



# Britannia Community Centre Renewal Transportation Impact Assessment

Final Report

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Prepared for  
Urban Arts

Date  
June 18, 2018

Project No.  
04-18-0167



June 18, 2018  
04-18-0167

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Dear Jennifer:

**Re: Britannia Community Centre Renewal,  
Transportation Impact Assessment**

Bunt & Associates Engineering Ltd. (Bunt) has completed our Preliminary Transportation Impact Assessment for the proposed Master Plan renewal of the Britannia Community Services Centre developed by Urban Arts. Our Draft Report is provided herewith, it addresses the potential transportation impacts related to the proposed renewal and key issues that have risen from the planning process.

We look forward to our continued work on this exciting project.

Yours truly,  
**Bunt & Associates**



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Date: June 18, 2018  
Project No. 04-18-0167  
Status: Final

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## EXECUTIVE SUMMARY

Urban Arts Architecture has prepared a Master Plan for the City of Vancouver for the renewal of Britannia Community Services Centre (BCSC), located at 1661 Napier Street in Vancouver. The following summary summarizes our transportation analysis and results.

### *Existing Condition*

The site is currently operational with a range of community amenities and services such as an ice rink, a pool with a fitness centre, two gyms, a library, three Vancouver School Board schools as well as various multi-purpose rooms and social support facilities.

BCSC is currently accessed from various vehicle routes. The main vehicle entry point to its 175 space surface parking lot is accessed from Cotton Drive which is accessed from Venables Street. Other vehicle routes to BCSC include from McLean Drive to the west, Woodland Drive to the north as well as Parker Street, William Street and Venables Lane from Commercial Drive.

Existing condition analysis indicates the surrounding study area intersections currently operate within operational capacity thresholds during weekday PM and Saturday peak hour periods.

During the weekday PM peak hour 53 two-way trips (28 inbound and 25 outbound) were observed exiting or entering Cotton Drive to / from Venables Street and 84 trips (40 inbound and 44 outbound) were observed during the Saturday peak hour. The existing total site vehicle trip generation is estimated to be approximately 155 total two-way trips during the weekday PM peak hour (77 inbound and 78 outbound), and 174 total two way trips during the Saturday peak hour of adjacent street traffic (89 inbound and 97 outbound).

Substantially higher pedestrian volumes were observed on Commercial Drive (at Parker Street) over Venables Street (at Cotton Drive).

### *Post Renewal Condition*

The post-renewal BCSC site trips (based on the 9,848 m<sup>2</sup> to 27,470 m<sup>2</sup> change in community facility area, or a 2.8 factor) are 431 two way trips (213 inbound, 218 outbound) in the weekday PM peak hour, and 518 (247 inbound, 271 outbound) in the Saturday mid-day peak hour.

The post-renewal forecasted site trips are based off of the proposed parking supply increase. It is however noted that the proposed 410 parking spaces is likely well over the anticipated parking demand for the proposed Master Plan. This number of vehicle spaces is likely excessive even when adding the anticipated demand for the contemplated 300 residential units.

The renewal's proposed supply of 410 vehicle spaces may be excessive but it does provide a conservative scenario for traffic analysis. Further refinement of the proposed vehicle parking supply will be provided subsequent to this TIA report.

Traffic operations are anticipated to remain within threshold criteria with the additional traffic generated by the proposed renewal, therefore no mitigation is recommended to accommodate the proposed Master Plan.

Our analysis indicates the closure of Parker Street (between Commercial Lane and Commercial Drive) to vehicle traffic will have negligible impact to study area traffic operations.

The proposed Master Plan achieves or exceeds recommended set-backs along Commercial Lane. The Master Plan indicates space to accommodate a 2.5 m short-term parking lane and a minimum of 2.5 m wide sidewalk along its Commercial Lane frontage. This configuration is considered appropriate as it retains existing lane width for through traffic and eastside lane loading activity while providing ample width to address the comfort and safety of pedestrians.

To protect against external parking, the Master Plan may consider adding parking time restrictions to parking spaces in main parking lot. Other speciality parking spaces should also be considered such as high vehicle occupancy spaces, or family / parents with children spaces.

A more substantive parking demand analysis should be undertaken to better understand the anticipated vehicle parking demand of the BCSC Master Plan.

