

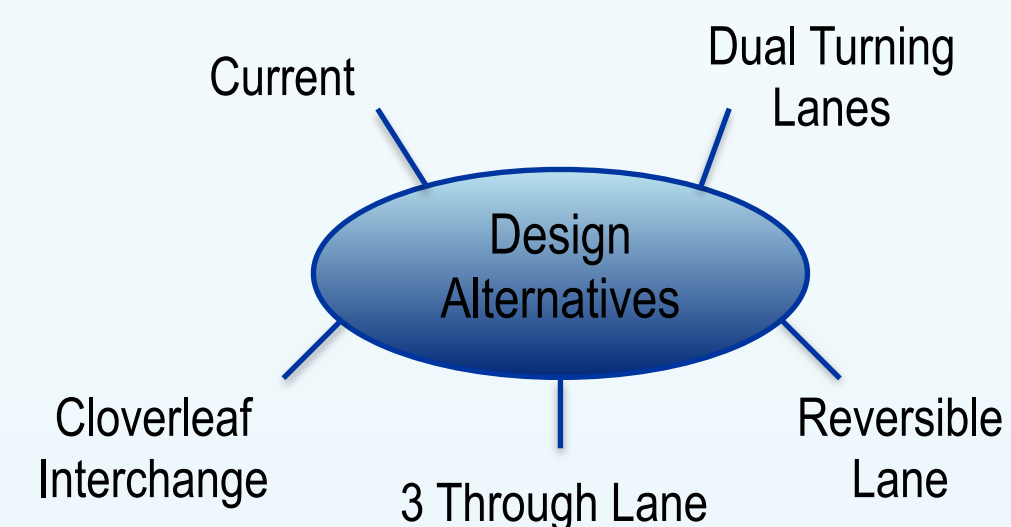
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## Purpose

### Evaluate Current Conditions of Arcola Avenue Overpass

- The two intersections experience a Level of Service (LOS) F and a vehicle/capacity (v/c) ratio exceeding 1 during peak hours.
- The city experiences an average annual population increase of 2%, suggesting congestion on the overpass will only become greater.

### Propose 5 Design Alternatives



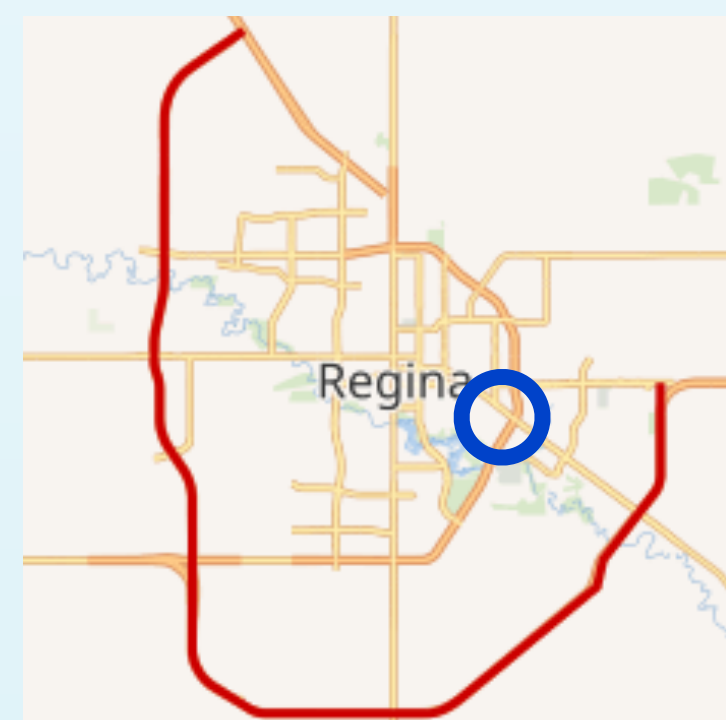
### Identify Best (Primary) Alternative

- Using Synchro Software, a traffic signal timing software, data for each alternative is collected and evaluated. The Primary (Recommended) Alternative is determined using a weighted decision matrix.

### Conduct In-Depth Analysis on Primary Alternative

- The in-depth analysis includes details on signalling, alignment, drainage, associated costs, benefits, impacts, and an AutoCAD drawing.

## Project Profile



The blue circle in figure 1 highlights the overpass and its intersections. The map of Regina outlines the major roads in the city and points to Arcola Avenue as one of the few roads supporting east-west travel.

Figure 1: Project Scope

### ACKNOWLEDGEMENTS

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## Project Background

### Site Investigation

Level of Service (LOS)

Vehicle Capacity Ratio (v/c)

Intersection Signal Delay

Intersection Capacity Utilization

### Design Criteria

Design criteria (figure 2) used to evaluate and compare each alternative are assigned a weight based on the project's objectives and scope.

