City of Saskatoon

Brevoort Park Neighbourhood Traffic Review



Transportation & Utilities Department

Acknowledgements

The completion of this review would not be possible without the contribution of the following organizations and individuals:

- Brevoort Park residents
- Brevoort Park Community Association
- Saskatoon Police Service
- Saskatoon Light & Power
- City of Saskatoon Fire Department
- City of Saskatoon Environmental Services
- City of Saskatoon Transit
- City of Saskatoon Transportation
- Great Works Consulting
- Councillor Eric Olauson

Executive Summary

The objective of the Neighbourhood Traffic Management Program is to address traffic concerns within neighbourhoods such as speeding, shortcutting, and pedestrian safety. The program was revised in August 2013 to address traffic concerns on a neighbourhood-wide basis. The revised program involves additional community and stakeholder consultation that provides the environment for neighbourhood residents and City staff to work together in developing solutions that address traffic concerns. The process is outlined in the *Traffic Calming Guidelines and Tools*, City of Saskatoon, 2013.

A public meeting was held in January of 2014 to identify traffic concerns and potential solutions within the Brevoort Park neighbourhood. As a result of the meeting a number of traffic assessments were completed to confirm and quantify the concerns raised by the residents. Based on the residents input and the completed traffic assessments, a Traffic Management Plan was developed and presented to the community at a follow-up meeting held in September 2014.

A summary of recommended improvements for the Brevoort Park neighbourhood are included in **Table ES-1**. The summary identifies the locations, the recommended improvement, and a schedule for implementation. The schedule to implement the Traffic Management Plan can vary depending on the complexity of the proposed improvement. According to the *Traffic Calming Guidelines and Tools* document, the time frame may range from short-term (1 to 2 year); medium-term (3 to 5 years) and long-term (5 years plus). Accordingly, the specific time frame to implement the improvements for these neighbourhoods ranges from 1 to 5 years.

The resulting proposed Brevoort Park Traffic Management Plan is illustrated in **Exhibit ES-1**.

Location	Proposed Measure	Time Frame
Arlington Ave (south of Baldwin Cres)	"No parking" signs on southeast corner or Arlington Ave (approximately 7m)	
Arlington Ave & Early Dr	Standard pedestrian crosswalk	
Early Dr & Salisbury Dr	Remove temporary traffic calming; alter direction of stop signs	
Early Dr & curve west of Salisbury Dr	"Curve ahead" signs & chevrons	
Salisbury Dr at curve west of Conn Ave	Permanent median islands	
Salisbury Dr & lane leading to park	Standard pedestrian crosswalk	1 to 2 years
3rd St & Argyle Ave	Two-way stop	
3rd St & Tucker Cres	Two-way stop	
Back lanes – west of Argyle Ave	20kph speed signs	
Back lanes - north of Taylor St	20kph speed signs	
Back lane - west of Arlington Ave	One-way signs	
Brevoort Park School & St. Matthew School	Drop-off / Pick-up zone	
In front of Brevoort Park School & St. Matthew School	Parking enforcement (i.e. parking over crosswalks, blocking driveways)	
Early Dr & Webb Cres	Raised median island	3 to 5 years (devices
Early Dr & Phillips Cres (west)	Raised median island	will be installed
Arlington Ave & Early Dr	Raised median island	effective)
Taylor St & Arlington Ave	Major intersection review	5 years plus

Table ES-1: Brevoort Park Neighbourhood Recommended Improvements



LEGEND **EXISTING STOP SIGN** EXISTING YIELD SIGN **BUS ROUTE EXISTING TRAFFIC SIGNAL** PEDESTRIAN ACTUATED SIGNAL LOCATION EXISTING TRAFFIC CALMING LOCATION LOCATION MEASURE PROPOSED "No Parking" signs on southeast corner of Arlington Ave (approximately 7m) Median island & standard pedestrian crosswalk Remove temporary traffic calming, alter direction of stop signs "Curve Ahead" signs & chevrons Permanent median islands Standard pedestrian crosswalk 2-way stop 2-way stop 20kph speed signs 20kph speed signs One-way sign Drop off/Pick-up zone Parking enforcement (ie. parking over crosswalks, blocking driveways, etc.) Major intersection review Install median island Install median island

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LIST OF EXHIBITS

1. Introduction

The purpose of this review was to develop a Traffic Management Plan for the Brevoort Park neighbourhood following the implementation procedure outlined in the *City of Saskatoon Traffic Calming Guidelines and Tools* adopted by City Council in August 2013.

The Brevoort Park neighbourhood is located on the east side of the South Saskatchewan River and is bound by Circle Drive to the east, 8th Street East to the north, Taylor Street to the south, and Preston Avenue to the west. The area use is mostly residential, with elementary schools (Brevoort Park School on Early Drive, and Arlington Avenue St. Matthew School), and some commercial land use adjacent to 8th Street.