# 1. INTRODUCTION

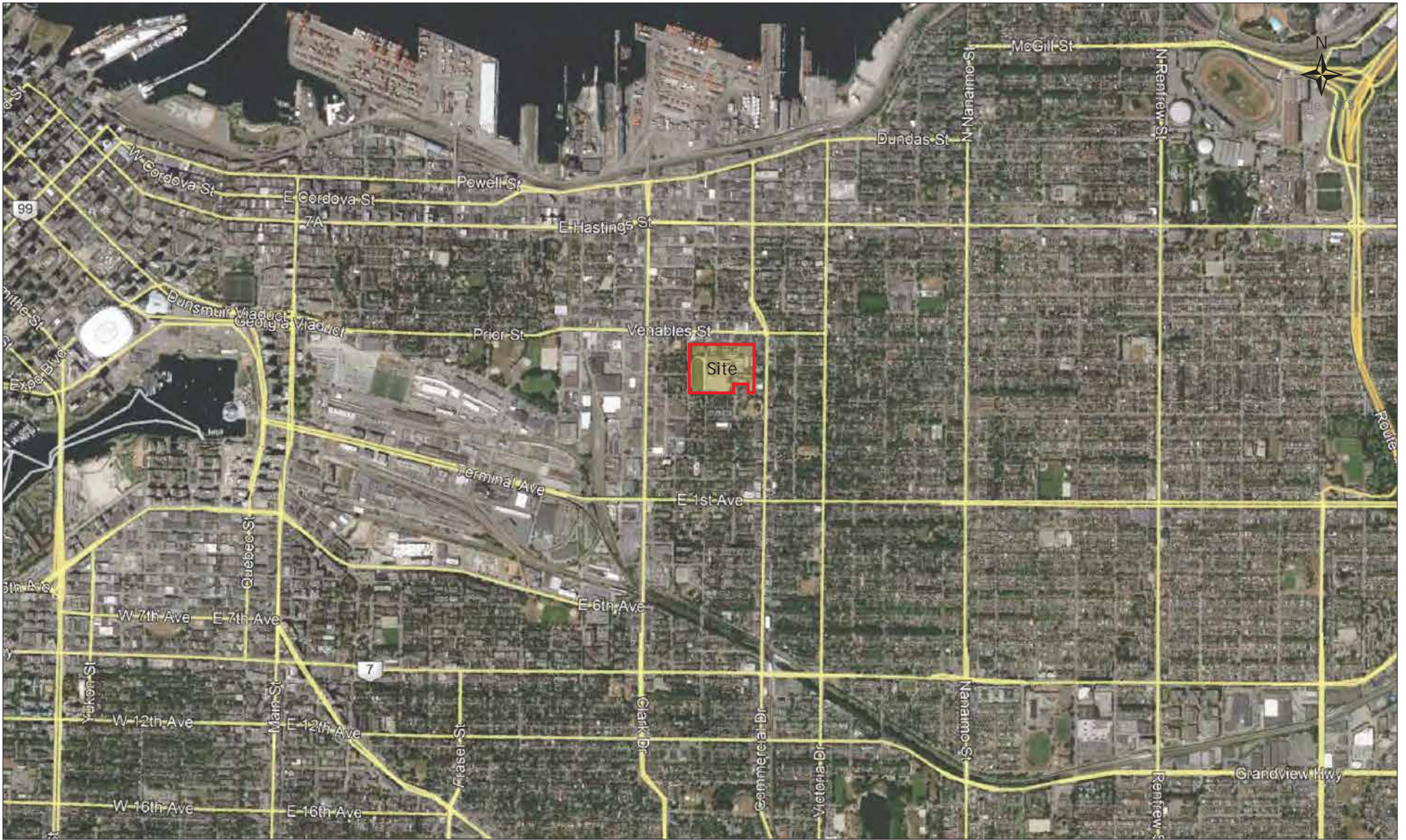
## 1.1 Study Purpose & Objectives

Commissioned by the City of Vancouver, Urban Arts Architecture evolved a Master Planning exercise for the renewal of Britannia Community Services Centre (BCSC). The address of the 18 acre site is 1661 Napier Street, Vancouver BC.

The Master Plan is a result of a comprehensive public engagement process. Bunt & Associates (Bunt) was retained to examine the transportation implications of the proposed renewal. Specifically, this study:

- Reviews the existing study area and existing BCSC weekday PM and Saturday mid-day peak hour traffic operations;
- Evaluates the transportation impacts of the proposed renewal on the adjacent road network including the proposed access alteration of converting Parker Street between the site and Commercial Drive into a pedestrian plaza with no vehicle access;
- Reviews school drop-off / pick-up activity around the BCSC site as well as its interaction with commercial loading activity in Commercial Lane.

The location of BCSC is illustrated in **Exhibit 1.1**.



## Exhibit 1.1 Site Location

Britannia Community Services Centre Renewal  
04-18-0167 May 2018



## 2. EXISTING CONDITIONS

### 2.1 Current Britannia Programs and Facilities

BCSC currently (2018) offers many facilities and programs. **Table 2.1** lists a wide range of available facilities.

**Table 2.1: Current BCSC Facilities & Programs**

CURRENT BRITANNIA FACILITIES
<ul style="list-style-type: none"> <li>• 25 meter indoor swimming pool;</li> <li>• Leisure pool;</li> <li>• Hot tub, steam room &amp; dry sauna;</li> <li>• Fitness centre;</li> <li>• Library;</li> <li>• Gym and combative mat room;</li> <li>• One 85' x 200' ice arena;</li> <li>• Community facilities/ meeting rooms (9,848 m<sup>2</sup>);</li> <li>• Britannia Preschool</li> <li>• Britannia Out of School Care</li> <li>• Eastside Family Place + Canucks Family Education Centre;</li> <li>• Britannia Elementary School plus gym (165 students);</li> <li>• Britannia Secondary School plus two gyms and an auditorium (750 students);</li> <li>• Streetfront Alternative School (22 students).</li> <li>• Outdoor playing fields, running oval basketball courts and five tennis courts.</li> </ul>

The locations of facilities listed above are illustrated in **Exhibit 2.1**.

#### 2.1.1 Hours of Operation

The pool and ice rink are open 6:30 AM to 9:55 PM Monday to Friday, 9 AM to 7:55 PM on Saturdays and 10 AM to 7:55 PM on Sundays.

Regular class times at the three on-site schools begin at 9:00 AM and end at 3:00 to 3:02 PM, Monday to Friday.

