

Encl 2 Glen Allan Traffic Calming - 2018 Project Update Report.docx

2018 Project Update

Prepared by Tahir Hameed and Debbie Rawson

This report provides an update on the Glen Allan Traffic Calming project, including engineering and resident assessment of the features installed to date, as well as revised plans for remaining traffic calming locations.

Executive Summary

No construction was planned for the Glen Allan traffic calming project area in 2018, which provided Strathcona County the opportunity to conduct a mid-term evaluation of the project to date. Due to unforeseen underground infrastructure needs identified during the detailed design process, updated cost estimates to construct the approved plans at some locations have increased since originally estimated during the conceptual design. In addition, there have been resident and constructability concerns identified with the raised intersections on Glenbrook Boulevard.

This 2018 evaluation was undertaken with the purpose of ensuring the remaining traffic calming planned in Glen Allan is completed in a manner that is economically viable, technically feasible and publically acceptable.

This project included an engineering evaluation of speed and volume data on sections of roads that had traffic calming features installed, as well as in locations awaiting the installation of features. Resident engagement exploring opinions on locations where traffic calming has already been installed, as well as potential options for traffic calming going forward was also undertaken. Finally, revised traffic calming plans for the project were developed based on the results of the engineering and resident engagement.

Resident evaluations of the features installed to date showed a range of satisfaction. Most notably, residents were very unhappy with the raised intersections on Glenbrook Boulevard. As a result, the raised intersections on Glenbrook Boulevard will be regraded as part of the road rehabilitation planned in 2019. Final implementation of the raised intersections will provide the traffic calming effect strongly desired by local residents while reducing driver frustration due to inconsistent construction.

Generally, the other traffic calming features completed in Glen Allan to date were more acceptable to residents, excepting curb extensions, which the majority of residents opposed. There is a significant portion of respondents (consistently about 25%-30%), who simply oppose the addition of traffic calming in any form.

With approximately half of the traffic calming plans in Glen Allan implemented to date, traffic data collection generally shows reduced traffic speeds at locations in Glen Allan still awaiting the addition of features. This observed speed reduction has allowed engineers to put forward revised traffic calming plans that are more economical and less aggressive to be more in line with resident feedback.

Overall, the revised traffic calming plans have resulted in a net savings of \$835,000 over the original cost of the 2015 implementation plan at the remaining locations. This represents a decreased budget of more than 60%, despite the addition of the traffic management features at the intersection of Georgian Way and Granada Boulevard that are not a function of traffic calming.

No change is expected to the implementation of the revised plans. All features on Georgian Way are planned for construction in 2019. A full rehabilitation of Glenbrook Boulevard will also be completed in 2019, including revision of the raised intersections. Once these construction projects are completed, the neighbourhood speed limit will be reduced to 40 km/h as planned in 2015. Permanent driver feedback signs will also be installed on Galaxy Way in 2019 in place of the proposed physical traffic calming features. Rehabilitation of Graham Road, including the crosswalk upgrades, is planned for 2021.

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1.0 Introduction

1.1 Project Background

The Glen Allan neighbourhood, and in particular, Glenbrook Boulevard, has a long history of resident concern about speeding, pedestrian safety and shortcutting to the Mall.

In 2015, speed and volume data collected in the neighbourhood indicated there were many locations where drivers were travelling in excess of the 50 km/h speed limit. For these reasons, an engineering-driven traffic calming project was initiated for these roads according to the Traffic Calming Policy SER-009-040.

The Glen Allan Traffic Calming Plan was developed and approved following an extensive public engagement process that took place from March to September of 2015. Final recommendations and conceptual plans were officially approved at the October 20, 2015 Council Meeting.

To date, the following parts of the traffic calming plan have been implemented:

- Traffic calming has been completed on Galloway Drive and Gatewood Boulevard.
- All-way stop control has also been added at the intersections of Georgian Way with Glenbrook Boulevard and Gatewood Boulevard.
- Raised intersections on Glenbrook Boulevard at Galloway Drive and Gilmore Avenue have been constructed.

Unfortunately, at some locations, updated cost estimates to construct the approved plan have turned out to be more than the conceptual estimates originally developed due to unforeseen underground infrastructure needs. In addition, there have been resident and constructability concerns with the raised intersections on Glenbrook Boulevard.

1.2 Mid-Term Evaluation

No construction was planned for the traffic calming project area in 2018, which gave Strathcona County the opportunity to conduct a mid-term evaluation of the project to date. This purpose of this evaluation is to ensure remaining traffic calming in the neighbourhood is completed in a way that is economically viable, technically feasible and publically acceptable.

Traffic calming features throughout the neighbourhood have been designed to work together, so the full impact of the project cannot truly be evaluated until all features are in place and the speed limit has been reduced. Ultimately, collision records will also be a significant component of the evaluation, but this will take a few years to evaluate as collision numbers in the neighbourhood are very low.

This project included four stages:

1. Stage One: Preliminary engineering evaluation. This involved the collection of speed and volume data over a two day period in April 2018 in locations where traffic calming features have been installed, as well as in locations awaiting the installation of features.

2. Stage Two: Development of potential options for alternative traffic calming plans based on engineering assessment and resident input from 2015 open house and ongoing feedback to the spring 2018.
3. Stage Three: Resident engagement exploring opinions on locations where traffic calming has already been installed, as well as potential options for traffic calming going forward. Public engagement for this evaluation was conducted at the “Listen and Learn” level, and included an open house and online survey. See the companion document, *Glen Allan Traffic Calming Project – 2018 Update: Open House and Online Survey Report* for full results of this engagement.
4. Stage Four: Development of revised traffic calming plans for the project based on the results of the engineering and resident engagement.

1.3 Structure of this Report

Section 2.0 of this report provides a summary of the engineering and resident engagement results for traffic calming installed to date. Section 3.0 outlines plans for the remaining traffic calming locations in Glen Allan.

2.0 Evaluation of Traffic Calming Installed to Date

2.1 Glenbrook Boulevard

Concerns on Glenbrook Boulevard were the starting point for the Glen Allan Traffic Calming Project. Addressing speed, volume and pedestrian concerns on this road was the main focus of this project from both a resident and engineering perspective.