The development and implementation of the traffic management plan includes four stages:

- **Stage 1** Identify existing problems, concerns and possible solutions through the initial neighbourhood consultation and the Shaping Saskatoon Website.
- **Stage 2** Develop a draft traffic plan based on resident's input and traffic assessments.
- **Stage 3** Present the draft traffic plan to the neighbourhood at a follow-up meeting; circulate the plan to other civic divisions for feedback; make adjustments as needed; and present the plan to City Council for approval.
- Stage 4 Implement the proposed measures in specific time frame, short-term (1 to 2 years), medium-term (3 to 5 years) or long-term (5 years plus).

2. Identifying Issues, Concerns, & Possible Solutions

A public meeting was held in January of 2014 to identify traffic concerns within the neighbourhood. At the meeting, residents were given the opportunity to express their concerns and suggest possible solutions.

The following pages summarize the concerns and suggested solutions identified during the initial consultation with the neighbourhood residents.

1

CONCERN 1 – SPEEDING AND SHORTCUTTING

Shortcutting occurs when non-local traffic passes through the neighbourhood on local streets which are designed and intended for low volumes of traffic. In the case of Brevoort Park, the bordering arterial streets (8th Street, Taylor Street, and Preston Avenue) are designated to accommodate larger volumes of traffic.

As speeding often accompanies shortcutting, these concerns have been grouped into one category.

Neighbourhood concerns for speeding and shortcutting were at the following locations:

- 7th Street
- Arlington Avenue
- Salisbury Drive
- Early Drive: south of 7th Street, around curves
- Sparling Crescent: parents dropping off / picking up students
- Phillips Crescent
- Back lanes north of Taylor Street
- Back lanes near parks
- Back lane north of Taylor Street & Arlington Avenue intersection (avoiding traffic signals)
- Back lanes off of Argyle Avenue
- Truck traffic on Preston Avenue

- Install speed humps
- Install median on Early Drive at curve
- Install 20kph speed sign in back lanes

CONCERN 2 - PEDESTRIAN SAFETY

A majority of the residents were concerned about pedestrian safety surrounding the school sites within Brevoort Park (St. Matthew School, Brevoort Park School).

Pedestrian crosswalks need to adhere to the City of Saskatoon Council Policy C07-018 *Traffic Control at Pedestrian Crossings*, November 15, 2004 which states the following:

"The installation of appropriate traffic controls at pedestrian crossings shall be based on warrants listed in the document entitled "Traffic Control at Pedestrian Crossings – 2004" approved by City Council in 2004."

Neighbourhood concerns regarding pedestrian safety were at the following locations:

- Arlington Avenue at Early Drive and Salisbury Drive
- Salisbury Drive near the alley that leads to the park
- Early Drive near Brevoort Park School
- U-turns in school zones (Taylor Street & Early Drive)

- Arlington Avenue and Early Drive: install a median and activated pedestrian device
- Extend the school zone on Arlington Avenue to Early Drive
- Implement crossing guards for the schools
- Install midblock crossing on Salisbury Drive at the alley that leads to the park
- Install four-way stops or activated pedestrian devices on Early Drive
- More time needed for pedestrians to cross traffic signal locations on 8th Street
- Extend school zone on west end of Early Drive to west end of Madden Avenue

CONCERN 3 - TRAFFIC CONTROL

Traffic control signs are used in order to assign the right-of-way and must meet guidelines in City of Saskatoon Council Policy C07-007 *Traffic Control – Use of Stop and Yield Signs*, January 26, 2009 which states that stop and yield signs are not to be used as speed control devices, to stop priority traffic over minor traffic, on the same approach to an intersection where traffic signals are operational, or as a pedestrian crossing device.

An all-way stop must meet the conditions for traffic volume, collision history, and must have a balanced volume from each leg to operate sufficiently.

Neighbourhood concerns regarding traffic control improvements were are at the following intersections:

- Taylor Street / Arlington Avenue: westbound traffic is using a dedicated right turn lane for through movements; left turn signal is not activated and causes further congestion; need longer left turn bay; issues with lane designation & signage; more green time required on Arlington Avenue
- Arlington Avenue: southbound drivers are using parking lane as driving lane
- 7th Street / Arlington Avenue: difficult to turn left
- 8th Street: (particularly at Arlington Avenue) difficult to turn left at traffic signal locations; lane designation is confusing

- Install curb on Arlington Avenue (similar to the Preston Avenue / 14th Street intersection) to restrict drivers from using right lane as driving lane
- Install stop or yield signs on 3rd Street between Preston Avenue / Early Drive
- 8th Street: include left turn arrows for both directions at traffic signals; lane designation signs needed

CONCERN 4 – PARKING

Parking is allowed on all city streets unless signage is posted. According to City of Saskatoon Bylaw 7200, *The Traffic Bylaw*, December 16, 2013, vehicles are restricted from parking within 10 metres of an intersection and one metre of a driveway crossing.

Neighbourhood concerns regarding parking were at the following locations:

- Taylor Street: congested due to parking near schools
- Arlington Avenue: congested (especially during morning peak hours) near Sparling Crescent & Clark Crescent due to parking in front of schools; parents dropping off/picking up students
- Baldwin Crescent: difficult to see northbound drivers from Taylor Street due to parked cars
- Students parking on Madden Avenue and Phillips Crescent
- Parking near intersection of 7th Street / Arlington Avenue is obstructing driver's view
- Parking too close to alleys on Taylor Street & Cameron Avenue
- Parking over crosswalks in school zones
- Students parking on Phillips Crescent are disrespectful to residents. They park on Phillips Crescent and use the walkway on the south end to get to Taylor Street. They block resident's driveway, leave their garbage, vandalize property, and speed down the crescent.