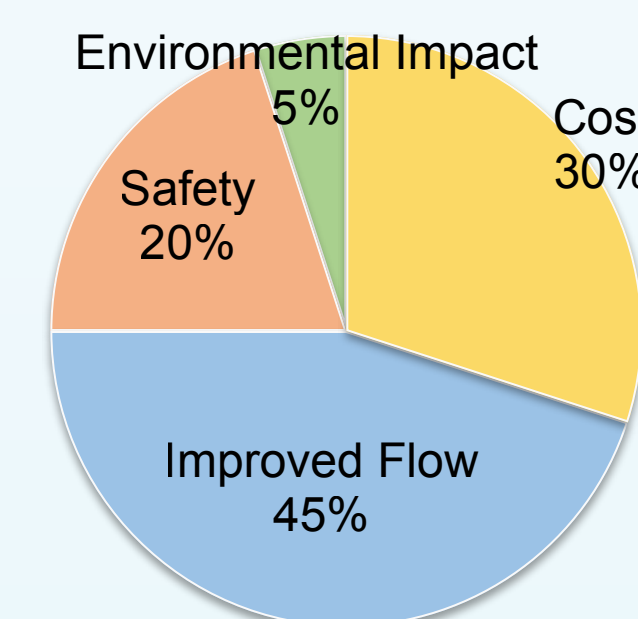


Figure 2: Design Criteria & Weight

### Evaluation

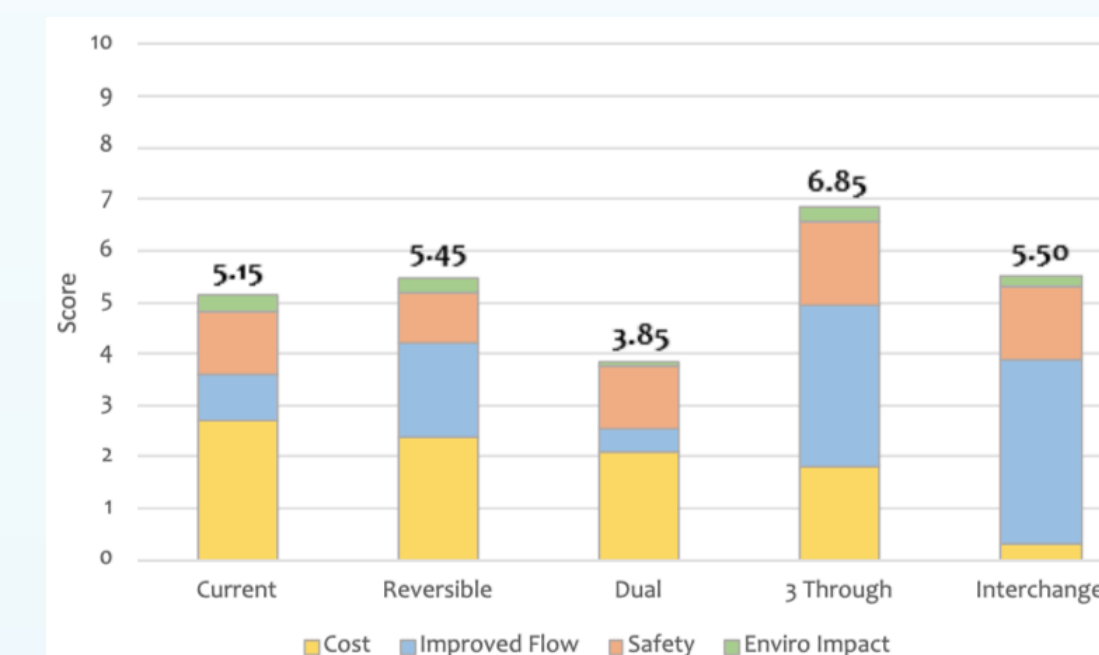


Figure 3: Design Alternative Scoring

Figure 3 provides the contribution of each design criteria and their weights for each proposed alternative. The alternative with the highest rating is the 3 Through Lane with a score of 6.85 out of 10.

## Current and Recommended Design

The 3 Through Lane alternative involves the construction of an additional lane on each side of the bridge. This implementation provides an additional through lane for both directions of travel, and increases the number of turning lanes from one to two.

