Public Works Committee
June 5, 2017
Item 7.2

Queen Street South One-Way to Two-Way Conversion Feasibility Study

King Street to Aberdeen Avenue

June 5, 2017

Outline

- Background
- Study area and existing Conditions
- Two-Way Alternatives
- Analysis and Evaluation
- Study outcome

Background

On October 26, 2016, Council approved the following motion

“That staff be directed to undertake a feasibility study and prepare a functional design that would include one northbound lane, one southbound lane and one directional lane based on peak hours for the conversion of Queen Street South from one-way operation to two-way operation between Aberdeen Avenue and King Street West;

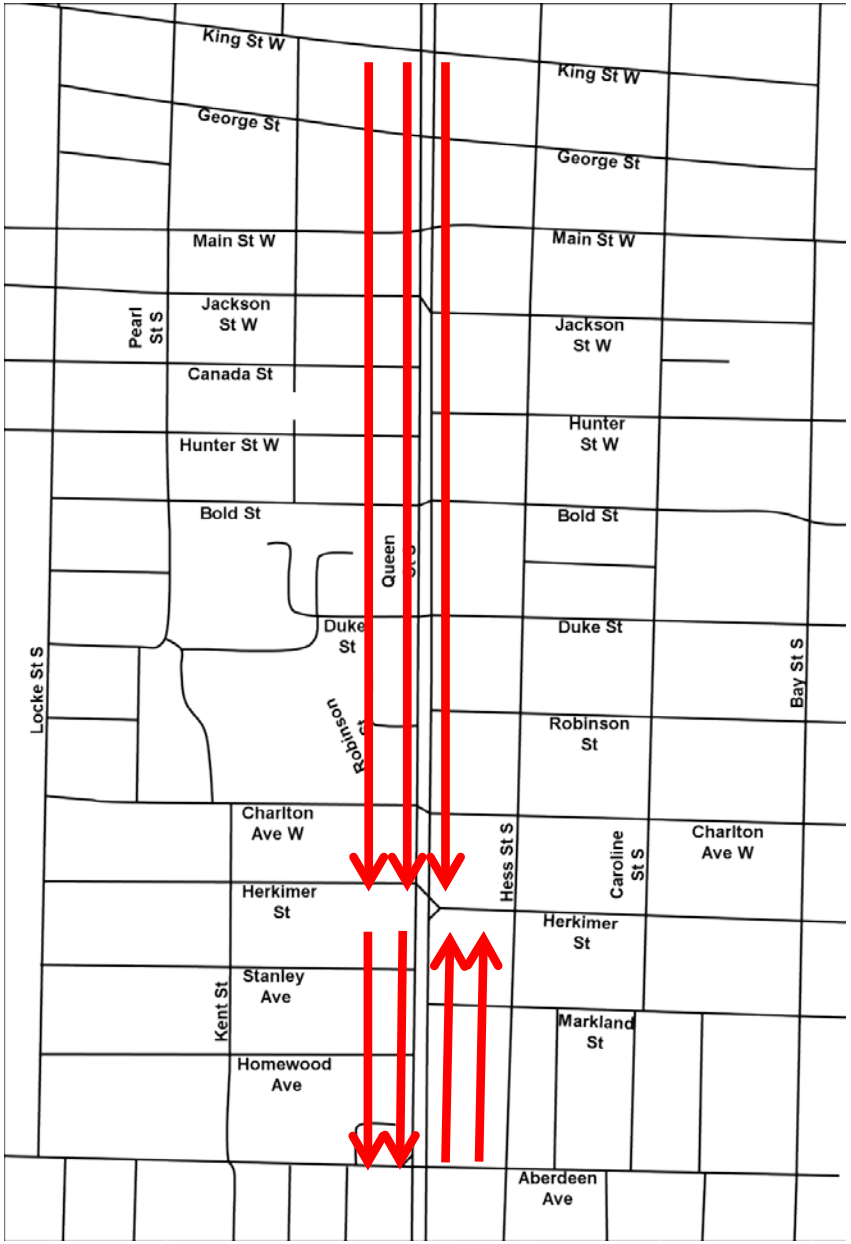
That the cost associated with the feasibility study and functional design be funded equally from the Wards 1, 2 & 8 Area Rating; and

That staff be directed to report back to the Public Works Committee in April 2017 with recommendations and funding requirements for the conversion of Queen Street South from one-way operation to two-way operation between Aberdeen Avenue and King Street West.”