- Parking enforcement
- Remove parking on Taylor Street or no parking during peak times
- Change drop off zone locations near schools on Taylor Street
- Move drop off zones onto school property
- Remove parking on east side of Arlington Avenue near St. Matthews School
- School patrol parking
- Remove parking around median islands on Salisbury Drive
- Install drop off loop for schools
- Inform residents directly affected by parking restrictions

CONCERN 5 – MAINTENANCE

A majority of the residents were concerned about the condition of the streets in Brevoort Park (i.e. snow clearing, potholes, tree trimming, and temporary traffic calming devices).

Neighbourhood concerns regarding maintenance were at the following locations:

- Snow clearing needed on: 7th Street; and Taylor Street between Arlington Avenue and Circle Drive interchange
- Motorists are driving over sidewalk on Early Drive when there's snow
- Snow is pushed onto sidewalk forcing pedestrians to walk on the street
- Temporary medians islands on Salisbury Drive need to be fixed
- Potholes in back lanes
- Raised median islands are difficult to see in winter; should be higher

- Trim trees on Baldwin Crescent to improve sightlines
- Pave back lanes

3. Assessment

Stage 2 of the plan development included developing a draft traffic management plan. This was completed through the following actions:

- Create a detailed list of all the issues provided by the residents.
- Collect historical traffic data and information the City has on file for the neighbourhood.
- Prepare a data collection program that will provide the appropriate information needed to undertake the assessments.
- Complete the data collection, which may include:
 - Intersection turning moving counts
 - Pedestrian counts
 - Daily and weekly traffic counts
 - o Average speed measurements
- Assess the issues by using the information in reference with City policies, bylaws, and guidelines, transportation engineering design guidelines and technical documents, and professional engineering judgement.

The following sections provide details on the data collected for traffic volumes (peak hours, daily, and weekly), travel speed, and pedestrian movements.

1. Traffic Volumes and Travel Speeds

Traffic volumes and travel speeds were measured to assist in determining the need for traffic calming devices. In Saskatoon the neighbourhood streets are classified typically as either local or collector streets. Traffic volumes (referred to as Average Daily Traffic) on these streets should meet the City of Saskatoon guidelines shown in **Table 3-1**.

	Classifications						
Characteristics	Back Lanes		Locals		Collectors		
	Residential	Commercial	Residential	Commercial	Residential	Commercial	
Traffic function	Access function only (traffic movement not a consideration)		Access primary function (traffic movement secondary consideration)		Traffic movement and land access of equal importance		
Average Daily Traffic (vehicles per day)	<500	<1,000	<1,000	<5,000	<5,000	8,000-10,000	
Typical Speed Limits (kph)		20		50		50	
Transit Service	Not permitted		Generally avoided		Per	Permitted	
Cyclist	No restrictions or special facilities		No restrictio	ons or special ilities	No restrictio	ons or special ilities	
Pedestrians	Permitted fac	l, no special ilities	Sidewalks on one or both sides	Sidewalks provided where required	Typically sidewalks provided both sides	Sidewalks provided where required	
Parking	Some restrictions		No restrictior on one	ns or restriction side only	Few restricti pea	ons other than k hour	

Table 3-1: City of Saskatoon Street Classifications and Characteristics

Travel speeds were measured to determine the 85th percentile speed, which is the speed at which 85 percent of vehicles are travelling at or below. The speed limit in the Brevoort Park area is 50kph, except for school zones where the speed limit is 30kph from September and June, 8:00am to 5:00pm, excluding weekends.

The speed studies and Average Daily Traffic (ADT) on streets where speeding was identified as an issue are summarized in **Table 3-2**.

Street	Between	Classification	Average Daily Traffic (vpd)	Speed (kph)
Back Lane north of Taylor Street	Cameron Avenue & Arlington Avenue		368	not assessed
Back Lane east of Salisbury Drive	Taylor Street & Early Drive	Lane	48	not assessed
Back Lane north of Taylor Street	Madden Avenue & Cameron Avenue		42	not assessed
Early Drive	Phillips Crescent & Phillips Crescent (school zone)		1,127	30.7 (school hours) & 44.7 (regular hours)
Early Drive	Tucker Crescent & 3rd Street	Local	1,228	45.5
Phillips Crescent	Midblock		205	33.4
Salisbury Drive	Early Drive & McLellan Avenue		576	44.3
7th Street	Conn Avenue & Harris Avenue	Collector	3,200	not assessed
Arlington Avenue	Sparling Crescent & Baldwin Crescent	Major Collector	4,501	51.8

Table 3-2: Speed Studies and Average Daily Traffic Counts (2014)

2. Turning Movement Counts

Turning movement counts were completed to determine the need for an all-way (i.e. three-way or four-way) stop control. All-way stop controls need to the meet City of Saskatoon Council Policy C07-007 Traffic Control – Use of Stop and Yield Signs, January 26, 2009. Criteria outlined in the policy that may warrant an all-way stop include a peak hour count greater than 600 vehicles or an ADT greater than 6,000 vehicles per day. Results of the studies are shown in **Table 3-3**.