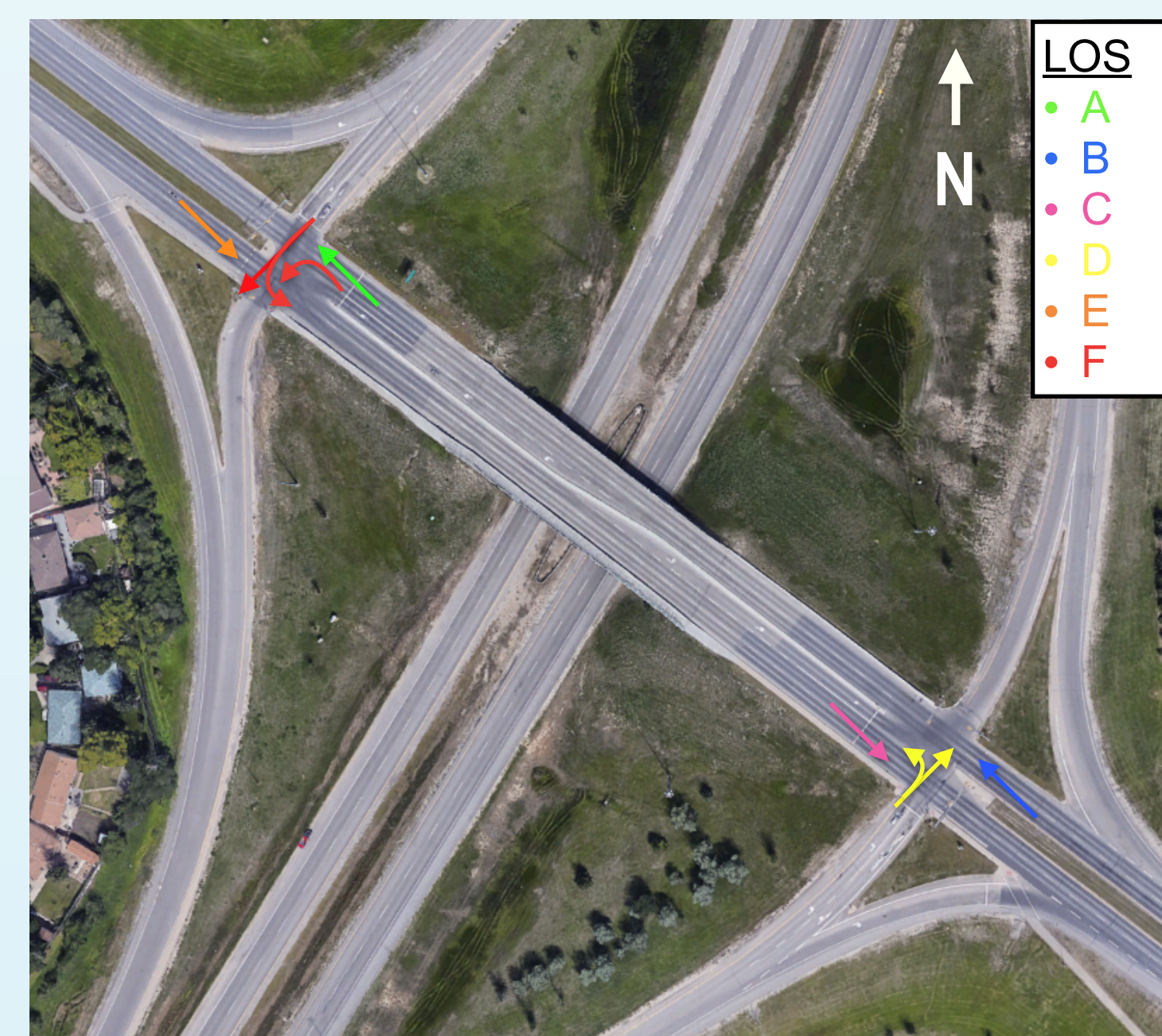


Figure 4a: Arcola Avenue Overpass (Current)