Study Area

3 lanes Southbound
King to Herkimer
(950 m)

2 lanes Southbound
2 lanes Northbound
Herkimer to Aberdeen
(275 m)



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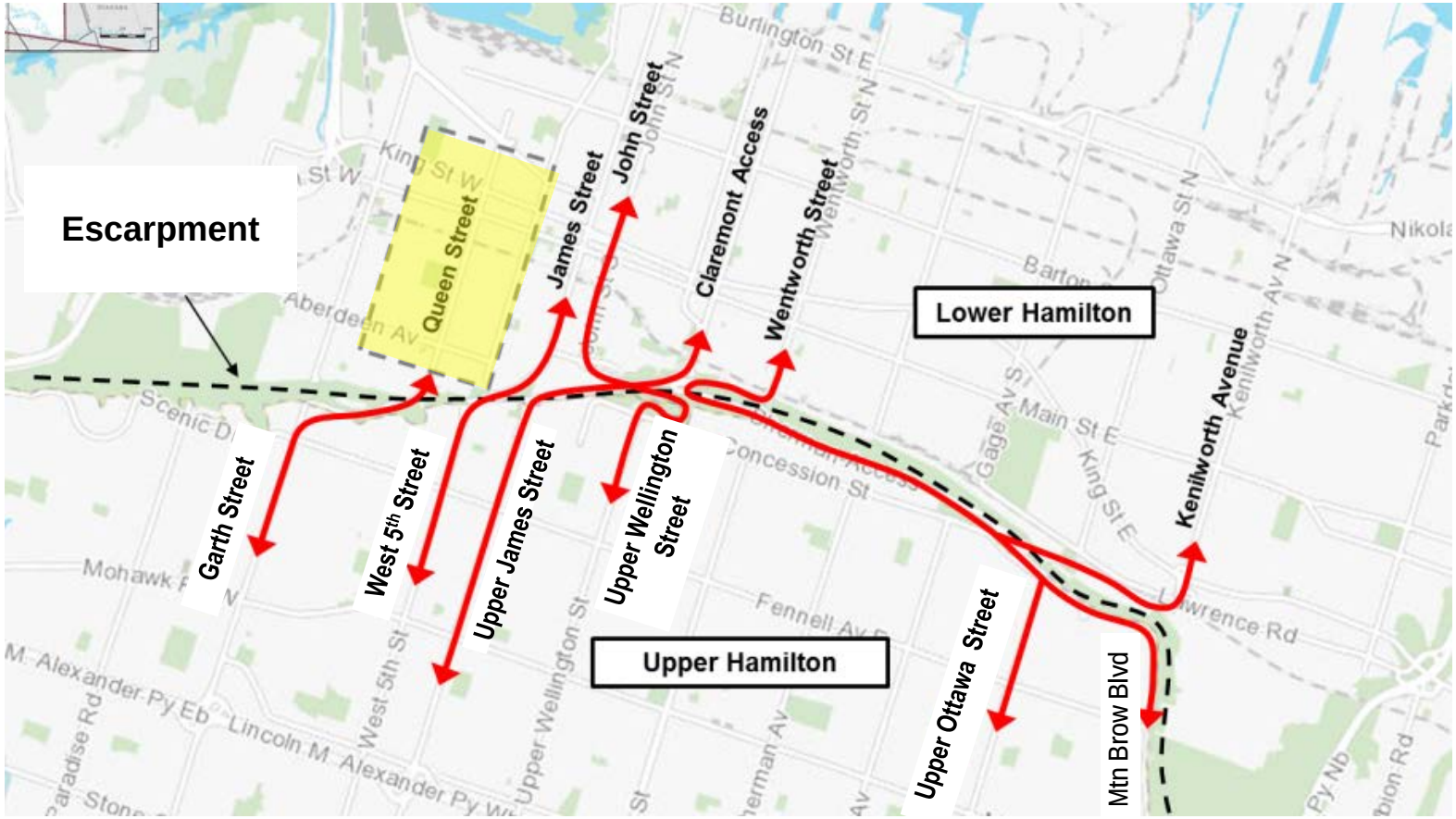
Escarpment Crossings in Central Hamilton



