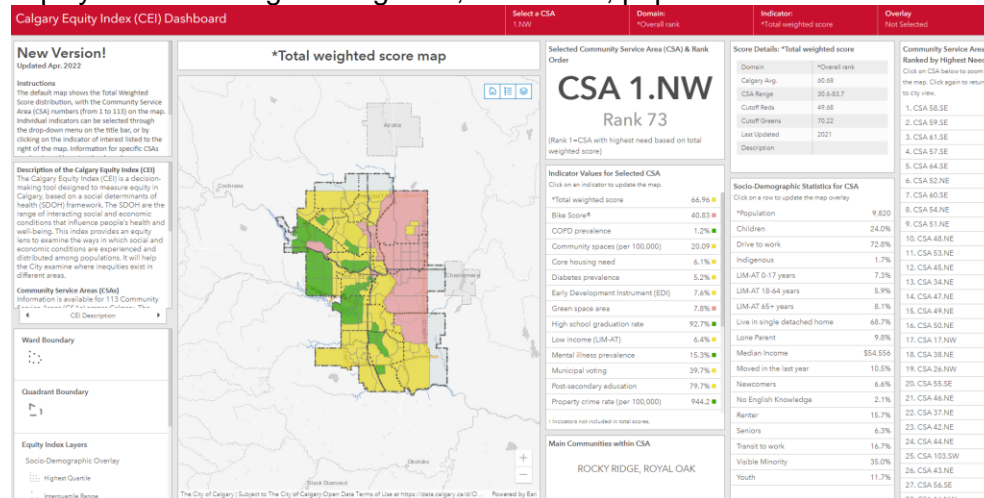
Transit Ridership



Traffic Counts



Equity data including missing links, bike score, population indicators etc.



## Recommended Safer Collector Program to Implement Framework

Three approaches are recommended to implement the prioritized work of the Safer Collector Framework these are: Continued review and change of speed limit where roadway supports 40 km/h, Permanent changes to support lower speeds while starting with temporary to evaluate and confirm design elements to achieve 40 km/h operating speed, and Temporary changes to support lower speeds. These are described in greater detail below and will require flexibility in application, similar to the approach for prioritization.

### **Continued review and signage change of Collectors that already support 40 km/h speed limit**

This first approach will continue the low-cost and high-compliance approach taken during the initial implementation. Further data collection and review of collectors will identify remaining segments that can be reduced to 40 km/h and operate well without physical changes. These changes can be made on an ongoing and immediate basis as reviews are completed. Collectors that do not meet the current criteria can be considered for further changes through permanent or temporary change. Current criteria for Collector roadways to have a 40 km/h speed limit are presented in Figure 5.

Observed changes in operating speeds on Collector roadways following the implementation of the reduced speed limit indicate that there is some background adjustment in driver comfort speeds and compliance. This suggests that a larger number of Collector roadways for which compliance is currently low may have behaviour changes such that compliance would be considered acceptable, and no physical changes would be required to encourage safer speeds.

### Figure 5: Criteria for Collector Roadways to be 50 km/h or 40 km/h

**These criteria will be used to determine if the speed limit will be posted at 50 km/h or if 40 km/h will apply (and may or may not be posted).**

- Roads within Industrial areas and Downtown will remain at their current speed limits.
- Playground Zone signs will remain unaffected (30 km/h from 07:30 to 21:00), but the speed outside of zone hours may change.
- Collector or Neighbourhood Boulevard roadways that have observed speeds consistent with 40 km/h will be left as unposted or posted at 40 km/h as appropriate. As a clear definition: If a speed study is available and the average operating speed is less than 45 km/h, and 85-percentile speed is less than 55 km/h, the speed limit of the roadway will be 40 km/h.
- Collector roadways and Neighbourhood Boulevards that serve a collector function (connect multiple residential roads to arterial roads), provide a connection to another collector roadway or loop back to itself, or carry high traffic volumes (>2000 vehicles/day) are all appropriate to sign at 50 km/h.
- Collectors will not be posted at 50 km/h unless they are 500 metres or longer. If an uninterrupted (i.e. no Playground Zone or stop control) length of a collector is greater than 500 m, it will be posted as 50 km/h. If a road is less than 500 metres, but connects to two higher class roadways and satisfies other criteria (on this list), it will be posted at 50 km/h.
- Cul-de-sacs will not have a posted speed limit. A collector road, with a median, that connects to a cul-de-sac will also not have a posted speed limit.
- Calgary Transit will be consulted for collectors that otherwise would not meet the above criteria but serve a bus route. Collectors with bus routes which have been identified for on-demand transit service will not be posted at 50 km/h unless other criteria are met to post the speed limit at 50 km/h.