BCSC regular hours for other community programs and facilities are as follows:

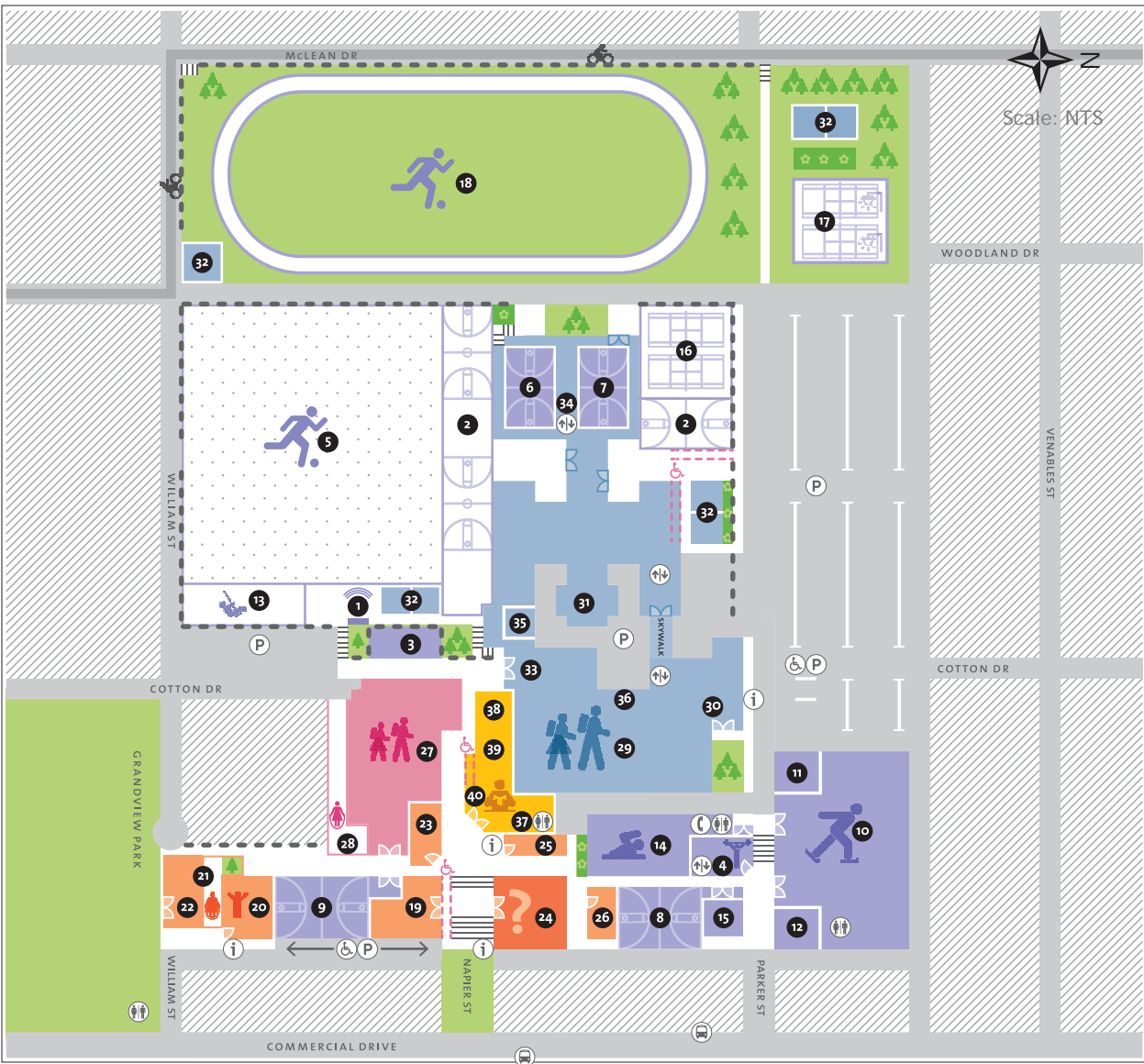
- Monday 8:30 AM to 9 PM
- Tuesday 8:30 AM to 9 PM
- Wednesday 8:30 AM to 9 PM
- Thursday 8:30 AM to 9 PM
- Friday 8:30 AM to 7 PM
- Saturday 9:00 AM to 5 PM
- Sunday 10:00 AM to 4 PM

### 2.1.2 Vehicle Parking

The existing BCSC site is serviced with a main surface parking lot with 174 parking spaces. This parking lot is accessed from Cotton Drive. These parking spaces are unregulated.

In addition, approximately 30 additional parking spaces are located in two small surface parking pools adjacent to the Secondary School. These parking lots are accessed from the main parking lot.

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**recreation**

- 1 Amphitheatre
- 2 Basketball Courts
- 3 Covered Play Area
- 4 Fitness Centre
- 5 Gravel Sports Field
- 6 Gym A
- 7 Gym B
- 8 Gym C
- 9 Gym D
- 10 Ice Rink
- 11 Ice Rink Activity Room (top flr)
- 12 Ice Rink Mezzanine (top flr)
- 13 Playground
- 14 Pool
- 15 Racquetball Court + Mat Room
- 16 Tennis Courts
- 17 Tennis Courts (lighted)
- 18 Track + Sports Field

**secondary school**

- 29 Britannia Secondary
- 30 Main Office/Entrance
- 31 Auditorium
- 32 Portables
- 33 South Entrance
- 34 Cafeteria
- 35 Canucks Family Education Centre (room 110)
- 36 Community Education

**library + learning**

- 37 VPL Britannia Branch (main flr)
- 38 Learning Resource Centre (basement)
- 39 Hastings Education Centre (top flr)
- 40 Art Gallery

**resources + services**

- 19 Al Mattison 55+ Centre
- 20 Child Care Centre
- 21 Eastside Family Place (ground flr)
- 22 Canucks Family Education Centre (top flr)
- 23 Family Activity Room
- 24 Info Centre
- 25 Pre-Teen Centre
- 26 Teen Centre

**elementary school**

- 27 Britannia Elementary
- 28 Outdoor Play Area

Fence	Wayfinding
Streets + Vehicle Access	Wheelchair Access
Bicycle Route	Stairs
Elevator	Residential + Commercial
Entrance	Gravel
Fields + Green Space	School Garden

**Exhibit 2.1  
Existing BCSC Facilities**

Britannia Community Services Centre Renewal  
04-18-0167 May 2018



## 2.2 Existing Transportation Network

### 2.2.1 Road Network

The site is located west of Commercial Drive and south of Venables Street in Vancouver. The study area, the adjacent road network and its laning configuration are illustrated in **Exhibit 2.2**.