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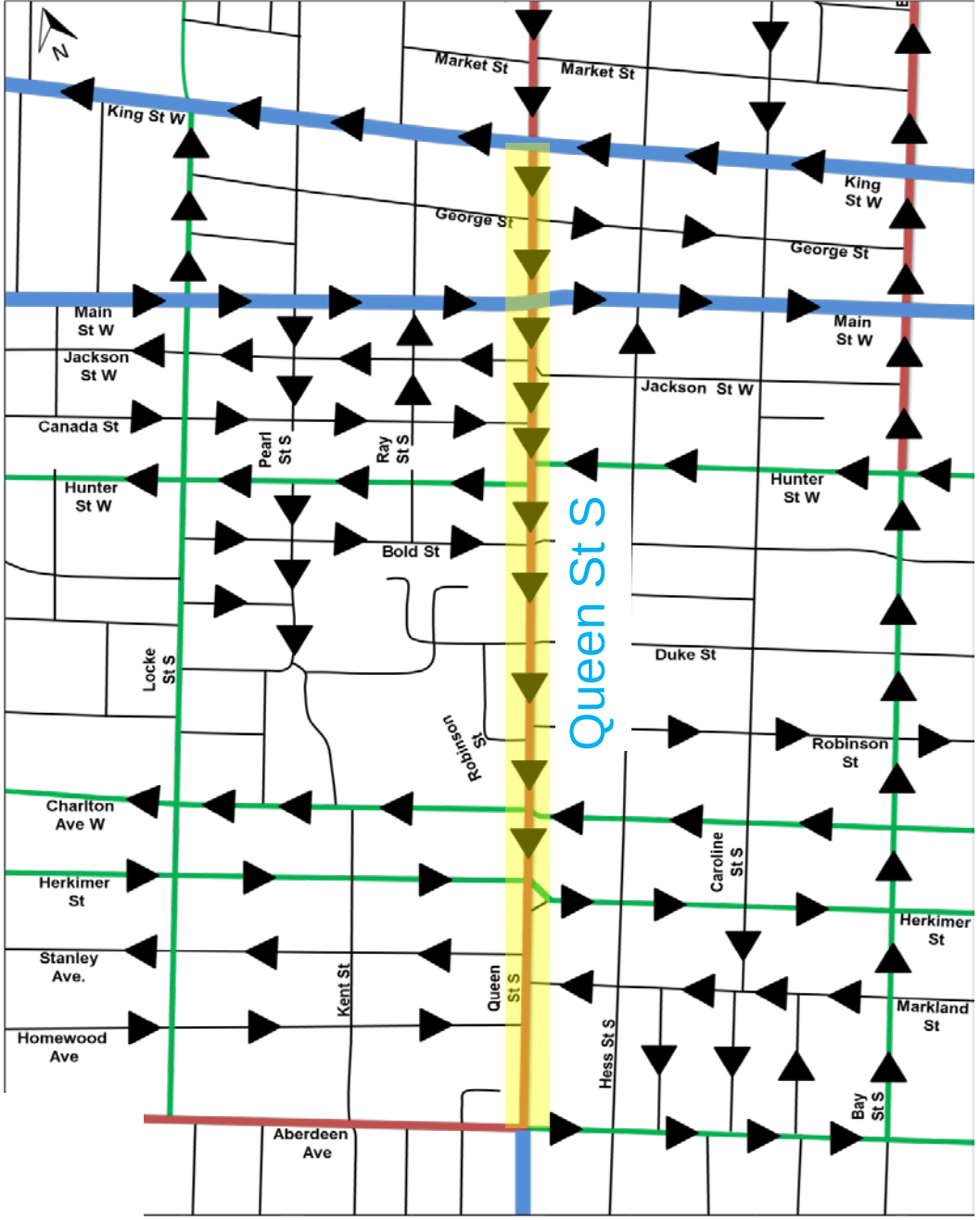
Queen Street in the One-Way Network