All-way stop control was introduced at the intersection of Glenbrook Boulevard with Georgian Way in the fall of 2015. Because of the high priority of this location, raised intersections and curb extensions were constructed on Glenbrook Boulevard at Galloway Drive and Gilmore Avenue in 2016, although full rehabilitation on Glenbrook Boulevard is not scheduled until 2019. Unfortunately, due to construction challenges the intersections had to be reconstructed, most recently in October 2017.

Engineering Evaluation

Engineering data collected in 2015 supported resident concerns with traffic safety on Glenbrook Boulevard. Data collected in 2018 shows a large speed reduction in both directions. Volume was reduced 15% in the northbound direction, whereas it was 7% higher in the southbound direction.

Table One: Traffic Volumes on Glenbrook Boulevard Before/After Traffic Calming

Direction of Travel	Traffic Volume (veh/day)			
	2015	2018	Increase (+) Decrease (-)	% Change
Northbound	2880	2444	-436	-15.14%
Southbound	2215	2377	162	7.31%

Table Two: Traffic Speed on Glenbrook Boulevard Before/After Traffic Calming

Direction of Travel	85th Percentile Speed (km/h)*			
	2015	2018	Increase (+) Decrease (-)	% Change
Northbound	57.7	50.0	-7.7	-13.34%
Southbound	64.0	49.4	-14.6	-22.81%

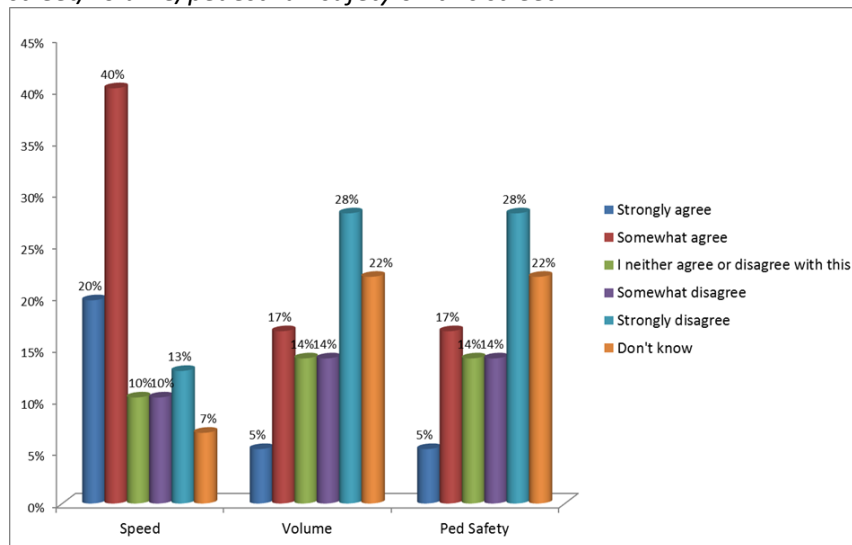
*85th percentile speed is the speed at which 85% of drivers are driving at or below. Ideally, 85th percentile speed is very close to the speed limit.

Resident Evaluation

Resident evaluation was also an important consideration in this evaluation. Resident feedback is important to help us understand how the traffic calming affects daily resident experience in their community. Traffic data collection is done over 2-3 days and represents a snapshot in time. Traffic volumes in particular can vary day to day. It also does not capture nuances such as noise and driver behaviour.

While the majority of residents agreed that the traffic calming has decreased speeds on Glenbrook Boulevard, the majority disagreed that the measures have decreased volumes or improved pedestrian safety (see Figure One). A few residents appreciate the aggressive nature of the raised intersections, but the vast majority feel the features are poorly constructed, overdone and potentially damaging to vehicles.

Figure One: Based on your personal experience, please indicate your level of agreement with the following statements: Traffic calming features on Glenbrook Boulevard have decreased speeds on this street/volume/pedestrian safety on this street.



Conclusion

With multiple traffic generators (two schools, Glen Allan Recreation Complex, Sherwood Park Mall) located in Glen Allan, traffic volumes likely vary a lot, depending on what is happening at these locations. Decreased volumes recorded in the northbound directions (accompanied with decreased volumes collected on Georgian Way westbound) suggest fewer people were accessing the mall via this route on the dates data was collected. However, resident experience of traffic volume is not decreased. This could be because average volumes have not changed or because the increased traffic noise caused by the raised intersections increases resident perceptions of traffic volumes.

Undoubtedly, speed on Glenbrook Boulevard has been reduced considerably. This is confirmed by both resident report and speeds recorded through data collection. Although at odds with resident perception, lower speeds combined with the safety benefits provided by curb extensions suggest that pedestrians are at far lower risk today on Glenbrook Boulevard than they were in 2015. While many residents indicated that traffic speeds up between the raised intersections, almost everyone noted that drivers need to slow to at least 20 km/h to navigate the features, which are located at crosswalk locations and

data is collected between raised features in an attempt to capture maximum travel speeds. Research unequivocally shows that there is a strong statistical association between speed and pedestrian safety¹.

Despite the effectiveness of the features in managing speed and pedestrian safety on Glenbrook Boulevard, it is clear that the construction of the features is not acceptable to the vast majority of residents, and that steps need to be taken to address these concerns.

As a result, the raised intersections on Glenbrook Boulevard will be reconstructed regraded with the planned 2019 road rehabilitation. Final implementation of the raised intersections will provide the traffic calming effect strongly desired by local residents while reducing driver frustration due to inconsistent construction.

2.2 Galloway Drive

Engineering Evaluation

The key community concerns on Galloway Drive were pedestrian safety, traffic speeds and short-cutting traffic increasing volumes. From an engineering perspective, data collection in 2015, found volumes to be well within what would be expected on a collector road, but with traffic speeds slightly higher than expected, particularly in the westbound direction. Data collection in 2018 shows a reduction in both speeds and volumes on Galloway Drive, particularly in the eastbound direction.

Table Three: Traffic Volumes on Galloway Drive Before/After Traffic Calming

Direction of Travel	Traffic Volume (veh/day)			
	2015	2018	Increase (+) Decrease (-)	% Change
Eastbound	1296	1130	-166	-12.81%
Westbound	1246	1201	-45	-3.61%

Table Four: Traffic Speed on Galloway Drive Before/After Traffic Calming

Direction of Travel	85th Percentile Speed (km/h)			
	2015	2018	Increase (+) Decrease (-)	% Change
Eastbound	53.3	48.7	-4.6	-8.63%
Westbound	57.8	57.4	-0.4	-0.69%

*85th percentile speed is the speed at which 85% of drivers are driving at or below. Ideally, 85th percentile speed is very close to the speed limit.