**Venables Street** and **Commercial Drive** both have two travel lanes in each direction however parking is permitted in the curb side lanes of both roads. On Venables Street, north of BCSC, north edge and sporadic south edge curb side parking is permitted from 9 AM to 6 PM (Monday to Saturday).

On Commercial Drive curbside parking is permitted on both the east and west curb lanes with the exception of 7 AM to 9:30 AM Monday to Friday. Parking is permitted on Commercial Drive's curb lanes where there are also bus stops and loading zones, essentially resulting in one travel lane in each direction.

The main access to BCSC is from Cotton Drive which connects to Venables Street.

Directly north of the site is a laneway that runs east / west parallel to Venables Street. This east / west lane is referred to herein as **Venables Lane**. Venables Lane connects to Commercial Drive at its east terminus and to McLean Drive / Mosaic Bikeway at its west terminus.

In addition, there is a north / south laneway located west of Commercial Drive which is referred to herein as **Commercial Lane**. Commercial Lane's south end begins at William Street; it has a vehicular connection with Parker Street, then terminates at its north end with a t-intersection at Venables Lane. There is a pedestrian only link from Commercial Drive to Commercial Lane at Napier Street.

Both Venables Lane and Commercial Lane have approximate 20 foot (6 to 7 meter) widths with two-way vehicle travel. In addition both lanes provide rear commercial loading access to businesses that front Commercial Drive and Venables Street.

Bunt's Synchro model analysis discussed in Section 2.4 and Section 4 assumes curb side parking along both Venables Street and Commercial Drive.

### 2.2.2 Transit Network

The site is well serviced with transit. Route 20 travels along Commercial Drive connecting the site to SkyTrain and to downtown Vancouver. Route 22 travels along Clarke Drive (250m to west of site) also providing connections to SkyTrain and to downtown Vancouver. In addition to SkyTrain these transit routes also provide connections to the West Coast Express and the Sea Bus.

The surrounding transit network is presented in **Exhibit 2.3**.

### 2.2.3 Cycling & Pedestrian Networks

The site is located adjacent to Vancouver's Commercial Drive area. It is well connected to both walking and cycling networks.



The location is within a walking distance of nearly all typical amenities and services. The location receives a 98 out of 100 Walk Score, placing it in Walk Score's walker's paradise category. Walk Score is an on-line tool ([www.walkscore.com](http://www.walkscore.com)) that assesses the walkability of a location based on distances to a wide variety of amenities and services. BCSC is also near a residential area allowing students of the schools to walk or ride a bicycle to school.

Venables Street and Commercial Drive both have sidewalks with marked pedestrian crossings at major intersections.

Also, McLean Drive and William Street are classified as local street bikeways in Vancouver's cycling network. McLean Drive is part of the Mosaic Bikeway, which runs north-south from Adanac Street at the corner of Woodland Park to John Hendry Park via McLean Drive, Woodland Drive, and E 14<sup>th</sup> Avenue.

## 2.3 Data Collection

### 2.3.1 Traffic Data Collection Program

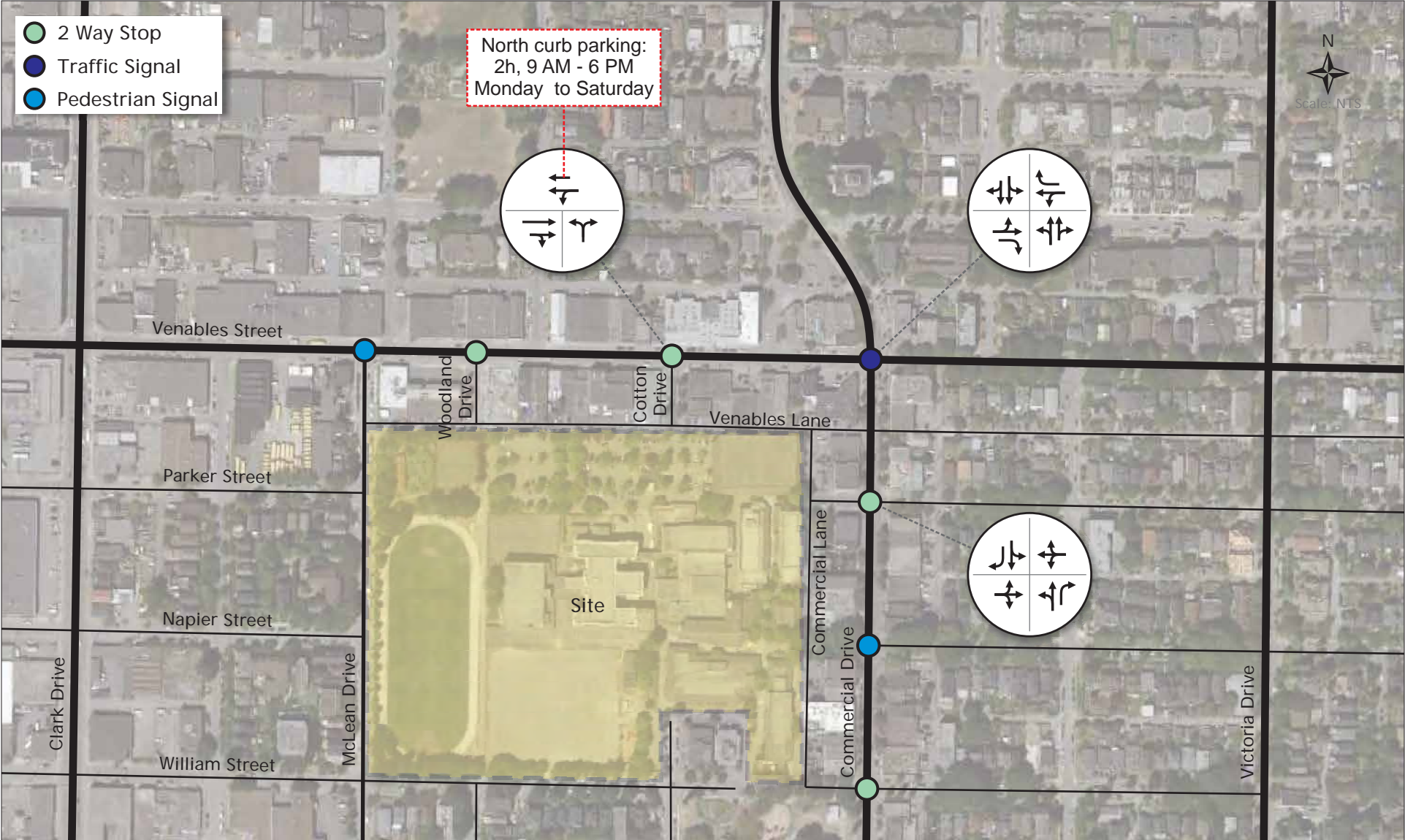
Traffic counts were conducted by Bunt on Saturday April 28 and Wednesday May 2, 2018. Bunt collected vehicle and pedestrian traffic volumes at the Cotton Drive and Venables Street intersection and the Parker Street and Commercial Drive intersection. These volumes were used to confirm and augment City of Vancouver datasets. Base volumes on Commercial Drive and Venables Street are based on City of Vancouver's 2013 1500 block Venables Street volumes and 1100 block Commercial Drive volumes. The weekday PM peak hour of adjacent street traffic was determined to be from 5:00 PM to 6:00 PM and on the Saturday it was from 1:00 PM to 2:00 PM.

