

Councillor D. Kirton - Collision History on Circle Drive Between College Drive and Attridge Drive

ISSUE

This report presents the review of collision data and options to prevent median crossover collisions on Circle Drive between College Drive and Attridge Drive.

BACKGROUND

History

In 2016, an engineering consultant completed the In-Service Safety Review of Roadside Safety Systems on safety systems infrastructure associated with the City's high-speed roadways. All existing elements of safety systems were examined along Circle Drive and Idylwyld Drive including crash cushions, roadside barriers, median barriers, poles, piers, overhead guide signs, and guardrails on low-speed roads which may be associated with bridge piers and embankments. Elements of the safety systems along Circle Drive and Idylwyld Drive have been in place since the 1960s, and safety standards and protection systems have evolved considerably over that time, thus triggering the review.

At that time, the review indicated that a continuous median barrier on Circle Drive between College Drive and Attridge Drive was not warranted but it was noted that this location should be monitored and reassessed if there are increases in traffic volumes and/or cross-median collisions.

The engineering consultant's report noted the following:

“The result of the TAC/AASHTO and Caltrans warrant application appears to indicate that median barrier is not warranted at Location 1: Circle Drive: College Drive - Attridge Drive/Preston Avenue or location 2: Circle Drive: 33rd Street West – Laurier Drive. However, both warrants suggest these locations should be monitored and reassessed if there are increases in ADT and/or cross-median collisions.”

For clarity, TAC is an acronym for the Transportation Association of Canada, while AASHTO is short for American Association of State Highway and Transportation Officials, and Caltrans is the California Department of Transportation.

In 2019, an engineering consultant completed another review in consideration of cross-median collision occurrences in 2016 and 2017. They determined that only the major hazards within the median (e.g., bridge piers, overhead sign structures) required protection. These barriers were installed in the summer of 2021.

City Council, at its Regular Business Meeting held on February 22, 2021, considered a notice of motion put forward by Councillor Kirton, and resolved:

“That Administration be directed to report on the collision history on Circle Drive between College Drive and Attridge Drive, and include options, and the feasibility of each option, to prevent median crossover head on collisions on this section of roadway.”

Current Status

Collision History on Circle Drive between College Drive and Attridge Drive

The College Drive interchange opened in 2008 and was the last major change to infrastructure in this segment of roadway. The last update of collision data from Saskatchewan Government Insurance (SGI) does not include 2021. The table below includes the total number of collisions with the number of cross-median collisions indicated in brackets.

Year	Number of Total Collisions (Number of Cross-Median Collisions)				Total
	Fatal	Severe Injury	Minor Injury	Property Damage Only	
2008	0	0	5	12	17
2009	0	0	0	33	33
2010	0	0	2	12	14
2011	0	0	7	11	18
2012	0	0	7	20	27
2013	0	1 (1)	6 (1)	36	43 (2)
2014	0	0	3	15	18
2015	0	0	1	9	10
2016	1 (1)	0	2 (1)	10	13 (2)
2017	1 (1)	0	2	14	17 (1)
2018	0	0	1	10	11
2019	0	0	2	7	9
2020	1	0	1	9	11
Total	3 (2)	1 (1)	39 (2)	198	241 (5)

In January 2021, another fatal cross-median collision occurred.

City of Saskatoon’s Current Approach

The general primary source of design guidance are the median barrier guidelines that have been established by TAC in the Geometric Design Guide for Canadian Roads (GDG) and by AASHTO in the Roadside Design Guide. The median barrier guidelines are summarized in Appendix 1.

TAC has noted a trend of ‘relaxing’ the criteria that triggers the recommendation of a median barrier, resulting in barrier installation that otherwise would not meet the strict warrant criteria verbatim. Some examples include:

- Caltrans considers installation of barriers on medians as wide as 23 metres, depending on traffic volumes.
- North Carolina freeways having median widths of 21 metres or less require median barrier regardless of Average Annual Daily Traffic (AADT).

This is notable as primary inputs into the warrants include median width and traffic

volumes. The states of California and North Carolina are in essence 'relaxing' the criteria for requiring median barrier and installing this type of infrastructure.

There are other factors to consider when considering median barriers:

- Depending on the type of barrier, rigid or flexible, the collision rate for one type of collision may be reduced while increasing another. For example, if a concrete median (rigid) barrier is installed where no barrier existed prior, there is a high likelihood that the total number of collisions will increase on that segment of freeway, as instead of drivers off-roading, re-gaining control, and safely re-entering their driving lane, they will now potentially collide with a concrete barrier. This vehicle also incurs risk of being rear-ended or side-swiped by a following vehicle. Conversely, it is expected that the number of cross-median head-on collisions would be significantly reduced with the introduction of a median barrier. This is important as the severity of a cross-median head-on collision is greater than a single vehicle side-swiping a concrete barrier, or one vehicle rear-ending or side-swiping another.
- Considerations of the cable type (flexible) of median barrier focus on maintenance efforts. For example, careful design is required to address:
 - minimizing injuries to motorcycle drivers if they strike a barrier;
 - repair operations after the barrier is struck by a vehicle;
 - winter maintenance such as snow removal; and,
 - summer maintenance such as grass cutting.