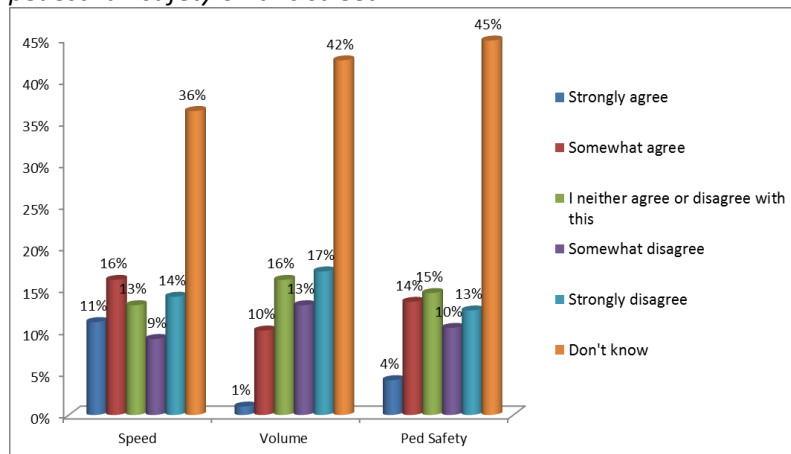
¹ Rune Elvik, Peter Christensen, Astrid Amundsen, Speed and road accidents: an evaluation of the Power Model, Oslo 2004 available at <https://www.toi.no/getfile.php/131013/Publikasjoner/T%C3%98I%20rapporter/2004/740-2004/Repsumm.pdf>

Resident Evaluation

Resident opinions of the outcomes of the Galloway Drive traffic calming features were very mixed. Many residents did not express an opinion on these questions, reporting they do not use the road. A slight majority of residents who expressed an opinion agreed that the traffic calming has decreased speeds on Galloway Drive, and a slight majority of residents disagreed that the measures have decreased volumes on the street or improved pedestrian safety. Many chose a neutral response.

The majority of surveys did not contain comments about Galloway Drive. The ones that did tended to be negative about the features. Some commented that the speed humps were not aggressive enough to slow traffic. Several comments indicated that the curb extensions have narrowed the road too much and that they felt this decreased safety.

Figure Two: *Based on your personal experience, please indicate your level of agreement with the following statements: Traffic calming features on Galloway Drive have decreased speeds/traffic volume/pedestrian safety on this street.*



Conclusion

To date, preliminary engineering and resident data indicate there has been a small reduction of speed on Galloway Drive. More time for data collection will allow for a better understanding of the outcomes. Residents who are unhappy with traffic calming on Galloway Drive tend to be so because of the addition of curb extensions. Curb extensions narrow the road to reduce the crossing distance for pedestrians and to support lower speeds by forcing opposing vehicles to more closely pass each other.

2.3 Gatewood Boulevard

The key community concern on Gatewood was pedestrian safety, particularly at the crosswalk near the west mall entrance. From an engineering perspective, no concerns were noted on Gatewood Boulevard during the 2015 project.

Engineering Evaluation

Data collection found somewhat increased speeds and a higher volume in eastbound traffic (however still within expected volumes for the road classification). This could be related to lower volumes on Glenbrook Blvd.

Table Five: Traffic Volume on Gateway Boulevard Before/After Traffic Calming

Direction of Travel	Traffic Volume (veh/day)			
	2015	2018	Increase (+) Decrease (-)	% Change
Eastbound	1959	2709	750	38.28%
Westbound	2757	2706	-51	-1.85%

Table Six: Traffic Speed on Gateway Boulevard Before/After Traffic Calming

Direction of Travel	85th Percentile Speed (km/h)			
	2015	2018	Increase (+) Decrease (-)	% Change
Eastbound	48.2	52.2	4.0	8.30%
Westbound	46.8	52.1	5.3	11.32%

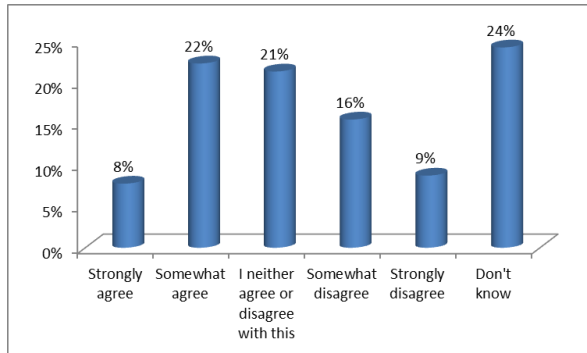
*85th percentile speed is the speed at which 85% of drivers are driving at or below. Ideally, 85th percentile speed is very close to the speed limit.

Resident Evaluation

Residents were asked to indicate to what extent they feel traffic calming features installed on Gatewood Boulevard have impacted pedestrian safety.

A slight majority of residents agreed that the traffic calming has improved pedestrian safety on Gatewood Boulevard. Few residents felt strongly about these features, with most choosing Somewhat Agree, Neutral, Somewhat Disagree or Don't Know responses.

Figure Three: *Based on your personal experience, please indicate your level of agreement with the following statement: Traffic calming features on Gatewood Boulevard have improved pedestrian safety on this street.*



Conclusion

Given the evidence regarding the pedestrian safety benefits of providing a pedestrian refuge island and the tendency of residents to agree that pedestrian safety is improved, preliminary evaluation seem to suggest a safety improvement. Ongoing speed monitoring at this location will be needed to confirm the safety benefits of traffic calming on Gatewood Boulevard.

Residents were generally more positive about the use of the median islands to improve pedestrian safety than the use of curb extensions.

3.0 Recommendations for Traffic Calming at Remaining Locations

Although these roads have not yet had traffic calming installed, traffic data was collected to assess how traffic calming installed to date has affected these locations.

3.1 Georgian Way (Glenbrook Boulevard to Gatewood Boulevard)

Engineering Evaluation

Data collected in 2018 shows a marked decrease in speeds and volumes recorded on the section of Georgian Way between the two all-way stops.