Table 3-3: All-Way Stop Assessments

Location	Peak Hour Traffic Count	Average Daily Traffic (vpd)	Results
Arlington Avenue (north leg) & 7th Street	641	6,540	All-way Stop Not
Early Drive & Salisbury Drive	247	2,730	vvarianteu

As a result of the assessment there are no all-way stop controls recommended. Details of the all-way stop assessments are provided in **Appendix A**.

3. Pedestrian Assessments

Pedestrian assessments are conducted to determine the need for pedestrian actuated signalized crosswalks which, in adherence to the City of Saskatoon Council Policy C07-018 Traffic Control at Pedestrian Crossings, November 15, 2004, are typically active pedestrian corridor (flashing yellow lights) or pedestrian-actuated signals. A warrant system assigns points for a variety of conditions that exist at the crossing location, including:

- The number of traffic lanes to be crossed;
- the presence of a physical median;
- the posted speed limit of the street;
- the distance the crossing point is to the nearest protected crosswalk point; and
- the number of pedestrian and vehicles at the location.

Pedestrian and traffic data is collected during the five peak hours of: 8:00am-9:00am, 11:30am-1:30pm, and 3:00pm-5:00pm.

In addition, if a pedestrian actuated crosswalk is not warranted, a standard marked pedestrian crosswalk, or a zebra crosswalk (i.e. striped) may be considered. A summary of the pedestrian studies are provided in **Table 3-4**.

Table 3-4: Pedestrian Assessment

Location	Number of pedestrians crossing	Results
Salisbury Drive & back lane to park (East of Conn Avenue)	26	Pedestrian Devices Not
Early Drive & Salisbury Drive	59	warranted

As a result of the assessment, no pedestrian devices are recommended. Details of the pedestrian device assessments are provided in **Appendix B**.

4. Plan Development

Stage 3 of the review included finalizing the recommended plan. This was achieved by completing the following steps:

- Based on the assessments, prepare a plan that illustrates the appropriate recommended improvement
- Present the draft plan to the residents at a follow-up public meeting
- Circulate the draft plan to the Civic Divisions for comment
- Revise the draft plan based on feedback from the stakeholders
- Prepare a technical document summarizing the recommended plan and project process

The tables in the following sections provide the details of the recommended traffic management plan, including the location, recommended improvement, and the justification of the recommended improvement.

1. Shortcutting and Speeding

The traffic volume and the 85th percentile speed were higher than expected on Early Drive near the Brevoort Park School and on Arlington Avenue near St. Matthew School. Back lanes north of Taylor Street were also a concern for shortcutting due to the nearby schools on Taylor Street. The recommended improvements and justification to address speeding and shortcutting are detailed in **Table 4-1**.

Location	Recommended Improvement ¹	Justification
Arlington Avenue & Early Drive	Raised median island	Reduce speed near schools (school route, transit route)
Early Drive & Webb Crescent	Raised median island	Reduce speed near Brevoort Park School
Early Drive & Phillips Crescent (west)	Raised median island	Reduce speed near Brevoort Park School
Early Drive at curve west of Salisbury Drive	"Curve ahead" signs & chevrons	Reduce speed around curve
Salisbury Drive at curve west of Conn Avenue	Permanent raised median islands	Reduce speed around curve
Back lanes – north of Taylor Street	20kph speed sign	Reduce speed
Back lane – west of Arlington Avenue	One-way sign	Restrict shortcutting (i.e. restrict westbound movement from Arlington Avenue north of Taylor Street intersection)
Back lane - west of Argyle Avenue (7 th Street & Taylor Street accesses)	20kph speed sign	Reduce speed; passively reduce shortcutting

Table 4-1: Recommended Improvements to Reduce Speeding and Shortcutting

¹ For details on these devices refer to the *City of Saskatoon Traffic Calming Guidelines and Tools*

2. Pedestrian Safety

Brevoort Park residents identified pedestrian safety near Brevoort Park School and St. Matthew School as a priority. The safety of the pedestrian environment near schools is important to encourage people to walk to school, as opposed to being dropped off. Accordingly, the recommended improvements to increase pedestrian safety are detailed in **Table 4-2**.

Location	Recommended Improvement	Purpose
Arlington Avenue & Early Drive	Raised median island & standard pedestrian crosswalk	Improve pedestrian safety near schools (school route, transit route)
Early Drive & Webb Crescent	Raised median island	Improve pedestrian safety near Brevoort Park School
Early Drive & Phillips Crescent (west)	Raised median island	Improve pedestrian safety near Brevoort Park School
Salisbury Drive & back lane east of Conn Avenue	Standard pedestrian crosswalk	Improve pedestrian safety (connects to Brevoort Park North & Brevoort Park School)
St. Matthew School	Implement Drop-off & Pick-Up Zone	Improve pedestrian safety

Table 4-2: Recommended Pedestrian Safety Improvements – School Sites

It should be noted, implementation of the Drop-off & Pick-up Zone is based on the discretion of the schools (more information provided at <u>saskatoon.ca</u> click on "S" for School Zones).