Minor roadway connections to Venables Lane and Commercial Lane were observed and spot counts were conducted during the weekday PM and Saturday peak hour periods. Pedestrian volumes along Venables Street (south sidewalk) and Commercial Drive (west sidewalk) were also collected at Cotton Drive and at Parker Street.

Supplemental Commercial Lane traffic volumes were collected, and an assessment of through traffic versus pick-up / drop-off vehicles was conducted on May 24, 2018.

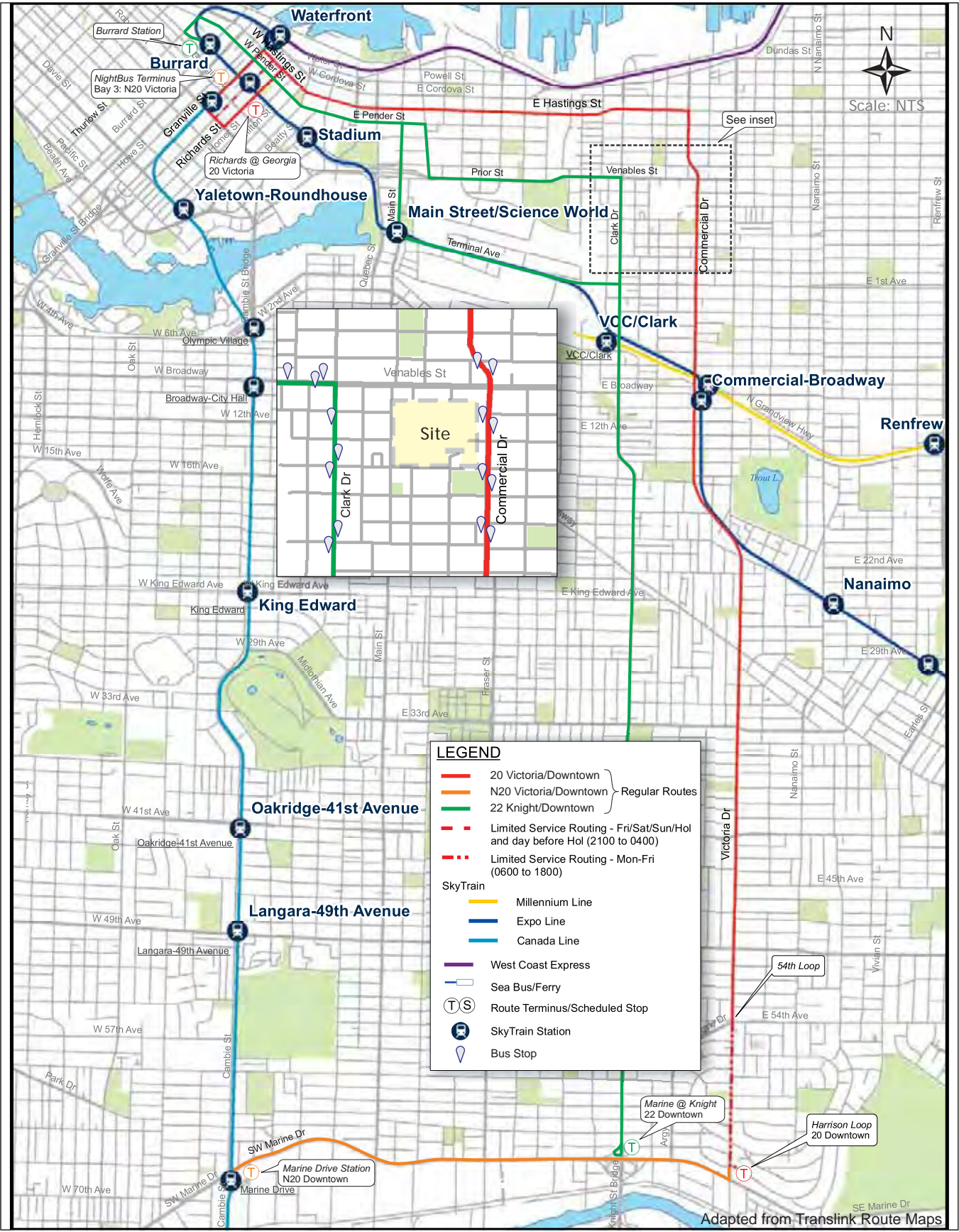
In addition, Bunt collected pick-up and drop-off activity as well as commercial loading activity in Commercial Lane during Wednesday May 16<sup>th</sup> 8:30 AM to 9:30 AM and 2:30 PM to 3:25 PM (these times coincide with the Elementary and Secondary schools start and finish times).