Table Seven: Traffic Speed/Volume on Georgian Way (Glenbrook Blvd. to Gatewood Blvd.) 2015 & 2018

Direction of Travel	Traffic Volume (vehicles/day)				85th Percentile Speed (km/h)*			
	2015	2018	Increase (+) Decrease (-)	% Change	2015	2018	Increase (+) Decrease (-)	% Change
Eastbound	1989	1658	-331	-16.64%	60.0	54.8	-5.2	-8.67%
Westbound	1945	1545	-400	-20.57%	60.0	53.5	-6.5	-10.83%

*85th percentile speed is the speed at which 85% of drivers are driving at or below. Ideally, 85th percentile speed is very close to the speed limit.

Resident Evaluation

As a result of the decreases in speed and volumes observed at this location, and based on resident feedback, two potential engineered options were developed to the previously approved traffic calming plans created in 2015. The first of these revised options replaced the raised intersections in the old plan with equally spaced speed humps, while maintaining the curb extensions. The second option was less aggressive, eliminating the curb extensions and maintaining only the equally spaced speed humps along the corridor. All three options presented to residents are included in Appendix One.

Option C: Speed Humps Only was the most strongly supported option, with 49% of residents indicating they supported this option; however, 46% of residents indicated they did not. Those who did not support the option, tended to do so more strongly than those who supported it.

Revised Traffic Calming Plan

Based on the engineering data collected, as well as resident feedback, the following traffic calming plan, consisting of the addition of 3 speed humps, has been selected for the northwest section of Georgian Way. This plan is considered the best option to balance resident demands to limit the cost of the project and the use of curb extensions, while still providing some physical deterrents to speed. The speed humps to be constructed will be similar to those that have been constructed on Galloway Drive.

It is estimated this revised traffic calming plan will cost \$30,000 and will result in an approximate cost savings of \$135,000 from the 2015 plan.

Figure Four: Revised Traffic Calming Plan for Georgian Way (Glenbrook Blvd. to Gatewood Blvd.)



3.2 Georgian Way (Gatewood Boulevard to Granada Boulevard)

Engineering Evaluation

Data collected in 2018 shows a marked decrease in speeds recorded on the section of Georgian Way in the northbound direction; however, there is a small increase in speed in the southbound direction.

Volumes are decreased in the southbound direction, but increased in the northbound direction.

Table Eight: Traffic Speed/Volume on Georgian Way (Gatewood Blvd. to Granada Blvd.) 2015 & 2018

	Traffic Volume (vehicles/day)				85th Percentile Speed (km/h)*			
	2015	2018	Increase (+) Decrease (-)	% Change	2015	2018	Increase (+) Decrease (-)	% Change
Northbound	1370	1785	415	30.29%	74.1	57.1	-17.0	-22.94%
Southbound	2047	1659	-388	-18.95%	56.8	59.1	2.3	4.05%

*85th percentile speed is the speed at which 85% of drivers are driving at or below. Ideally, 85th percentile speed is very close to the speed limit.

Resident Evaluation

The previously approved traffic calming option created in 2015 was not presented as an option during the 2018 resident engagement. Due to unforeseen underground infrastructure needs, the updated cost estimate to construct the approved plan was more than double the estimated cost (approximately \$1.3 Million). Implementation at this cost was not budgeted and needed to be revised.

As a result of the decreases in speed and volumes observed at this location, and based on resident feedback, two potential engineered options were developed to the previously approved traffic calming plan created in 2015. The first of these replaced the raised intersections in the old plan with equally spaced speed humps, while maintaining the curb extensions. Road narrowing was also eliminated. The second option was less aggressive, eliminating the curb extensions at all locations other than the pedestrian crossing and maintaining only the speed humps (6). Both options presented to residents are included in Appendix One. All plans retained the addition of the multi-use path.

Option B: Speed Humps/Multi-Use Path/Curb Extensions only at Crosswalk Only was the most strongly supported option, with 55% of residents indicating they supported this option; however, 40% of residents indicated they did not. Those who did not support the option, tended to do so more strongly than those who supported it. Several residents indicated there were too many speed humps in the plan.

Revised Traffic Calming Plan

Based on the engineering data collected, as well as resident feedback, the following traffic calming plan, consisting of the addition of 3 speed humps, has been selected for the south west section of Georgian Way. This plan is considered the best option to balance resident demands to limit the cost of the project and the use of curb extensions, while still providing some physical deterrents to speed at this location. The speed humps to be constructed will be similar to those that have been constructed on Galloway

Drive. Based on resident feedback, the number of speed humps in the final plan has been reduced from six to three.

The addition of the multiuse trail has also been eliminated from the plans. Although residents generally supported the addition of this feature, it was originally conceived to connect with the Sherwood Park Mall's planned pedestrian access off Georgian Way. As the Mall's plans have not gone forward, available facilities for vulnerable road users will be reconsidered to align with final development on the Mall site.