LEGEND

- Major Arterial
- Minor Arterial
- Collector
- Local



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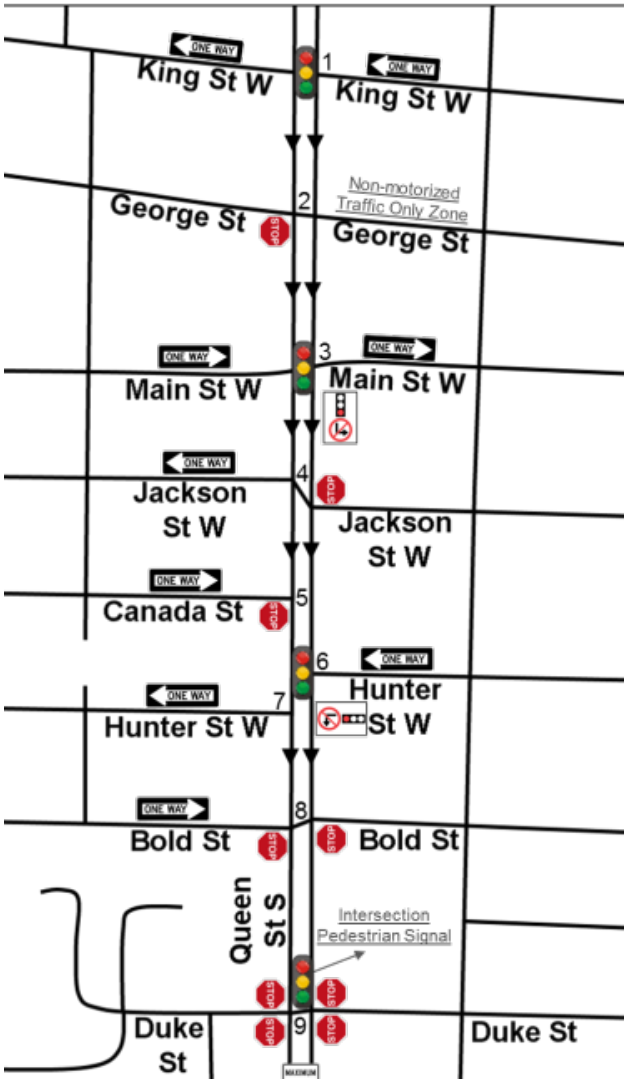
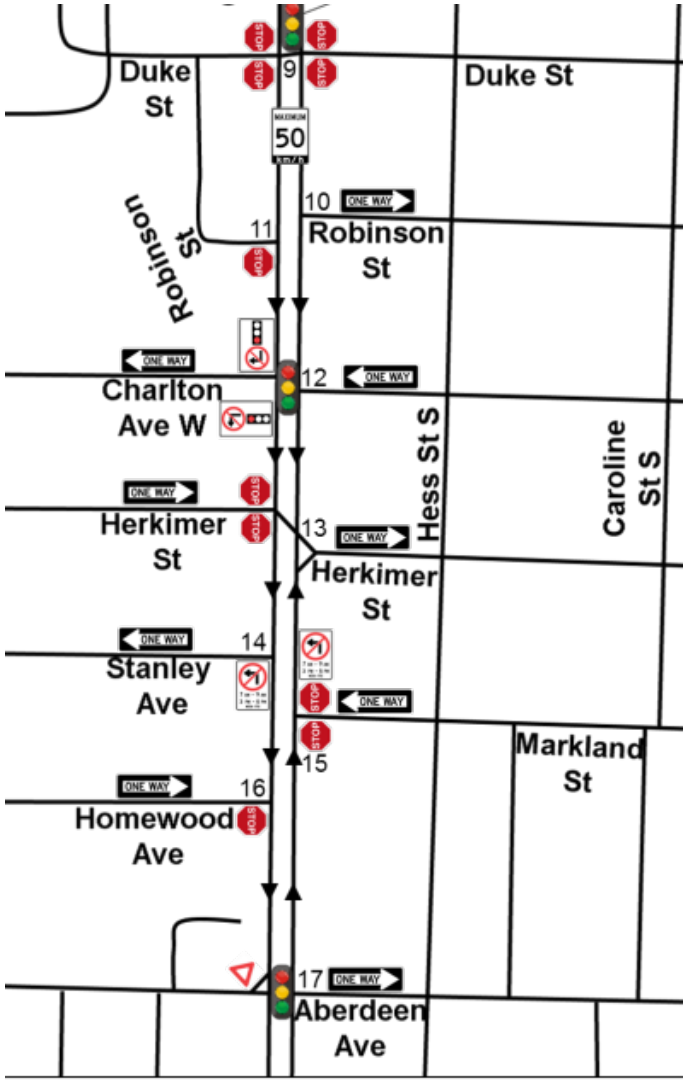
Traffic Control and Operation



