

Sarcee Trail Scenarios

Several scenarios and combinations of infrastructure improvements were investigated as part of the Sarcee Trail analysis. In each case, the conditions with and without the West Ring Road in place were evaluated. Figure 1 illustrates the 5 potential improvements which were reviewed.

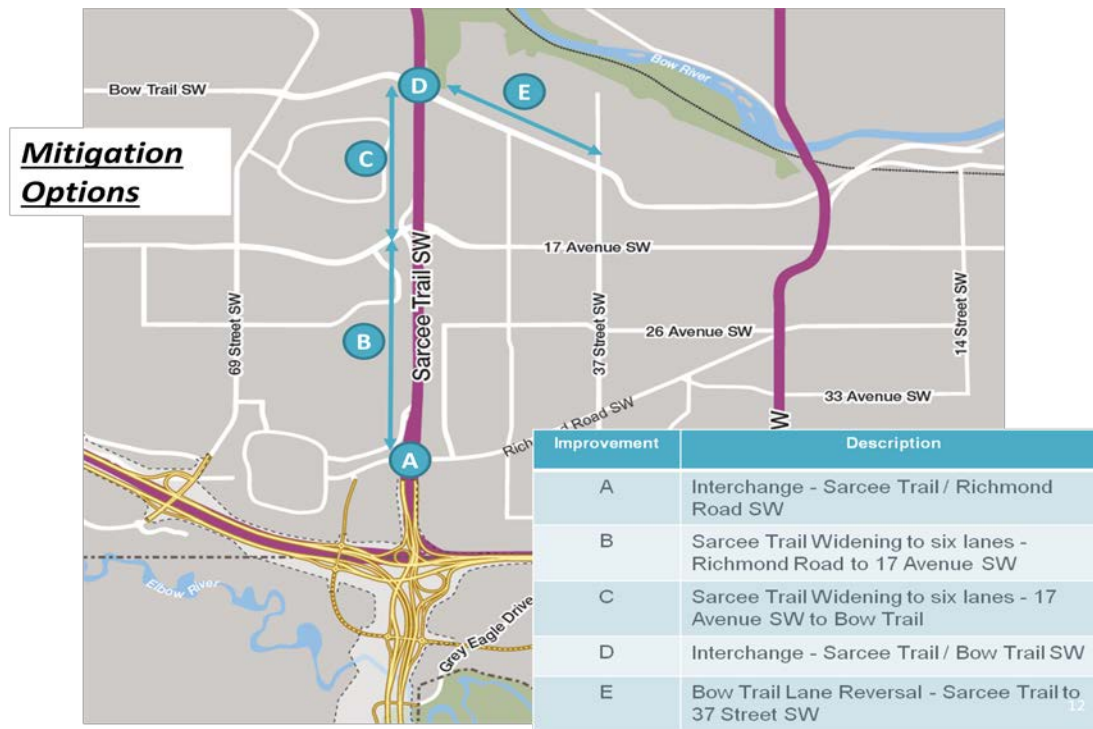


Figure 1 Potential Improvements for Sarcee Trail

Based on the analysis completed, Sarcee Trail observes a 10-25% increase in traffic volumes once the SW Ring Road is completed, and without the West Ring Road in place. This will result in increased congestion and delay along Sarcee Trail including both Richmond Road and Bow Trail, as Sarcee Trail serves as a substitute route for both local and regional travelers who would otherwise use the West Ring Road to travel along the west side of Calgary.

Table 1 describes 10 combinations of measures which were evaluated as part of this analysis, and the benefits to Richmond Road (traffic volumes and congestion), Sarcee Trail (congestion and travel delay), and Crowchild Trail (traffic volumes) for each scenario both with and without the West Ring Road in place.

Sarcee Trail Scenarios and Analysis

Table 1 Sarcee Trail Scenarios

Options: A = Interchange at Richmond Rd B = Sarcee Tr widening Richmond Rd to 17 Ave C = Sarcee Tr widening Richmond Rd to Bow Tr D = Interchange at Bow Tr E = Lane reversal on Bow Tr from Sarcee Tr to 37 St						Cost (high level estimate)	Benefit to Richmond Road		Benefit to Sarcee Trail		Benefit to Crowchild Trail	
							With the West RR	Without West RR	With the West RR	Without West RR	With the West RR	Without West RR
1	A	B	C	D		\$250M						
2		B	C	D		\$170M						
3	A	B	C		E	\$130M						
4	A	B	C			\$120M						
5	A				E	\$70-80M						
6	A					\$60-70M						
7		B	C		E	\$70M						
8		B	C			\$60M						
9		B				\$30M						
10					E	\$10M						

Options 1, 3 and 5 in Table 1 were chosen to evaluate further due to their effectiveness in either the short term, long term, or both, as shown in the results in Table 1.