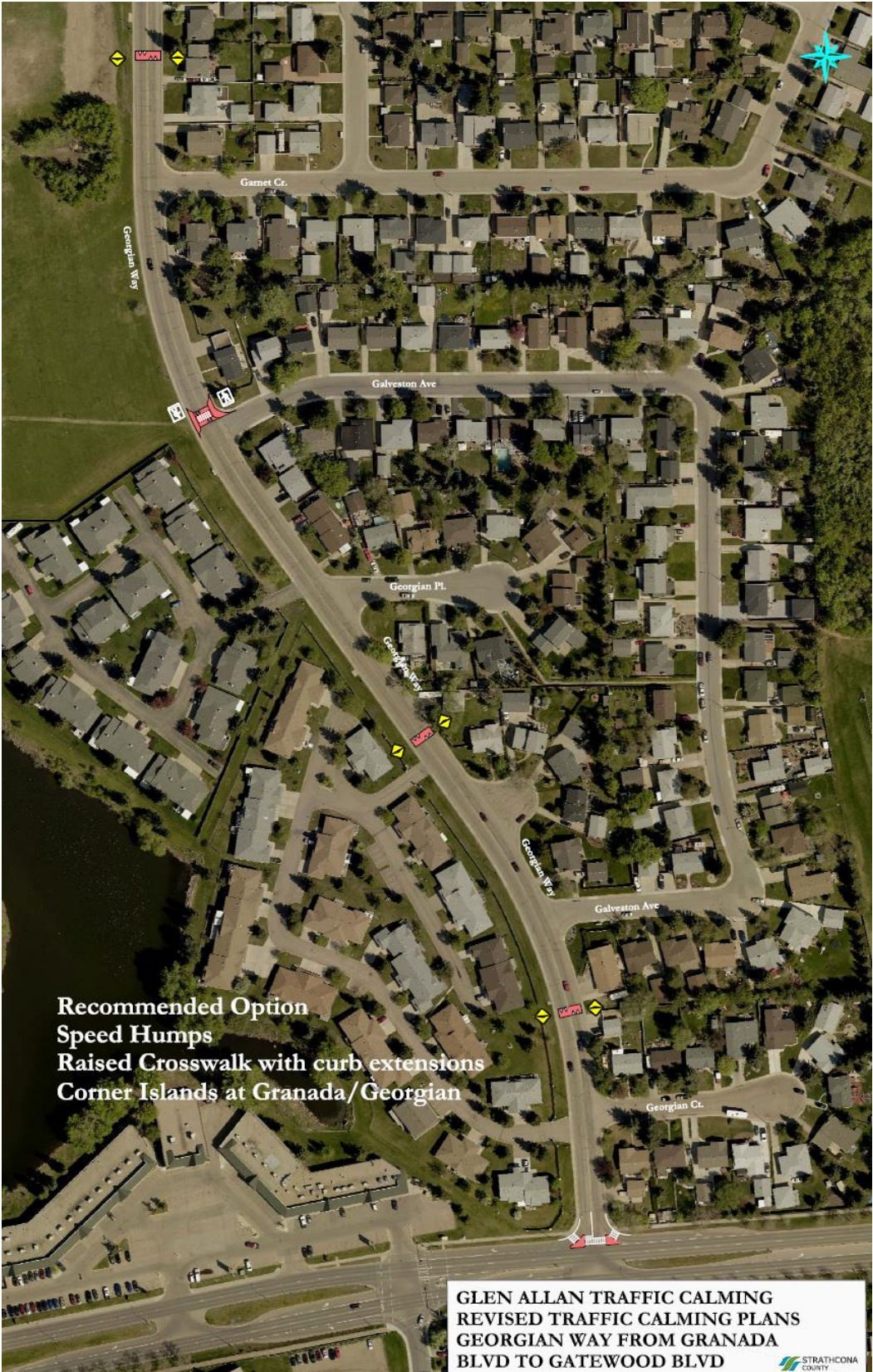
While intersections of collector roads and arterial roads fall outside the scope of neighbourhood traffic calming, they have a greater statistical likelihood for serious pedestrian collisions than intersections within neighbourhoods. During the original engagement on the Glen Allan Traffic Calming Project, several residents also indicated they were concerned with pedestrian safety at the intersection of Granada Boulevard and Georgian Way (West). Road user behaviour, the high proportion of senior and young road users, and limited visibility due to fences near the intersection, make this a higher risk location. For these reasons, pedestrian safety and traffic control improvements have been added to the construction plans for the west leg of Georgian Way.

It is estimated that these improvements will add approximately \$20,000 to the cost of the project. The estimated cost of the revised traffic calming plan for this section of Georgian Way is \$125,000. This revised traffic calming plan will result in a cost savings of approximately \$400,000 from the 2015 plan.

Figure Ten: Planned Pedestrian Safety Improvements at Granada Boulevard/Georgian Way (West)



Figure Five: Revised Traffic Calming Plan for Georgian Way (Glenbrook Blvd. to Gatewood Blvd.)



3.3 Galaxy Way

Engineering Evaluation

Data collected in 2018 shows a marked decrease in speeds and volumes recorded on Galaxy Way.

Table Nine: Traffic Speed/Volume on Galaxy Way 2015 & 2018

	Traffic Volume (vehicles/day)				85th Percentile Speed (km/h)*			
	2015	2018	Increase (+) Decrease (-)	% Change	2015	2018	Increase (+) Decrease (-)	% Change
Northbound	415	309	-106	-25.54%	55.0	52.0	-3.0	-5.45%
Southbound	274	258	-16	-5.84%	61.8	59.1	-2.7	-4.37%

*85th percentile speed is the speed at which 85% of drivers are driving at or below. Ideally, 85th percentile speed is very close to the speed limit.

Resident Evaluation

As a result of the decreases in speed and volumes observed at this location, and based on resident feedback, engineers developed one potential option to the previously approved traffic calming plan created in 2015. This option replaced the raised intersection in the 2015 plan with speed humps. Both options presented to residents are included in Appendix One.

Option B: Speed Humps was the most strongly supported option, with 47% of residents indicating they supported this option; however, 40% of residents indicated they did not. Those who did not support the option, tended to do so more strongly than those who supported it.