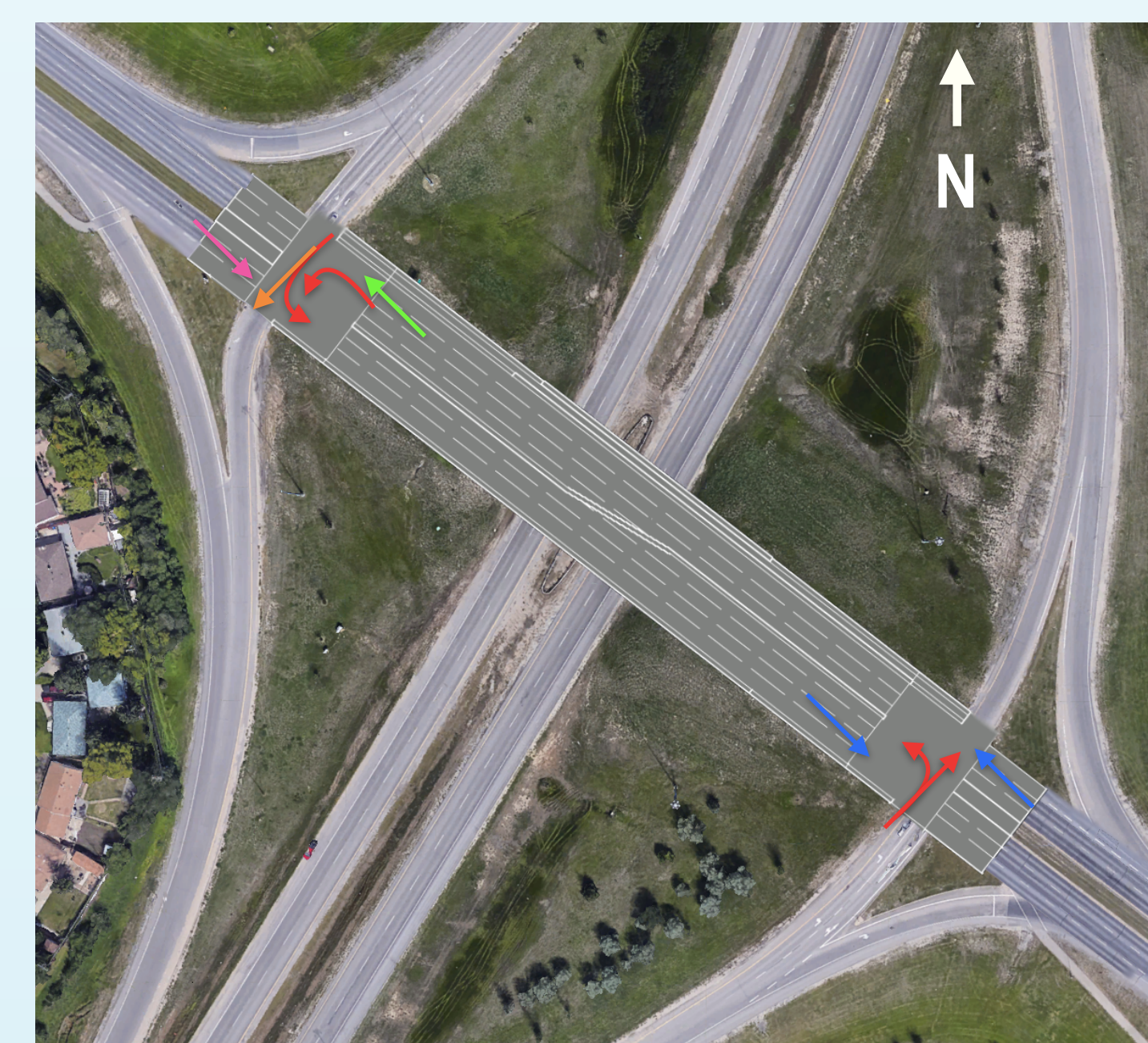


Figure 4b: Arcola Avenue Overpass (3 Through Lane)

## Design Alternative Summary

Table 1: Design Summary

	Cost	Improved Flow	Safety	Enviro Impact	Total Score	Rank
Current	9	2	6	7	5.15	4
Reversible	8	4	5	5	5.45	3
Dual	7	1	6	2	3.85	5
3 Through	6	7	8	6	6.85	1
Interchange	1	8	7	4	5.50	2

Each alternative is assigned a rating from 1 (undesirable or adverse) to 10 (desirable or positive) for each design criteria during evaluation. The rating is multiplied by the associated criteria weight, and summarized. A rank is assigned to each alternative based on their score out of 10.

## Recommended Design Summary

### Cost

- The estimated cost ranges between \$5-10 million dollars.

### Improved Flow

The intersection currently experiencing the most congestion is the west intersection during the PM peak hours. The following improvements are made to this intersection with implementation of the 3 through lane:

- 43.5% decrease in signal delay
- 10.33% decrease in intersection capacity utilization
- 10.28% decrease in maximum v/c ratio
- LOS improved from E to C

### Safety

- Improved lighting at pedestrian/bicycle crossings
- Addition of flashing pedestrian crossing lights
- Additional lane to either side improves traffic flow and decreases congestion
- Improved northwest bound left turn (onto southbound ramp) at west intersection

### Environmental Impact

- Redesign promotes active modes of transportation to decrease motor vehicles and therefore the amount of emissions being released into the atmosphere