North Half



South Half

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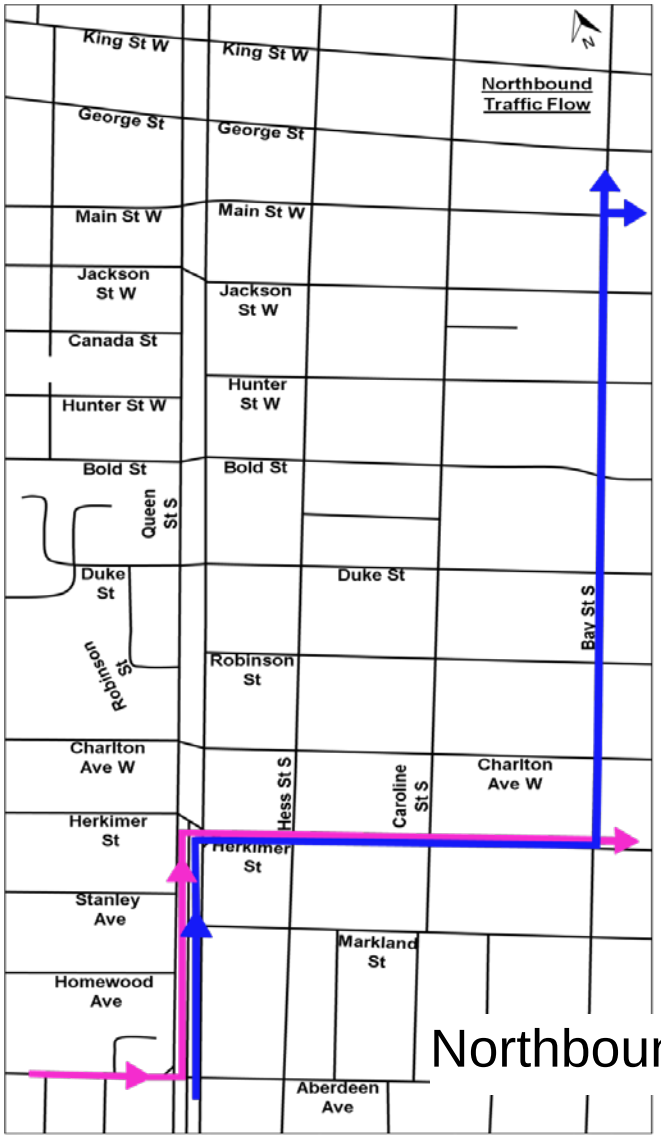
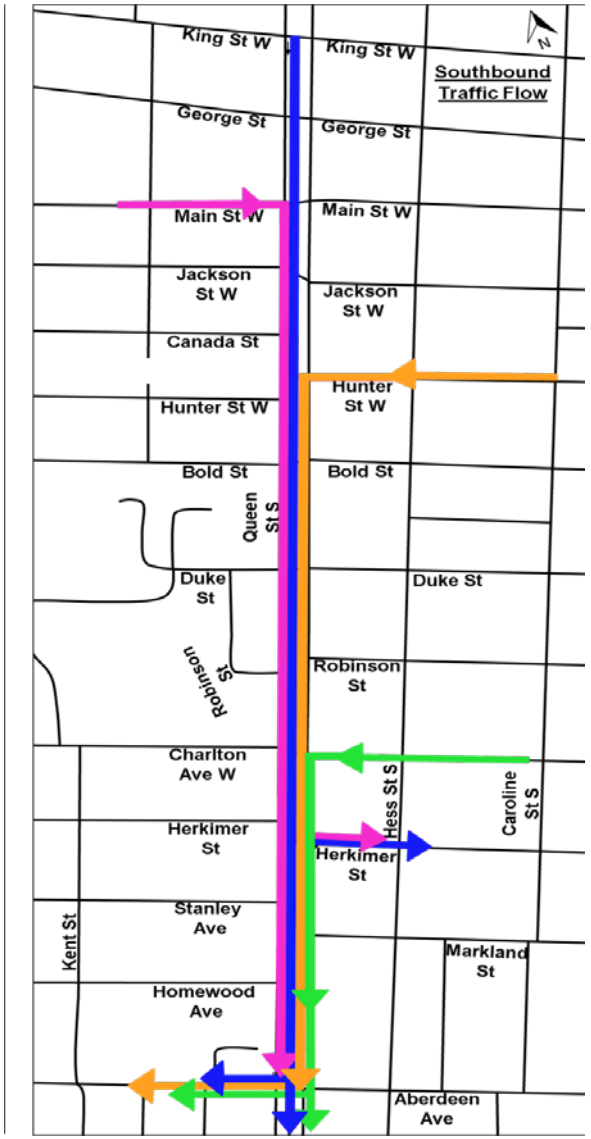
Major Traffic Flow Patterns