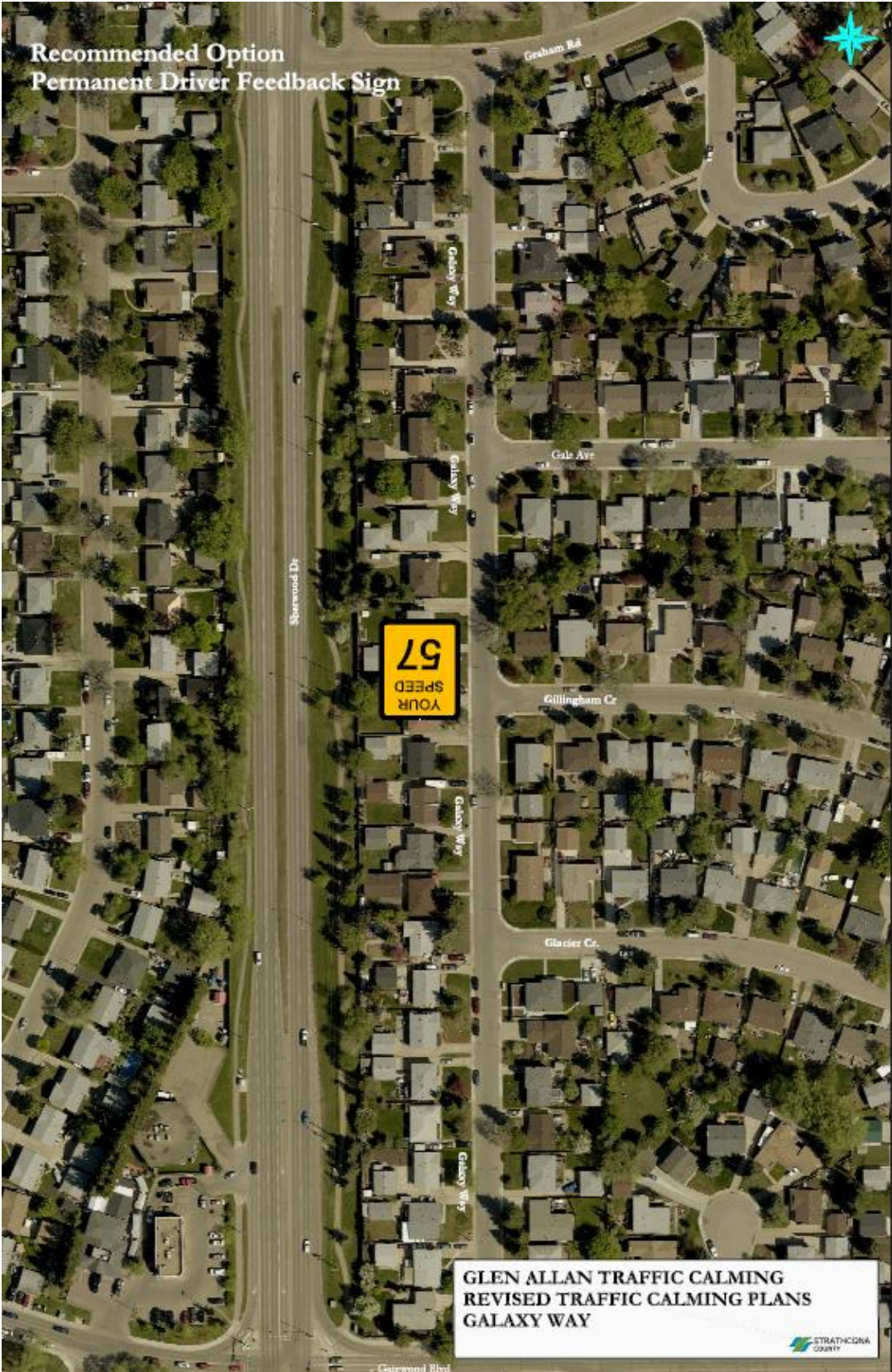
Only two residents participated in the engagement and identified living on Galaxy Way. One strongly did not support either option, and the other did not respond to this question. Comments were again quite mixed with some residents supporting speed humps and others not. The majority of comments were against any features on Galaxy Way and many residents indicated they thought it was a waste of money.

Revised Traffic Calming Plan

Based on the engineering data collected, as well as resident feedback, the following traffic calming plan, consisting of the addition of a permanent driver feedback sign in the southbound direction, has been selected for Galaxy Way. This plan is considered the best option to balance resident opposition to the project, while still providing some deterrent to speed at this location.

The estimated cost of the revised traffic calming plan is \$10,000. This revised traffic calming plan will result in an approximate cost savings of \$35,000 from the 2015 plan.

Figure Six: Revised Traffic Calming Plan for Galaxy Way



3.4 Graham Road

Engineering Evaluation

Data collected in 2018 shows a marked decrease in speeds and volumes recorded on Graham Road.

Table Ten: Traffic Speed/Volume on Graham Road 2015 & 2018

	Traffic Volume (vehicles/day)				85th Percentile Speed (km/h)*			
	2015	2018	Increase (+) Decrease (-)	% Change	2015	2018	Increase (+) Decrease (-)	% Change
Eastbound	468	383	-85	-18.16%	57.3	49.9	-7.4	-12.91%
Westbound	561	428	-133	-23.71%	62.9	51.2	-11.7	-18.60%

*85th percentile speed is the speed at which 85% of drivers are driving at or below. Ideally, 85th percentile speed is very close to the speed limit.

Resident Evaluation

As a result of the decreases in speed and volumes observed at this location, and based on resident feedback, engineers developed two potential options to the previously approved traffic calming plan created in 2015. The first of these replaces the raised intersections in the old plan with speed humps, while maintaining the curb extensions. The second option is less aggressive, maintaining curb extensions only at the crosswalks and at Glenbrook Boulevard, and maintaining the speed humps. All three options presented to residents are included in Appendix One.

Option C: Raised Crosswalk/Speed Humps/Curb Extensions at Crosswalk and Major Intersection was the most strongly supported option. However, only 40% of residents indicating they supported this option, while 51% of residents indicated they did not. Those who did not support the option, tended to do so more strongly than those who supported it.

Six residents participated in the engagement and identified living on Graham Road. Two supported traffic calming strongly, two supported Option C only, and two did not support traffic calming at all. Although mixed, generally comments mirrored the proportions in the quantitative results, with the majority of residents feeling traffic calming was unwarranted on this road. There was a strong sentiment against curb extensions.

Revised Traffic Calming Plan

Based on the engineering data collected, as well as resident feedback, scaled back traffic calming plan, consisting of only curb extensions and a raised crosswalk, has been selected for Graham Road. This plan is considered the best option to balance resident opposition to the project, while still providing some improved pedestrian safety at this location. Basically, this plan corresponds simply to the implementation of the Neighbourhood Traffic Safety Action Plan.

The estimated cost of the revised traffic calming plan is \$50,000. This revised traffic calming plan will result in a cost savings of approximately \$185,000 from the 2015 plan.

Figure Seven: Revised Traffic Calming Plan for Graham Road



3.5 Georgian Way/Glenbrook Blvd and Georgian Way/Gatewood Boulevard Intersections

All-way stop control was implemented at the Georgian Way/Glenbrook Blvd and Georgian Way/Gatewood Boulevard Intersections in 2015. Previously approved plans called for the intersections to also be raised with the next rehabilitation. During the public engagement, 81% of residents supported the removal of the raised intersections from the plans.

Revised Traffic Calming Plans

Based on the engineering data collected, as well as resident feedback, the following traffic calming plan has been selected for Georgian Way. The raised intersections have been removed from the plans and the curb extensions on the straight portion of the intersection have been reduced to minimize impact to adjacent residents and to emphasize the pedestrian crossing. This plan is considered the best option to balance resident demands to limit the cost of the project and optimize the use of curb extensions, while still providing some physical features to reduce intersection width at these locations.

The estimated cost of the revised traffic calming plans including both locations is \$230,000. These revised traffic calming plans will result in a cost savings of approximately \$100,000 from the 2015 plans.

Figure Eight: Revised Traffic Calming Plan for the Intersection of Georgian Way and Glenbrook Blvd.