3. Traffic Control

The recommended improvements to intersections that will improve the level of safety by clearly identifying the right-of-way through traffic controls are provided in **Table 4-3**.

 Table 4-3: Recommended Traffic Control Improvements

Location	Recommended Improvement	Purpose
Early Drive & Salisbury Drive	Remove temporary traffic calming; Alter direction of 2-way stop (facing Salisbury Drive)	Traffic volumes are higher on Early Drive (66% of total intersection volume); according to Policy C07-007 – Traffic Control – Use of Stop & Yield Signs, stop signs are not to be used to stop priority traffic over minor traffic
3 rd Street & Argyle Avenue	2-way stop	Enhance compliance
3 rd Street & Tucker Crescent	2-way stop	Enhance compliance

4. Parking Improvements

The recommended improvements to parking that will improve parking control, lower the impact on residents, and improve the level of safety at specific intersections is detailed in **Table 4-4**.

Table 4-4: Recommended	Parking	Improvements
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Location	Recommended Improvement	Purpose
Arlington Avenue (southeast corner of Baldwin Crescent)	"No parking" sign (approximately 17m from intersection)	Improve sightlines
Near Brevoort Park School & St. Matthew School	Parking enforcement	Parking over crosswalks, blocking back lanes, parking for longer than allowed times

During the public consultation residents voiced their concerns regarding parking on Phillips Crescent. Many students park on the crescent due to the walkway on the south end that provides a quick access to the high schools on Taylor Street. Residents reported littering, parked vehicles obstructing their driveways, vandalism, and concerns for speeding. Parking Services is following up with a review to determine the need for implementation of time parking restrictions to alleviate their concerns.

5. Major Intersection Reviews

The mandate for the Neighbourhood Traffic Management Reviews is to focus on neighbourhood streets such as local roads and collector roads. As almost all neighbourhood are bound by arterial streets, such as 8th Street or Taylor Street, it is not uncommon to have residents raise issues regarding these streets. However, arterial streets are much more complex than local or collector streets due to larger traffic volumes, different types of drivers (commuters), coordinated traffic signals, transit accommodation, and potentially many commercial accesses. To properly address these, the typical transportation engineering approach would require a corridor study or a major intersection review, both of which are expensive and time-consuming. Through the Neighbourhood Traffic Reviews, the City is compiling a list of issues on arterial streets. The Transportation Division is working to prioritize the issues, identify the work requirements, and securing funding to complete these types of assessments.

Follow up Consultation – Presentation of Traffic Management Plan

The initial recommended improvements were presented at a follow-up public meeting in September 2014. Recommended improvements that were not supported by the residents were eliminated or altered accordingly. A decision matrix detailing the list of recommended improvements presented at the follow-up meeting are included in **Appendix C**. A decision matrix for additional comments received after the draft traffic plan is also included in **Appendix C**.

The following table displays a list of the improvements that were adjusted based on the feedback received at the September 2014 follow up meeting.

Table 4-5: Adjusted Recommended Improvements

Location	Improvement	Reason	Resident Feedback	Decision
Early Drive & Salisbury Drive	Permanent curb extensions & raised median island	Improve pedestrian safety near school & park	Existing temporary traffic calming is doing little to reduce speed; consider 4-way stop instead	Remove existing temporary traffic calming; alter direction of 2-way stop to face minor street (ie. Salisbury Drive)
Salisbury Drive near back lane leading to Brevoort Park North	Advanced warning sign for pedestrians	Improve pedestrian safety (lane leads to park)	Install pedestrian crosswalk instead	Install standard pedestrian crosswalk

The list of the improvements that were added based on the feedback received at the follow up meeting held in September 2014 is shown in **Table 4-6**.

Table 4-6: Added Improvements

Location	Improvement	Reason
Near Brevoort Park School & St. Matthew School	Parking enforcement	Parking over crosswalks, blocking back lanes, parking for longer than allowed times
St. Matthew School	Implement Pick-up / Drop-off zone (based on school board discretion)	Improve pedestrian safety

All Civic Divisions supported the Traffic Management Plan, with Transit specifically commenting that all devices installed allow Transit vehicles to manoeuvre around them without causing damage to the structure. Accordingly, the proposed recommendation for the intersection of Arlington Avenue & Early Drive was reviewed to ensure transit could complete all turning movements.

5. **Recommended Plan and Cost Estimates**

Stage 4, the last stage of the process, is to install the recommended improvements for the Brevoort Park neighbourhood within the specified timeframe. The timeframe depends upon the complexity and cost of the solution. A short-term time frame is defined by implementing the improvements within 1 to 2 years; medium-term is 3 to 5 years; and long-term is 5 years plus.

The placement of pedestrian and traffic control signage will be completed short-term (1 to 2 years).

All traffic calming measures will be installed temporarily using rubber curbing until proven effective, and will be implemented short-term (1 to 2 years).