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Option 1: Includes a full Sarcee Trail upgrade (interchanges at Bow Trail and Richmond Road, widening between Richmond Road and Bow Trail) has a high impact but comes at a high cost. It provides greater short term benefit along Sarcee Trail than other mitigation options, but less benefit to Richmond Road area than other mitigation options.

Option 3: Includes an interchange at Richmond Road, widening of Sarcee Trail between Richmond Road and Bow Trail, and lane reversal on Bow Trail, and provides some benefit to Sarcee Trail performance, particularly in the short term. Richmond Road carries traffic volumes which are close to the volumes observed prior to the SW Ring Road opening. A shift in traffic to Bow Trail is observed with the increased capacity created by the lane reversal for the morning rush hour. Constraints remain at the intersection of Bow Trail & Sarcee Trail, and there is no change to traffic patterns at Crowchild Trail & Glenmore Trail.

Option 5: Includes an interchange at Richmond Road and lane reversal on Bow Trail, provides the same benefit as Option 3, though less benefit is seen for Sarcee Trail as no widening is included.

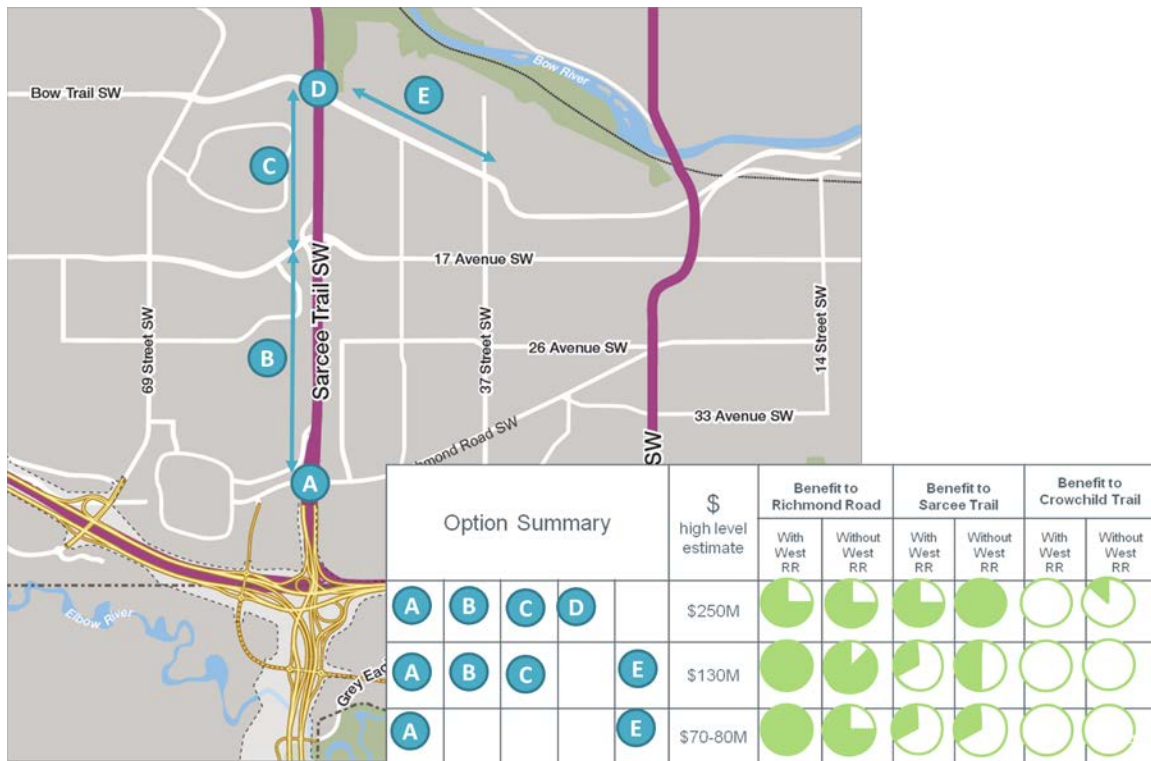


Figure 2 Sarcee Trail Options 1, 3, and 5

Cost Benefit Analysis

A Cost Benefit Analysis was completed on the top three potential mitigation options which evaluated construction cost, anticipated additional maintenance and operation costs, travel time savings with each potential group of improvements (as compared to a base case, with no improvements to Sarcee Trail), social and safety benefits, and environmental cost/benefit. The results of this analysis are shown in Table 2.

It can be seen from this analysis that a full upgrade to Sarcee Trail provides significant travel time benefits, and this is most evident in the scenario without the West Ring Road. The analysis reveals less benefit once the West Ring Road is in place.

The costs of the different options range from approximately \$75M for Option 5 to \$250M for Option 1. Option 1 carries a capital cost of approximately 3.5 times the cost of Option 5, but in the long term (i.e. with the West Ring Road in place) offers approximately 2 times the yearly travel time savings, carries a higher operating and maintenance cost, and provides approximately 2 times the greenhouse gas emission reduction. In other words, the long term benefits are relatively more significant for Option 5 than Option 1.