### Permanent changes on Collector roadways to support lower speeds

This second approach will prioritize neighbourhoods for Collector roadway reconstruction to new 40 km/h design standards based on the Collision Reduction them in terms of collision and speed data to ensure capital investment is focused where there is the greatest objective need and potential benefit. Adjustments to the prioritization will be made where appropriate to coordinate with other major capital programs. A dedicated program to re-build collectors to the new 40 km/h design standard over time can address a long-standing issue for citizens but will require new capital investment. There may also be opportunities for increased investment in renewal programs in communities such as the pavement surface overlay program to physically change the roadway to the new design standard being developed in the Design Guideline for Subdivision Servicing. Temporary measures will be used during initial years of the program to evaluate and fine tune geometric design standards to confirm that the

expected 40 km/h operating speed outcomes are achieved. Adjustments made to geometric elements such as curb extensions at intersections or mid-block locations, speed humps/cushions, can then be made permanent with increased confidence that the investment will result in the desired outcomes.

### **Temporary changes on Collector roadways to support lower speeds**

This third approach will be flexible and responsive to opportunities, supporting equity of City work and aligning with other programs such as Neighbourhood Streets and the 5A network. This responsive approach can support policy using lower-cost temporary measures until permanent changes would be possible. While these neighbourhoods may not be prioritized based on objective collision or speed data, interim measures can advance some benefits citizens may expect with eventual permanent changes.

### **Plan for data collection and evaluation**

Progress on redesigning collectors will be evaluated based on observed speed changes and collisions. The City is continuing to expand the use of video based conflict analysis and will do so when/where appropriate. As the program proceeds the level of effort required to achieve the desired outcomes will be refined. There may also be background changes in behaviour as motorists become more comfortable with the default speed limit of 40 km/h and compliance may improve – this presents opportunity to reduce speed limits on collector roads without further investment in infrastructure.

### **Recommended Budget for the Safer Collector Program**

The Safer Collector Program will be a new effort to improve the safety and livability of neighbourhoods in Calgary. Administration recommends a moderate start to the program to ensure time for initial evaluations and adjustments to ensure we are achieving objectives prior to intensified investment. The recommended investment in the initial four years of the capital program would result in an average of 5 communities being built with permanent measures, 5 communities with temporary measures, and

adjustments to appropriate collector roadways where physical changes are not needed; this level of effort would result in reconstruction in every neighbourhood over 40 years. Evaluation and assessment of behaviour may support increased investment, or potentially reduced investment as behaviour change occurs over decades.

Permanent construction is recommended on collector roads in 5 neighbourhoods per year to make 40 km/h a credible speed limit (prioritized based on Collisions Reduction). Another 5 communities would be treated with temporary measures, such as traffic calming curbs etc., based on Equity, Opportunity, and Alignment themes to be responsive to community requests (concerned communities eager to adopt, speeding issues with low collision frequency, political pressure, etc.). This would result in no longer than a 40-year cycle to rebuild collectors as needed in all neighbourhoods in the city.

The budget suggested below is a Class 5 Estimate based on doubling the investment per neighbourhood that was made in the neighbourhood of Erin Woods as a case study and will depend on the specific treatments adopted in the updated design standards. Traffic Calming in Erin Woods is a useful case study since work on the collectors was done using both Temporary and Permanent approaches.

Recommended investment in Capital program for Safer Collector Program\*:

Temporary materials for year 1 - \$4M (10 communities)

Temporary materials and permanent changes for year 2 - \$8M (10 communities)

Temporary materials for year 3 and 4 - \$1M/year (5 communities @\$200K)

Permanent changes (in year 3 onward) - \$15M/year (5 communities @\$3M)

Data collection/evaluation (\$300k per year)

Total annual request for year 1 of Safer Collector Program work \$4M

Total annual request for year 2 of Safer Collector Program work \$8M

Total annual request for year 3 and 4 of Safer Collector Program work \$16.3M

\*Investment may be focused on end of program after initial evaluations and adjustments.