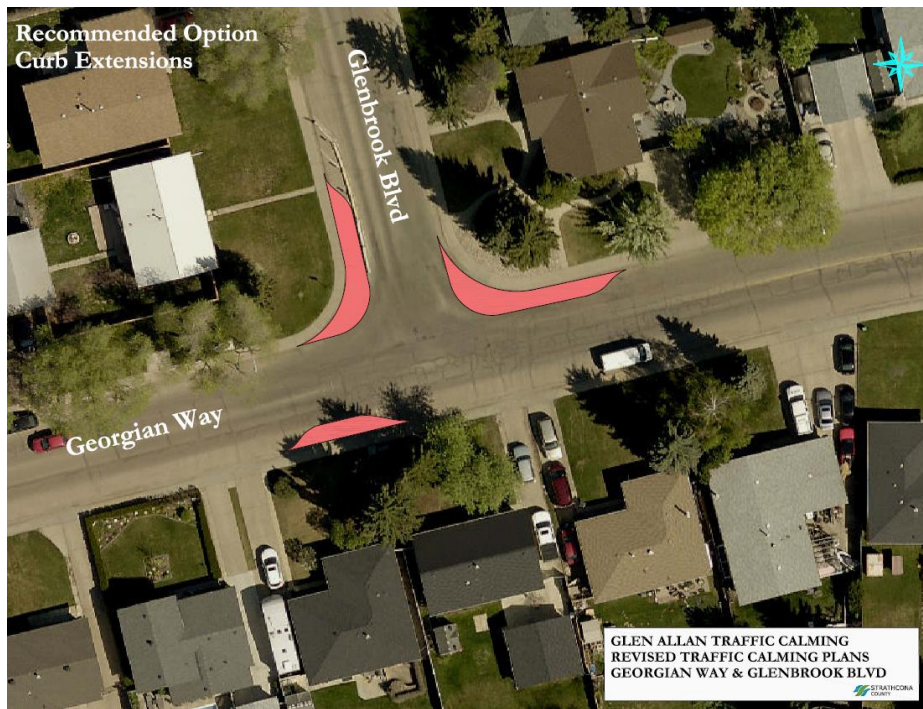


Figure Nine: Revised Traffic Calming Plan for the Intersection of Georgian Way and Gatewood Blvd.



3.6 Implementation Plan

No change is expected to the implementation of the revised plans. All features on Georgian Way are planned for a 2019 construction. A full rehabilitation of Glenbrook Boulevard will also be completed in 2019, including revision of the raised intersections. Once these construction projects are completed, the neighbourhood speed limit will be reduced to 40 km/h as planned in 2015. Permanent Driver feedback signs will also be installed on Galaxy Way in 2019 in place of the proposed physical traffic calming features.

Rehabilitation of Graham Road with crosswalk upgrades is planned for 2021.

4.0 Conclusion

This evaluation was undertaken with the purpose of ensuring the remaining traffic calming in Glen Allan is completed in a way that is economically viable, technically feasible and publically acceptable.

Resident evaluations of the features installed to date showed a range of satisfaction. Most notably, residents were very unhappy with the raised intersections on Glenbrook Boulevard. As a result, the raised intersections on Glenbrook Boulevard will be regraded as part of the road rehabilitation planned in 2019. Final implementation of the raised intersections will provide the traffic calming effect strongly desired by local residents while reducing driver frustration due to inconsistent construction.

Other traffic calming to date was generally more acceptable to residents, excepting curb extensions, which the majority of residents opposed. There is a significant portion of respondents, consistently about 25%-30%, who simply oppose the addition of traffic calming in any form.

With approximately half of the traffic calming plans in Glen Allan implemented to date, traffic data collection generally shows reduced speeds traffic at locations in Glen Allan still awaiting the addition of features. This has allowed engineers to put forward revised traffic calming plans that are more economical and less aggressive.

Overall, the revised traffic calming plans have resulted in a net savings of \$835,000 on the cost of the implementation at remaining locations. This represents a decreased budget of more than 60%, despite the addition of the features at the intersection of Georgian Way and Granada Boulevard.

Appendix One: Traffic Calming Options

Georgian Way (Glenbrook Boulevard to Gatewood Boulevard) Options

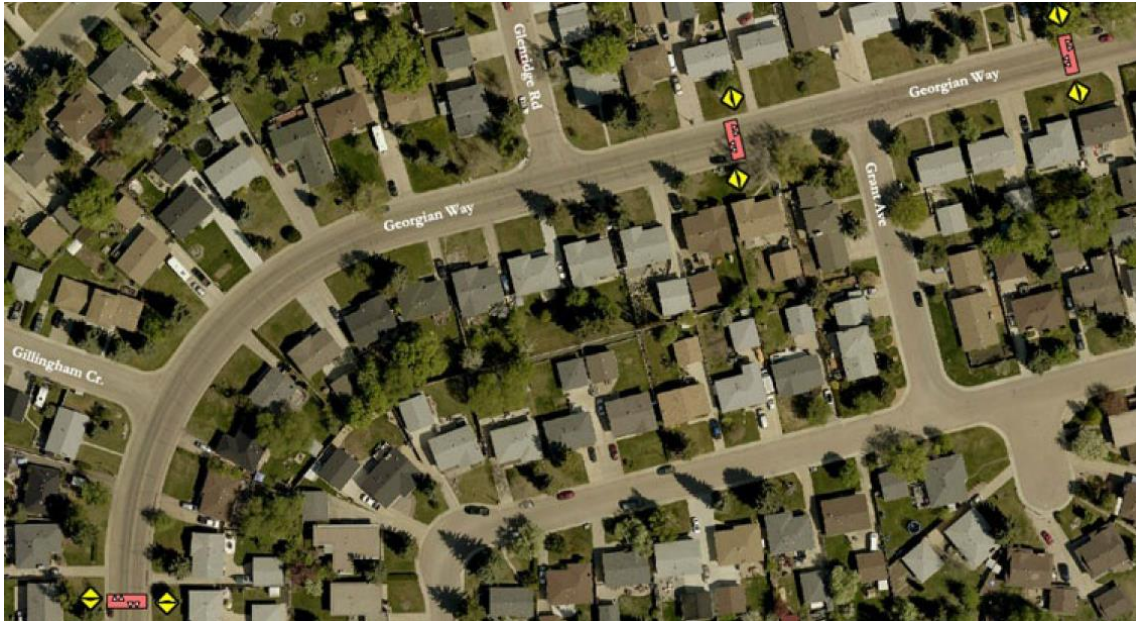
Option A: (Previously Approved Option) Raised Intersection/Curb Extensions (Estimated Cost \$165,000)



Option B: Curb Extensions/Speed Humps (Estimated Cost \$150,000)



Option C: Speed Humps Only (Estimated Cost \$30,000)



Georgian Way (Gatewood Boulevard to Granada Boulevard) Options

Previously Approved Option: Raised Intersections/Curb Extensions/Multi-use Path (Estimated Cost \$525,000). Due to unforeseen underground infrastructure needs, the updated cost estimate to construct the approved plan is approximately \$1.3 Million. Implementation at this cost is not budgeted. Thus this plan was not presented as an option in the 2018 resident engagement.