Permanent traffic calming often includes removing the temporary barriers and reconstructing with concrete. The timeline for permanent traffic calming may depend on the complexity of the device and the availability of funding; therefore the timeline is medium-term (3 to 5 years).

Major intersection reviews are based on the number of other locations to be reviewed city-wide and the availability of funding. The timeline for review will be medium-term (3 to 5 years).

The estimated costs of the improvements included in the Neighbourhood Traffic Management Plan are outlined in the following tables:

- **Table 5-1**: Traffic Calming Cost Estimate
- Table 5-2: Marked Pedestrian Crosswalks Cost Estimate
- **Table 5-3**: Traffic Control Signage Stop & Yield Cost Estimate
- Table 5-4: Miscellaneous Signage Cost Estimate
- **Table 5-5**: Major Intersection Review Cost Estimate

Location	Troffic Colming Dovice (c)	Cost Estimate Temporary Permanent		- Time Frame	
Location	Trainc Caiming Device (S)				
Arlington Avenue & Early Drive	Raised median island	\$500	\$6,000		
Early Drive & Webb Crescent	Raised median island	\$500	\$6,000		
Early Drive & Phillips Crescent (west)	Raised median island	\$500	\$6,000	T to 5 years	
Salisbury Drive at curve west of Conn Avenue	Permanent raised median islands	NA	\$12,000		
	Total	\$1,500	\$30,000		

Table 5-1: Traffic Calming Cost Estimate

Temporary traffic calming will be installed in 2015 and will be monitored to determine its effectiveness. If proven effective, the devices will be made permanent. Until they are made permanent, the devices will remain temporary and maintained on a yearly basis. An estimated cost for maintenance is about \$5,000 per year. The maintenance typically involves the replacement of damage curbs as result of snow removal, damage from vehicle impact, etc.

 Table 5-2: Marked Pedestrian Crosswalks Cost Estimate

Location	Device (s)	Cost Estimate	Time Frame
Arlington Avenue & Early Drive	4 signs & standard markings	\$1,200	1 to 2 vooro
Salisbury Drive & back lane east of Conn Avenue	4 signs & standard markings	\$1,200	T to z years
	Total	\$2,400	

The operating cost on an annual basis to maintain a crosswalk is approximately \$60 each.

Location	Device (s)	Number of Signs	Cost Estimate	Time Frame
Early Drive & Salisbury Drive	Remove temporary traffic calming; Alter direction of 2-way stop (facing Salisbury Drive)	none	\$0	
3 rd Street & Argyle Avenue	Stop signs	2	\$500	1 to 2 years
3 rd Street & Tucker Crescent	Stop signs	2	\$500	
	-	Total	\$1,000	

Table 5-3: Traffic Control Signage – Stop & Yield Cost Estimate

Table 5-4: Miscellaneous Signage Cost Estimate

Location	Sign	Number of Signs	Cost Estimate	Time Frame
Early Drive at curve west of Salisbury Drive	"Curve Ahead" & Chevron	4	\$1,000	
Back lanes – north of Taylor Street	20kph speed limit	5	\$1,250	
Back lane – west of Arlington Avenue	One-way	1	\$250	1 to 5 years
Arlington Avenue (southeast corner of Baldwin Crescent)	"No parking"	1	\$250	
		Total	\$2,750	

Table 5-5: Major Intersection Review Cost Estimate

Location	Improvement	Cost Estimate	Time Frame
Taylor Street & Arlington Avenue	Review traffic signal timing & geometric improvements	\$30,000	1 to 5 years
	Total	\$30,000	

The total cost estimate for the signage and temporary traffic calming devices to be installed in 2015 is **\$7,650**. The total cost estimate, including the installation of future permanent traffic calming and major intersections reviews is **\$67,650**.

Resulting from the plan development process, the recommended improvements, including the location, type of improvement, and schedule for implementation are

summarized in **Table 3-1**. The resulting recommended Brevoort Park Neighbourhood Traffic Management Plan is illustrated in **Exhibit 5-1**.

Location	Proposed Measure	Time Frame
Arlington Avenue (south of Baldwin Crescent)	"No parking" signs on southeast corner or Arlington Ave (approximately 7m)	
Arlington Avenue & Early Drive	Standard pedestrian crosswalk	
Early Drive & Salisbury Drive	Remove temporary traffic calming; alter direction of stop signs	
Early Drive & curve west of Salisbury Drive	"Curve ahead" signs & chevrons	
Salisbury Drive at curve west of Conn Avenue	Permanent median islands	
Salisbury Drive & lane leading to park	Standard pedestrian crosswalk	
3rd Street & Argyle Avenue	2-way stop	1 to 2 years
3rd Street & Tucker Crescent	2-way stop	
Back lanes – west of Argyle Avenue	20kph speed signs	
Back lanes - north of Taylor Street	20kph speed signs	
Back lane - west of Arlington Avenue	One-way signs	
Brevoort Park School & St. Matthew School	Drop-off / Pick-up zone	
In front of Brevoort Park School & St. Matthew School	Parking enforcement (ie. parking over crosswalks, blocking driveways)	
Early Drive & Webb Crescent	Raised median island	3 to 5 years (devices
Early Drive & Phillips Crescent (west) Raised median island		will be installed temporarily until proven
Arlington Avenue & Early Drive	Raised median island	effective)
Taylor Street & Arlington Avenue	Major intersection review	5 years plus