However, if the West Ring Road were to be delayed indefinitely, the travel time savings of Option 1, carried over a longer term, demonstrate a clear benefit for improvements to the entire Sarcee Trail corridor.

Table 2 Cost Benefit Analysis of Sarcee Trail Scenarios

Potential Improvements	Costs/Benefits		
		With West Ring Road	Without West Ring Road
Option 1 <ul style="list-style-type: none"> Widen Sarcee Trail to 6 lanes Construct interchange at Richmond Road / Sarcee Trail Construct interchange at Bow Trail / Sarcee Trail 	Construction Cost	\$250M	\$250M
	Operations and Maintenance Cost	\$25-30k/year	\$25-30k/year
	Travel Time Savings along Sarcee Trail – AM peak	\$630k/year	\$1.25M/year
	Travel Time Savings along Sarcee Trail – PM peak	\$700k/year	\$1M/year
	Social/Safety	<ul style="list-style-type: none"> Reduced traffic volumes on Richmond Road and reduced potential for community traffic issues Alleviates potential issues with maintaining effective and safe operation of Sarcee Trail / Richmond Road as an at-grade intersection due to the proximity to the Glenmore Trail / Sarcee Trail interchange. 	

Sarcee Trail Scenarios and Analysis

Potential Improvements	Costs/Benefits		
	Environmental	17% reduction in greenhouse gas emissions along Sarcee Trail corridor (in part due to decreased traffic volumes)	0.26% increase in greenhouse gas emissions along Sarcee Trail corridor (in part due to increased traffic volumes)
Option 3 <ul style="list-style-type: none"> Widen Sarcee Trail to 6 lanes between Richmond Road and Bow Trail Construct interchange at Richmond Road / Sarcee Trail Implement lane reversal on Bow Trail between Sarcee Trail and 37 Street SW 	Construction Cost	\$130M	\$130M
	Operations and Maintenance Cost	\$20-25k/year	\$20-25k/year
	Travel Time Savings along Sarcee Trail – AM peak	\$525k/year	\$660k/year
	Travel Time Savings along Sarcee Trail – PM peak	\$560k/year	\$650k/year
	Social/Safety	<ul style="list-style-type: none"> Reduced traffic volumes on Richmond Road and reduced potential for community traffic issues Alleviates potential issues with maintaining effective and safe operation of Sarcee Trail / Richmond Road as an at-grade intersection due to the proximity to the Glenmore Trail / Sarcee Trail interchange. 	
	Environmental	~10% reduction in greenhouse gas emissions along Sarcee Trail corridor	~4% reduction in greenhouse gas emissions along Sarcee Trail corridor
Option 5 <ul style="list-style-type: none"> Construct interchange at Richmond Road / Sarcee Trail Implement lane reversal on Bow Trail between Sarcee Trail and 37 Street SW 	Construction Cost	\$75M	\$75M
	Operations and Maintenance Cost	\$10k/year	\$10k/year
	Travel Time Savings along Sarcee Trail – AM peak	\$360k/year	\$626k/year
	Travel Time Savings along Sarcee Trail – PM peak	\$370k/year	\$675k/year
	Social/Safety	<ul style="list-style-type: none"> Reduced traffic volumes on Richmond Road and reduced potential for community traffic issues Alleviates potential issues with maintaining effective and safe operation of Sarcee Trail / Richmond 	

Sarcee Trail Scenarios and Analysis

Potential Improvements	Costs/Benefits		
		Road as an at-grade intersection due to the proximity to the Glenmore Trail / Sarcee Trail interchange.	
	Environmental	8% reduction in greenhouse gas emissions along Sarcee Trail corridor	6% reduction in greenhouse gas emissions along Sarcee Trail corridor

Summary

Option 1 provides a clear benefit to the Sarcee Trail corridor prior to West Ring Road completion in terms of travel time savings and also in terms of congestion relief as traffic volumes are expected to increase without the West Ring Road in place. However, in the longer term, traffic volumes are anticipated to decrease on Sarcee Trail, and while travel time savings are still observed, the overall need for improvements in order to alleviate congestion is significantly reduced.

Option 3 (interchange at Richmond Road, Sarcee Trail widening between Richmond Road and Bow Trail, and lane reversal on Bow Trail between Sarcee Trail and 37 Street SW) represents a scenario which provides benefit to the Sarcee Trail corridor, but the cost of the widening is relatively high when compared to the relative benefit of the investment, particularly in the shorter term, as shown in Table 2. However, this option provides the most consistent travel time savings whether the West Ring Road is in place or not.

Option 5 (interchange at Richmond Road, lane reversal on Bow Trail between Sarcee Trail and 37 Street) provides the most significant benefit to Richmond Road of the three scenarios evaluated in detail relative to the capital cost of the infrastructure, with an overall benefit in both the short and long term (before and after completion of the West Ring Road) and an estimated capital cost that is approximately 3.5 times less than Option 1.