Study area Weekday PM and Saturday peak hour traffic volumes are presented in **Exhibit 2.4**.



## Exhibit 2.2 Existing Laning & Traffic Control (Study Area)

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## Exhibit 2.3 Transit Routes & Stops

Britannia Community Services Centre Renewal  
04-18-0167  
May 2018





Exhibit 2.4  
Existing Peak Hour Vehicle Traffic Volumes

### 2.3.2 Existing BCSC Site Vehicle Trips

There are various vehicle routes to the BCSC. Bunt observed volumes at the main Cotton Drive access (north edge of the site) as well as the Parker Street access (east side of the site). Spot counts were conducted at other minor access points to estimate an existing total site vehicle trip generation rate. Based on observations, site trips were calculated assuming 20% of McLean Drive trips are traveling to or from BCSC and 50% of the vehicle trips at Parker Street and William Street volumes are traveling to or from BCSC.

#### *Cotton Drive (North)*

During the weekday PM peak hour 53 two-way trips (28 inbound and 25 outbound) were observed exiting or entering Cotton Drive to / from Venables Street and 84 trips (40 inbound and 44 outbound) were observed during the Saturday peak hour.

#### *Parker Street (East)*

During the weekday PM peak hour 60 two-way trips (29 inbound and 31 outbound) were observed exiting or entering Parker Street to/ from Commercial Drive. Approximately half of these vehicles used this section of Parker Street as a drop-off or turn around spot rather than continuing onto Commercial Lane.

#### *Total Site Trips*

In addition to the observed vehicle volumes at Cotton Drive (north of site) and Parker Street (east of site) vehicles were also observed entering the site from other access points such as McLean Drive, Woodland Drive, and William Street. These volumes were estimated using five minute spot counts. Spot counts at these minor accessed points were observed in some cases to be less than five vehicles per peak hour therefore hourly turn movement volumes at these minor site accesses to the adjacent laneways were set at a minimal value of five vehicles per hour in our trip generation estimates and Synchro model.

The resulting existing total site vehicle trip generation is estimated to be approximately 155 total two-way trips during the weekday PM peak hour (77 inbound and 78 outbound), and 186 total two way trips during the Saturday peak hour of adjacent street traffic (89 inbound and 97 outbound).

### 2.3.3 Existing School Pick-up / Drop-off and Commercial Loading Activity

Bunt conducted a site visit to observe school pick-up / drop-off activity at various BCSC locations on Thursday May 17, 2018. The observed locations and observation notes are provided in **Exhibit 2.5**.

Key finding of the school pick-up / drop-off and commercial loading activity are:

- Substantial school drop-off and pick-up activity was observed south of the site with motorists using the publically available spaces along Cotton Drive (south of the site) and William Street (south and west of the site). Motorists were observed using these parking areas then walking their children to school or meeting them at the adjacent playground.

- Overall, the two school's pick-up and drop-off activity appeared dispersed. No traffic operational impacts or traffic blockages were observed.
- The Commercial Lane appeared to be the most congested area as it is used for accessing the elementary school as well as the secondary school. To compound the activity in this location a high number of pedestrians were also observed in the lane as well as commercial loading activity.

Supplemental observations of Commercial Lane during the afternoon of May 24, 2018 indicated:

- Approximately 25 northbound vehicles per peak hour (3PM to 4PM) were observed on Commercial Lane adjacent to Napier Street and 25 southbound vehicles. Most of this was during the first fifteen minutes due to school pick-up activity.
- Of these vehicles traveling along Commercial Lane it was estimated that 80% stopped to pick-up or drop-off a passenger or park at the rear of the Commercial Street fronting businesses on the east side of the Lane. The remaining 20% were through vehicles that traveled through the lane without stopping. This results in a very small number of vehicles using the lane as a through fare (between William Street and Venables Lane).

#### 2.3.4 Existing Pedestrian Activity Observations

Substantially higher pedestrian volumes were observed on Commercial Drive (at Parker Street) over Venables Street (at Cotton Drive).

During the Saturday peak hour period approximately 20 pedestrians were observed crossing the south leg of the Venables Street and Cotton Drive intersection's south leg versus approximately 162 pedestrians crossing the west leg of the Parker Street and Commercial Drive intersection. This lends support for focused vehicle access off of Venables Street as less interaction with pedestrian movements can be anticipated.

Venables Lane and Commercial Lane do not have pedestrian amenities such as sidewalks or pedestrian refuge areas.