Table 5-6: Brevoort Park Neighbourhood Recommended Improvements



LEGEND **EXISTING STOP SIGN** EXISTING YIELD SIGN **BUS ROUTE EXISTING TRAFFIC SIGNAL** PEDESTRIAN ACTUATED SIGNAL LOCATION EXISTING TRAFFIC CALMING LOCATION LOCATION MEASURE PROPOSED "No Parking" signs on southeast corner of Arlington Ave (approximately 7m) Median island & standard pedestrian crosswalk Remove temporary traffic calming, alter direction of stop signs "Curve Ahead" signs & chevrons Permanent median islands Standard pedestrian crosswalk 2-way stop 2-way stop 20kph speed signs 20kph speed signs One-way sign Drop off/Pick-up zone Parking enforcement (ie. parking over crosswalks, blocking driveways, etc.) Major intersection review Install median island Install median island

(1)

2

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(11)

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16

Appendix A

All Way Stop Assessments

All-way Stop Assessment (Policy C07-007 – Traffic Control – Use of Stop & Yield Signs)

The following conditions must be met for all-way stop control to be considered:

i) The combined volume of traffic entering the intersection over the five peak hour periods from the minor street must be at least 25% of the total volume for a three-way stop control, and at least 35% of the total volume for a four-way stop control.

ii) There can be no all-way stop control and traffic signal within 200 metres of the proposed intersection being considered for all-way stop control on either of the intersecting streets.

Location	Condition 1: Combined volume of traffic entering intersection from minor street is at least 25% for 3-way stop or 35% for 4-way stop	Condition 2: There can be no all-way stop or traffic signal within 200m	Results
Arlington Avenue (north leg) & 7th Street	33% - Condition met	170m from traffic signal at 8 th St – Condition NOT met	Conditions not met therefore all-way stop NOT warranted
Early Drive & Salisbury Drive	34% - Condition NOT met	No all-way stop or traffic signals within 200m – Condition met	Since Condition 1 is only 1% less than requirement check additional warrant criteria.

Provided the above criteria are met, the following conditions, singly or in combination, may warrant the installation of all-way stop signs:

i) When five or more collisions are reported in the last twelve month period and are of a type susceptible to correction by an all-way stop control.

ii) When the total number of vehicles entering the intersection from all approaches averages at least 600 per hour for the peak hour or the total intersection entering volume exceeds 6,000 vehicles per day.

iii) The average delay per vehicle to the minor street traffic must be 30 seconds or greater during the peak hour.

iv) As an interim measure to control traffic while arrangements are being made for the installation of traffic signals.

Location	Criteria 1: 5 or more collisions in last twelve months	Criteria 2: at least 600 vehicles per peak hour OR 6,000 vehicles per day	Criteria 3: average delay per vehicle greater than 30sec during peak hour	Criteria 4: Interim for traffic signals	Results
Early Drive & Salisbury Drive	2 collisions – Criteria NOT met	247 peak hour, 2,730 – Criteria NOT met	Below 30sec – Criteria NOT met	No plans for traffic signals – Criteria NOT met	All-way stop NOT warranted

Appendix B

Pedestrian Device Assessments

Pedestrian device assessment (Traffic Controls at Pedestrian Crossing, 2004)

Salisbury Dr & back lane (east of Conn Ave):

1. Lanes Priority Points:

	L =	2	lanes	= number of lanes.
	LANF =	0.0	points	= (L-2) x 3.6 to a max of 15 points, urban x-section only.
2. Media Points:	an Priority	y		
	MEDF =	6.0	points	indicating there is no physical median here.
3. Speed Points:	d Priority			
	S =	50	kph	= speed limit or 85th percentile speed.
	SPDF =	6.7	points	= (S-30) / 3 to a maximum of 10 points.
4. Pedea Location	strian Pro 1:	tection		
	D =	325	m	 distance from study location to nearest protected crosswalk.
	LOCF =	9.4	points	= (D-200) / 13.3 to a maximum of 15 points.
5. Pede	strian/Veł	nicle Vol	ume Pric	ority Points:
	H =	5.0		= (hours) duration of counting period.
	Ps =	26.0		= total number of children, teenagers, seniors and/or impaired counted.
	Pa =	0.0		= total number of adults counted.
	Pw =	39.0		 weighted average of pedestrians crossing the main street.
	Pcm =	7.8		= weighted average hourly pedestrian volume crossing the main street.
	V =	193.0		= volume of traffic passing through the crossing(s).

= average hourly volume of traffic passing through the crossing(s).

VOLF = 0.6 points = Vam x Pcm / 500

6. Satisfaction of Installation Criteria:

38.6

SUMF = (LANF + MEDF + SPDF + LOCF + VOLF)

SUMF = 23 points

(P.A. Signal Warrant Points)

Vam =

The total of the warrant points is less than 100 indicating that a pedestrian actuated signal is NOT warranted.