Option A: Multiple Curb Extensions / Multi-use Path/ Speed Humps (Estimated Cost \$480,000)

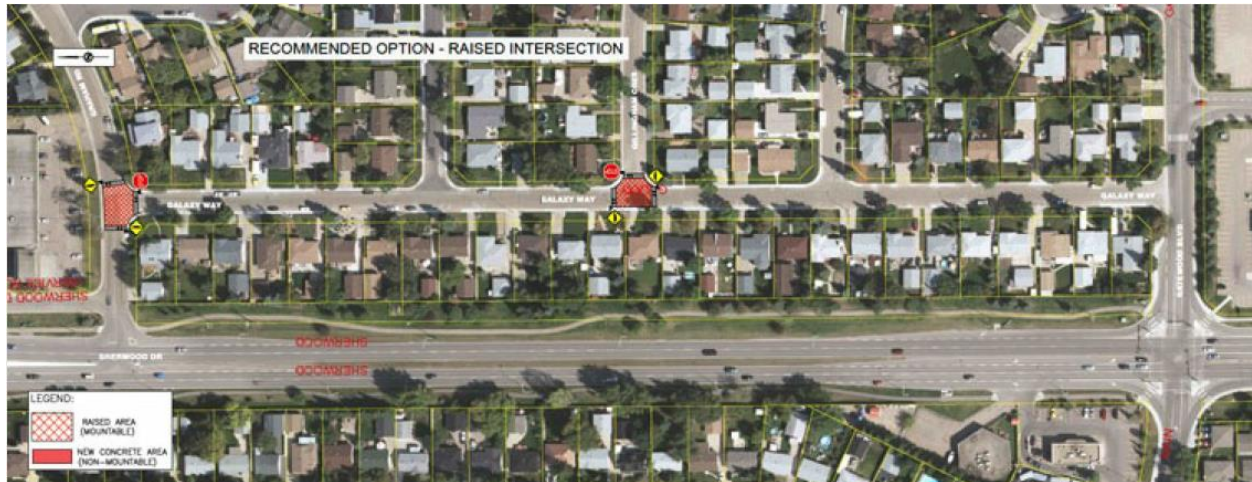


Option B: Curb extensions at Crosswalk Only/ Multi-use Path/ Speed Humps (Estimated Cost: \$280,000)



Galaxy Way Options

Option A: (Previously Approved Option) Raised Intersection (Estimated Cost: \$45,000)

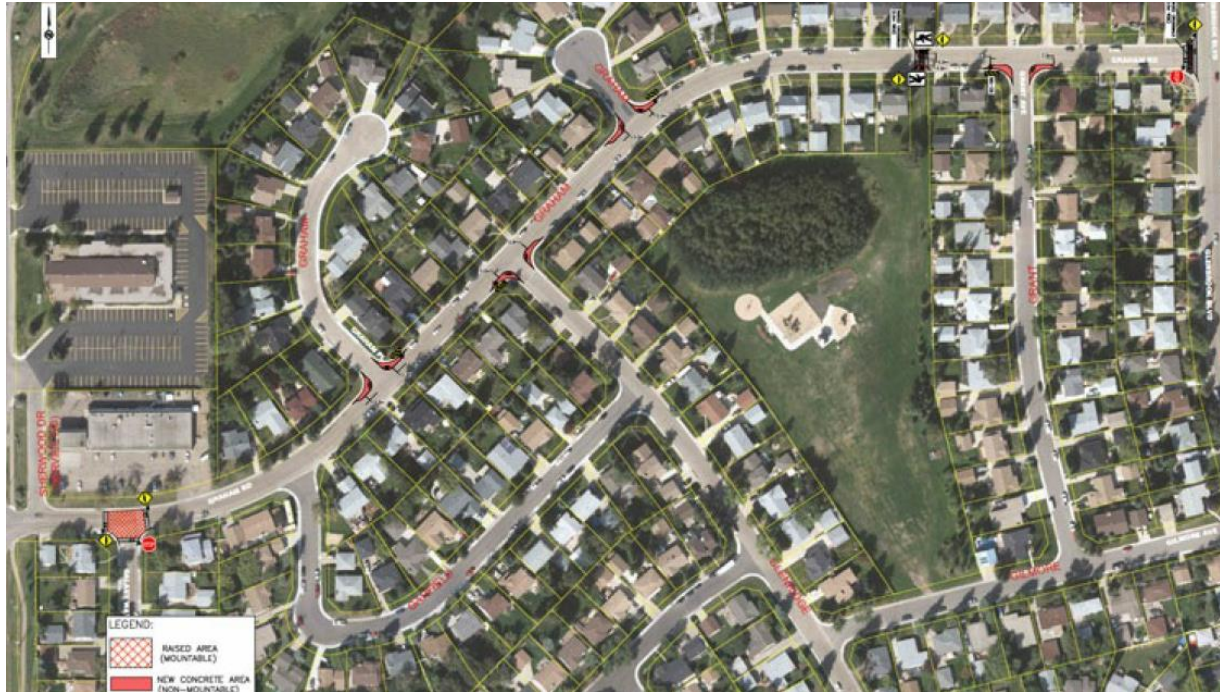


Option B: Speed Humps (Estimated Cost: \$30,000)



Graham Road Options

Option A: (Previously Approved Option): Raised Intersection/Curb Extensions/Raised Crosswalk
(Estimated Cost: \$235,000)



Option B: Curb extensions/raised crosswalk/speed humps (Estimated Cost: \$210,000)



Option C: Raised crosswalk/speed humps/curb extensions at crosswalk and major intersection
(Estimated Cost: \$80,000)