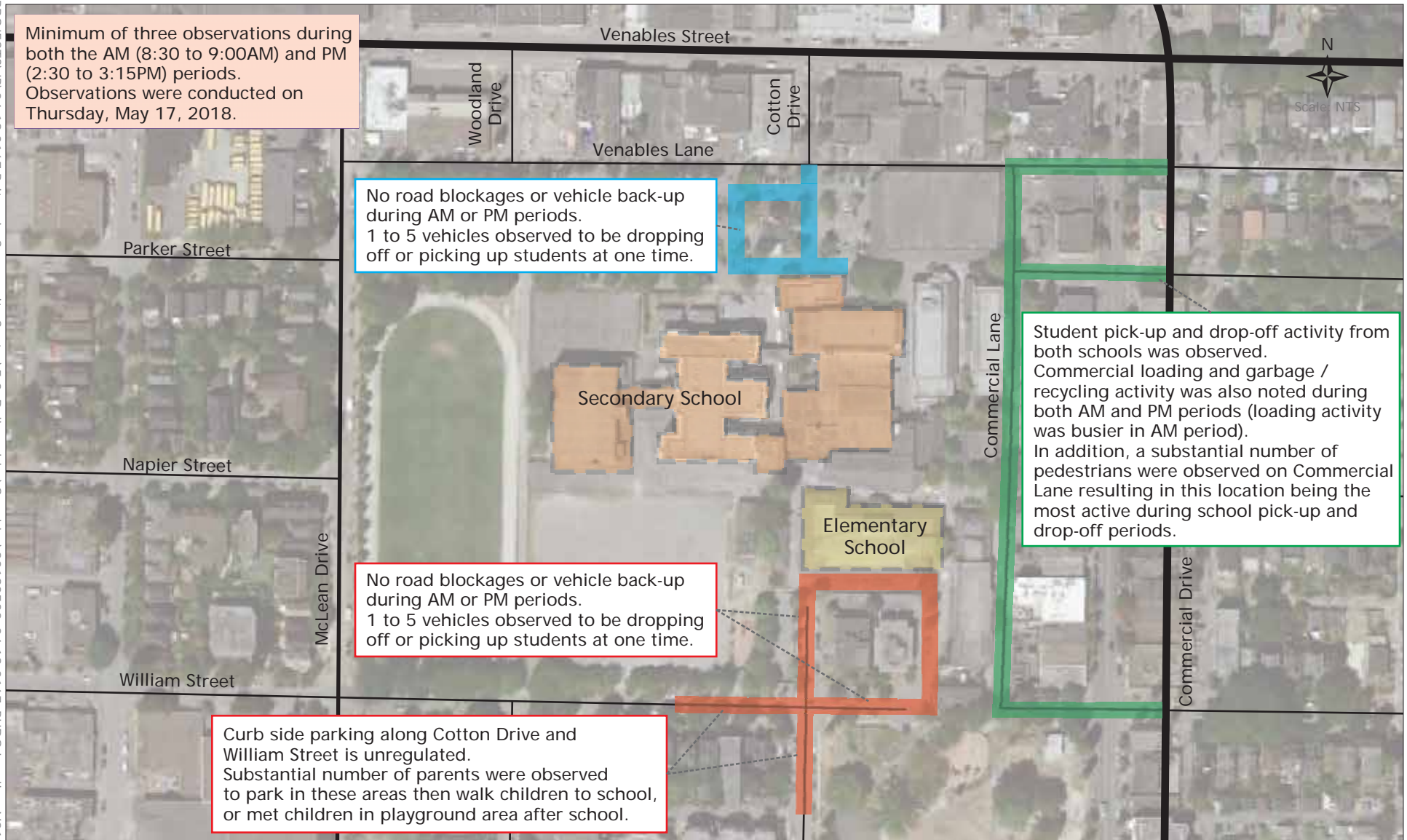
During our site visits the Commercial Lane was observed to have a significant amount of pedestrian activity, these pedestrians must mix with two-way vehicle travel as well as commercial loading activity for the adjacent businesses along Commercial Drive.

#### 2.3.5 Existing On-Site Parking Activity Observations

As previously noted, the existing site's main parking pool is a 174 space parking lot. The primary access to the parking lot is from Cotton Drive. The parking lot also connects through Venables Lane which provides a connection to Commercial Lane and other minor north / south roads to the west.

During our traffic counts the main parking lot was observed to be approximately 85% full. During our weekday AM school drop-off observations the parking lot was approximately 50% full.

It was noted that the parking lot may be used by vehicles not destined for this site (parking at BCSC then walking elsewhere).



## Exhibit 2.5 Existing School Pick-up / Drop-off and Commercial Loading Activity



## 2.4 Existing Traffic Operations

### 2.4.1 Performance Thresholds

The existing operations of study area intersections and access points were assessed using the methods outlined in the 2000 Highway Capacity Manual (HCM), using the Synchro 9 analysis software. The traffic operations were assessed using the performance measures of Level of Service (LOS) and volume-to-capacity (V/C) ratio.

The LOS rating is based on average vehicle delay and ranges from "A" to "F" based on the quality of operation at the intersection. LOS "A" represents optimal, minimal delay conditions while a LOS "F" represents an over-capacity condition with considerable congestion and/or delay. Delay is calculated in seconds and is based on the average intersection delay per vehicle.

**Table 2.2** below summarizes the LOS thresholds for the five Levels of Service, for both signalized and unsignalized intersections.

**Table 2.2: Intersection Level of Service Thresholds**

LEVEL OF SERVICE	AVERAGE CONTROL DELAY PER VEHICLE (SECONDS)	
	SIGNALIZED	UNSIGNALIZED
A	≤10	≤10
B	>10 and ≤20	>10 and ≤15
C	>20 and ≤35	>15 and ≤25
D	>35 and ≤55	>25 and ≤35
E	>55 and ≤80	>35 and ≤50
F	>80	>50

Source: Highway Capacity Manual

The volume to capacity (V/C) ratio of an intersection represents ratio between the demand volume and the available capacity. A V/C ratio less than 0.85 indicates that there is sufficient capacity to accommodate demands and generally represents reasonable traffic conditions in suburban settings. A V/C value between 0.85 and 0.95 indicates an intersection is approaching practical capacity; a V/C ratio over 0.95 indicates that traffic demands are close to exceeding the available capacity, resulting in saturated conditions. A V/C ratio over 1.0 indicates a very congested intersection where drivers may have to wait through several signal cycles. In downtown and town centre contexts, during peak demand periods, V/C ratios over 0.90 and even 1.0 are common.