Northbound

Southbound



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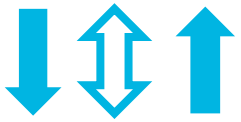
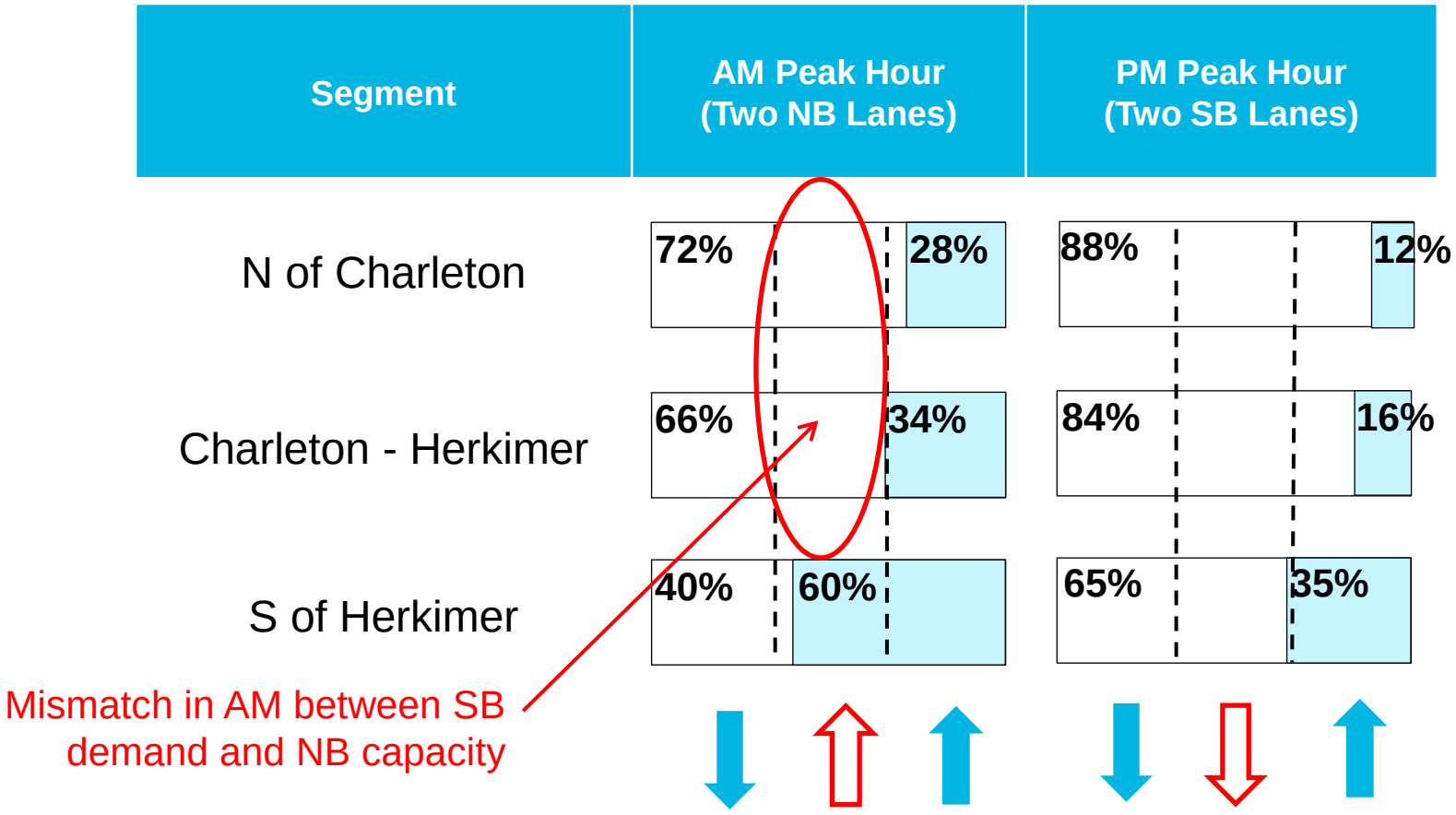
Two-way Alternatives Considered

No.	Description	Configuration
x	Existing: Three southbound lanes with off-peak parking	
1	One lane in each direction with a centre two-way left-turn lane (TWLTL)	
2	One lane in each direction with all-day on-street parking on the east side	
3	One northbound lane and two southbound lanes	
4	One lane in each direction with a reversible lane	
5	Two northbound lanes and one southbound lane	

Traffic Directional Split with Reversible Lane



Initial Screening of Alternatives (North of Herkimer)

Altern-ative	Screening Analysis	Carry Forward?
Existing	Does not provide two-way operation	No
1	Feasible; some concerns	Yes
2	Feasible; some concerns	Yes
3	Capacity generally matches demand	Yes – preferred option
4	Some “tidal flow” demand pattern, but peak demand is always SB so having two NB lanes half the time has no benefit	Not technically preferred, but set aside for Council consideration
5	Majority of road space is reserved for NB traffic, but majority of demand is SB	No

Analysis Criteria

– Technical analysis and City staff input covered:

- Traffic Operations
- Parking
- Property Access
- Safety
- HSR Operations
- Emergency Services Operations (Ambulance)
- Fire
- Waste Collection
- Road Maintenance
- Winter Control
- Heritage
- Capital and Operating Cost