Finally, due to the specialized nature of roadside safety infrastructure, most often engineering services are provided to the Administration by consultants that specialize in the review and design of the various types of infrastructure. For example, the Administration used engineering consultants with expertise on roadside barriers on the 2016 and 2019 reviews, and the 2020 detailed design of the roadside safety improvements that were installed in 2021.

OPTIONS

Option 1 – Status Quo

This option would result in a median barrier not being installed, the collision history and traffic volumes being monitored, and the segment of Circle Drive being reviewed again in the future.

Advantages:

- Potential funding could be spent on another priority project.

Disadvantages:

- Does not prevent cross-median collisions.

Option 2 – Develop a Policy/Guideline

This option would explore developing a policy or guideline for median barriers on Saskatoon's freeways and expressways. The Administration is not certain a formulaic

policy is feasible given the unique conditions that each segment of freeways may have in terms of median width, traffic volumes, and collision types. There are also other engineering solutions that may be more practical and effective in improving safety such as road realignment, and strategic or variable speed limits. An engineering consultant with expertise in roadside barriers could be retained to research and develop a policy or guideline.

Advantages:

- If feasible, may provide a straight-forward approach to determining the requirement for median barriers, and which type.
- At a minimum, the research and policy/guideline would provide additional background information on median barriers for future use.

Disadvantages:

- No funding is currently available to begin this work.
- The time to complete the work would further delay potentially installing median barriers, thus not preventing cross-median collisions.

Option 3 – Direct the Administration to Add the Design and Construction of a Median Barrier Between College Drive and Attridge Drive to the Annual Business Plan and Budget Process for Prioritization, and to Develop a Policy/Guideline.

This option would direct Administration to add the design and construction of a median barrier on Circle Drive between College Drive and Attridge Drive to the Annual Business Plan and Budget Process for prioritization, and develop a policy/guideline for median barriers. The type of median barrier would require further investigation as part of a detailed design contract. This option would include all the components described in Option 2.

Advantages:

- Cross-median barrier would be installed when the funding is approved, thus preventing cross-median collisions.
- Advantages from Option 2.

Disadvantages:

- AASHTO identifies the following disadvantages with the increased use of median barriers:
 - The initial costs of installing a barrier can be significant.
 - The installation of a barrier will generally increase the number of reported crashes as it reduces the recovery area available. As a result, there could be increased maintenance costs to repair the barrier as well as increased exposure to the maintenance crews completing the repairs.
 - It will limit the options of maintenance and the repairs.
 - It will limit the options of maintenance and emergency service vehicles to cross the median.

- Since the recovery area available for off-roading vehicles is reduced, the total number of collisions may increase even though overall severities would be expected to decrease.
- Maintenance: Space for crews completing repairs, snow removal, and grass cutting.
- Increased maintenance costs to repair barrier.
- No funding is currently available to begin this work, or available to operate the infrastructure.

RECOMMENDATION

That the Standing Policy Committee on Transportation recommend to City Council:

1. That the detailed design of a median barrier on Circle Drive between College Drive and Attridge Drive be added as a project to the Transportation Infrastructure List for future prioritization (Option 3);
2. That the installation of a median barrier on Circle Drive between College Drive and Attridge Drive be added as a project to the Transportation Infrastructure List for future prioritization (Option 3); and
3. That a policy or guideline be developed for retrofitting median barriers on high-speed roadways (expressways and freeways) (Option 3).

RATIONALE

The following was considered in developing the recommendations:

- The 2016 engineering review recommended monitoring collisions and traffic volumes, as the TAC and AASHTO warrants did not, at that time, suggest a median barrier.
- The 2019 engineering review recommended reinforcing the road-side safety infrastructure at bridge piers and overhead sign structure.
- The segment of Circle Drive has had three cross-median fatalities occur over the past six years, including one after the 2019 engineering review.

Other jurisdictions are 'relaxing' the criteria for consideration of the installation of a median barrier.

The type of median barrier will be determined through the detailed design process. Once the median barrier type is determined, a detailed cost estimate can be developed for capital budgeting purposes for the installation of the physical infrastructure. Thus the reasoning for separating this initiative into two projects, design and cost estimate, and then installation.

As with all transportation projects, including traffic safety projects, this project will be evaluated and prioritized alongside all other transportation projects. The Transportation Prioritization List is scheduled to complete the prioritization exercise and subsequent reporting to the Standing Policy Committee on Transportation at the end of 2022. The

updated Transportation Prioritization List will then be considered during City Council's Annual Business Plan and Budget Process.

FINANCIAL IMPLICATIONS

The Administration will include the funding request for these recommendations in a future multi-year business plan and budget submission package listing the projects to be funded, and the rationale used to prioritize the projects. The Administration will also include the policy or guideline development and detailed design project on the RCE list for consideration in the 2023 budget process. Alternate sources of funding identified for road safety initiatives will be considered if they become available.

ADDITIONAL IMPLICATIONS/CONSIDERATIONS

There are no privacy, legal, social, or environmental implications identified.

COMMUNICATION ACTIVITIES

A median barrier system will have impacts on maintenance and emergency services. These impacts will be discussed with internal stakeholders at the appropriate time.

APPENDICES

1. Median Barrier Guidelines

Report Approval

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