Early Drive & Salisbury Drive:

1. Lanes Priority Points:

L =	2	lanes	= number of lanes.	
LANF =	0.0	points	= (L-2) x 3.6 to a max of 15 points,	urban x-section only

2. Median Priority Points:

MEDF = 3.0 points = indicating there is a physical median here.

3. Speed Priority Points:

S =	50	kph	= speed limit or 85th percentile speed.
SPDF =	6.7	points	= (S-30) / 3 to a maximum of 10 points.

4. Pedestrian Protection Location:

D =	270	m	= distance from study location to nearest protected crosswalk.
LOCF =	5.3	points	= (D-200) / 13.3 to a maximum of 15 points.

5. Pedestrian/Vehicle Volume Priority Points:

H =	5.0		= (hours) duration of counting period.
Ps =	59.0		 total number of children, teenagers, seniors and/or impaired counted.
Pa =	0.0		 total number of adults counted.
Pw =	88.5		 weighted average of pedestrians crossing the main street.
Pcm =	17.7		= weighted average hourly pedestrian volume crossing the main street.
V =	923.0		= volume of traffic passing through the crossing(s).
Vam =	184.6		= average hourly volume of traffic passing through the crossing(s).
VOLF =	6.5	points	= Vam x Pcm / 500

6. Satisfaction of Installation Criteria:

SUMF = (LANF + MEDF + SPDF + LOCF + VOLF)

SUMF = **21** points

(P.A. Signal Warrant Points)

The total of the warrant points is less than 100 indicating that a pedestrian actuated signal is NOT warranted.

Appendix C

Recommendation Review Matrix

Decision Matrix – Recommendations proposed at initial meeting

Item	Location	Recommended Improvement	Group 1	Group 2	Group 3	Group 4 Other	Decision
1	Taylor St & Arlington Ave	Major intersection review	simultaneous LT arrows on Arlington lights for east/west turns onto Taylor St	In favour BUT should be double red for northbound traffic when left turn green arrow is on; left turn arrow should be on to let one or two cars through rather than having a long queue of cars to activate it	Should be looked at		Carried. Comments noted for review.
2	Arlington Ave (south of Baldwin Cres)	Remove parking on southeast corner or Arlington Ave (approximately 7m)				let home owner know	Carried
3	Arlington Ave & Early Dr	Install median island and standard pedestrian crosswalk		In favour BUT should be on north crosswalk instead of south crosswalk & have curb extensions added			Standard crosswalk on both sides. Median island will be on north side.
4	Early Dr & Webb Cres	Install median island	good but snow piles will make road too narrow for Transit				Carried
5	Early Dr & Phillips Cres (west)	Install median island	good but snow piles will make road too narrow for Transit				Carried
6	Early Dr & Salisbury Dr	Install permanent curb extensions & median island	would rather see 4- way stop	Needs to be well marked	50/50 members not in favour; install 4- way stop; tree trimming		Rejected. Traffic volumes are higher on Early Dr therefore stop signs should face Salisbury Dr. Remove existing temporary traffic calming. Change direction of 2- way stop.
7	Early Dr & curve west of Salisbury Dr	Install "curve ahead" signs & chevrons				chevrons not needed	Carried
8	Salisbury Dr at curve west of Conn Ave	Install permanent median islands		Narrow median islands			Carried
9	Salisbury Dr west of lane leading to park	Install advanced warning sign for pedestrians				in favour as long as there's marked pedestrian crosswalks	Rejected. Install Pedestrian crosswalk at back lane.
10	Salisbury Dr east of lane leading to park	Install advanced warning sign for pedestrians					Rejected. Install Pedestrian crosswalk at back lane.
11	7th St & Arlington Ave (west leg)	Install 3-way stop			Not in favour	visibility issues (10m)	Rejected. All-way stop criteria not met due to proximity of traffic signals on 8 th St.
12	3rd St & Argyle Ave	Install 2-way stop					Carried
13	3rd St & Tucker Cres	Install 2-way stop					Carried
14	Back lanes - north of Taylor St	Install 20kph speed limit signs	close alley access from Taylor St	Speed humps instead			Carried. Traffic calming not recommended in back lanes.
15	Back lanes - west of Arlington Ave	Install one-way signs				not in favour; 20kph speed signs instead	Carried

Decision Matrix – Additional comments

Item	Location	Concern	Recommended Improvement	Decision
1	Arlington Avenue between Sparling Crescent & Clark Crescent (in front of St. Matthews School	Parents dropping off/picking up children; parking in crosswalks; blocking back lanes	Implement Drop-off / Pick-up zone. Parking enforcement for parking over crosswalks & undesignated zones.	Carried (based on discretion of school board).
2	Arlington Ave & Argyle Ave	Shortcutting in back lanes	Install 20kph speed limit signs	Add 20kph speed signs at entrances to back lanes west of Argyle Ave; shortcutting in the back lane near Arlington Ave & Taylor St will be addressed with installation of one-way signage
3	Early Drive school zone	Speeding	Extend west end of school zone to west side of Madden Ave	Rejected. Proposed traffic calming on Early Drive should reduce speed.