Analysis

Evaluation Criteria	Alternative			
	1	2	3	4
	NB + SB + TWLTL	NB + SB + Parking	NB + 2 SB	Reversible Lane
Significant Difference Between Alternatives				
Traffic Operations	◑	○	◑	◑
Parking	○	●	○	○
HSR	○	◑	●	○
EMS	◑	○	●	○
Fire Services	◑	◑	●	◑
Road Maintenance / Snow	◑	◑	◑	○
Safety	◑	◑	◑	○
Capital & Operating Cost	◑	◑	◑	○
No Significant Difference Between Alternatives				
Property Access	-			
Waste Collection	-			
Heritage	-			

Good / Best ● Fair / Medium ◑ Poor / Worst ○

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Implementation Actions

Alternative 3 Capital Cost Estimate

• Traffic signals			
	New (1)	$350,000	
	Modified (3) + 1 - IPS	$350,000	$ 700,000
• Pavement markings and signage			$ 30,000
• Removal of island (Herkimer)			$ 24,000
• Removal of Pedestrian Crossover (Herkimer)			$ 10,000
		Sub-total	**$ 764,000**
• Contingency (10%)			$ 76,400
• Detailed Design			$ 200,000
• Tender document preparation			$ 50,000
• Communications Plan			$ 10,000
		TOTAL	**$1,100,400***

*** Note:** Civil improvement costs to be determined during detailed design may include property acquisition if left turn lanes are required, intersection radii, sidewalk replacement / widening, utilities and property impact mitigation (e.g. fences, walls)

HSR (if traffic delays affect HSR to the point where additional service is required):

Additional bus: **$ 640,000**

Alternative 3 Annual Operating Cost Estimate

- Snow Removal

  $20,000 per event x (potentially) up to 8 events per year $160, 000

- Operations & Maintenance $0
- Waste collection $0
- Fire $0
- EMS $0

TOTAL $ 160,000 per year

Potential Additional Cost:

- **HSR** (if traffic delays affect HSR to the point where additional service is required):

3,500 service hours and two Full Time Equivalent staff = $275,000 per year

Hamilton LRT Project

- Two-Way Conversion Study Area extends to King Street
- King Street LRT plans are currently under development
- Impact of traffic diversion to / around Queen Street due to LRT project has not yet been determined
- If Queen Street conversion goes ahead, it would be best to defer the portion north of Main Street until the LRT program is finalized
- If two-way conversion is endorsed, the segment between Main and King can be implemented at a later date

Study Outcome

– Conversion of Queen Street to two-way operation between King Street and Aberdeen Avenue (Herkimer Avenue) is physically and operationally feasible.
  - There are several ways to convert the three lanes to two-way operation.

– Alternative 3 is preferred if Council indicates this is a priority :
  - one lane northbound and two lanes southbound between Main Street and Herkimer Avenue;
  - the section between Herkimer Avenue and Aberdeen Avenue would remain as is, two lanes southbound with two lanes northbound.
  - Extend the configuration from Main Street to King Street if, and when, that is demonstrated to be compatible with the future King Street LRT plans.
  - Estimated capital cost is $1,100,400 (subject to detailed design) with estimated additional annual operating costs of up to $160,000

– A reversible lane conversion is physically and operationally possible. If Council wishes it to be implemented

Options for Council Consideration

A. Maintain current one-way operation

B. Implement preferred Alternative (2 lanes SB, 1 lane NB)
   - Could include work in 2018 capital budget, or in future budget
   - Could split project into two phases, i.e Main Street to Herkimer Avenue and defer the segment north of Main Street until LRT impact determined

C. Defer entire project implementation until LRT impact determined

D. Implement reversible lane plan (Alternative 4)

If conversion implementation is endorsed:

A. Undertake Public Engagement process

B. Determine timing and funding source(s) and adjust budget accordingly

C. Amend road and traffic bylaws as appropriate

For further information:

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