The performance thresholds that were used to trigger consideration of roadway or traffic control improvements to support roadway or traffic control improvements employed in this study are listed below:

Signalized Intersections:

- Overall intersection Level of Service = LOS D or better;
- Overall intersection V/C ratio = 0.85 or less;

- Individual movement Level of Service = LOS E or better; and,
- Individual movement V/C ratio = 0.90 or less.

#### Unsignalized Intersections:

- Individual movement Level of Service = LOS E or better, unless the volume is very low in which case LOS F is acceptable.

In interpreting of the analysis results, note that the HCM methodology reports performance differently for various types of intersection traffic control. In this report, the performance reporting convention is as follows:

- For signalized intersections: HCM 2000 output for overall LOS and V/C as well as individual movement LOS and V/C is reported; and,
- For unsignalized two-way stop controlled intersections: HCM 2000 LOS and V/C output is reported just for individual lanes as the HCM methodology does not report overall performance.

The performance reporting conventions noted above have been consistently applied throughout this document.

#### 2.4.2 Operational Analysis Assumptions

Of note, the signal timing plans for the existing and future analyses were estimated using 60 second cycle lengths. All other Synchro defaults were used.

#### 2.4.3 Existing Operational Analysis Results

As shown in **Exhibits 2.6** and **2.7** all intersections currently operate within described operational thresholds in both the weekday PM and Saturday peak hour periods.



## Exhibit 2.6 Existing Weekday PM Peak Hour Operations



## Exhibit 2.7 Existing Saturday Peak Hour Operations

### 3. PROPOSED RENEWAL

Urban Arts' proposed Master Plan BCSC renewal is summarized in **Table 3.1** in terms of proposed alterations or additions to existing facilities. The proposed renewal site plan is shown in **Exhibit 3.1**.

**Table 3.1: Proposed BCSC Renewal Alterations**

FACILITIES	ALTERATION
25 meter indoor pool plus aquatic facilities	20% increase in visitors anticipated due to new, larger facility
Fitness Centre	Four time increase in size
Library	Approximately same size, amenities added. 20% increase in visitors due to new facility
Gym	Approximate double gym area
One ice rink (500 seats)	Same size
Community facilities 9,848 m <sup>2</sup>	Increase to 27,470 m <sup>2</sup>
Preschool Care	Same size
Out of School Care	Same size
Eastside Family Place + Canuck Family Education	Same size
Elementary School - 165 students	Same size
Secondary School - 750 students	Same size
Streetfront School - 22 students	Same size
Outdoor playing fields, running oval, basketball courts, and five tennis courts	Same size
Social Housing (currently none on-site)	Maximum of 300 residential units
Non-Profit Office hub (currently not on-site)	Part of Community Facility space
Daycare (currently none on-site)	Part of Community Facility space

As shown in Table 3.1 the key alterations are the growth of community facilities (9,848 m<sup>2</sup> to 27,470 m<sup>2</sup>).

Future vehicle trip growth was calculated using the factor of 2.8, which is the proposed increase in community facility area and the proportional increase of on-site parking (to the proposed 410 parking spaces). This method (using a multiplier of 2.8 over existing volumes) of forecasting vehicle trip generation for the Master Plan is considered to be conservative because major BCSC vehicle trip generators other than the community facilities, such as the schools and ice rink are not growing near this applied rate or no change in capacity is anticipated at all.

In addition, the community facilities area increase is not anticipated to result in a proportional increase in community facility visitors but rather will offer an improved user experience. The community facilities user demographic is also anticipated to draw from a more local population, which is more likely to walk or cycle to the site, rather than being a wider regional draw such as a new pool where a higher vehicle mode split can be anticipated.

Bunt estimates the proposed Master Plan with inclusion of 300 residential units may be in the range of 250 to 410 total vehicle spaces depending on factors such as the tenure and size of the residential units

and the breadth of Transportation Demand Management initiatives that target all BCSC facilities and user groups, including residents.

The traffic generation of the site will be impacted by the final to-be determined on-site parking supply.

In this report's analysis we have established our site generation forecasts based on the proposed on-site parking space supply of 410 vehicle spaces.

### 3.1 Vehicle Parking

Vehicle parking demand rates for the residential units are anticipated to be in the range of 0.3 to 0.5 vehicle spaces per unit which would equate to 90 to 150 parking spaces. A more accurate assessment of resident parking demand is unknown at this time as it is dependent upon resident unit type, unit size and TDM initiatives.

A more substantive parking demand analysis should be undertaken to better understand the anticipated vehicle parking demand of the renewed BCSC Master Plan.

All parking spaces are to be provided within an underground parking facility. The parkade is proposed to be located under the new BCSC Venables Lane fronting buildings and hence would be accessed similarly as the current BCSC parking spaces.

To protect against non site destined parking, the Master Plan may consider adding parking time restrictions to parking spaces in main parking lot. Other speciality spaces should also be considered such as high vehicle occupancy spaces, or family / parents with children spaces. The Master Plan will provide short term parking spaces exclusive for daycare drop-off and pick-up activity.

### 3.2 Access

The only alteration to BCSC vehicle access is the closure of vehicle access on Parker Street (between Commercial Drive and Commercial Lane). The impacts of this proposed change are examined in Section 4.

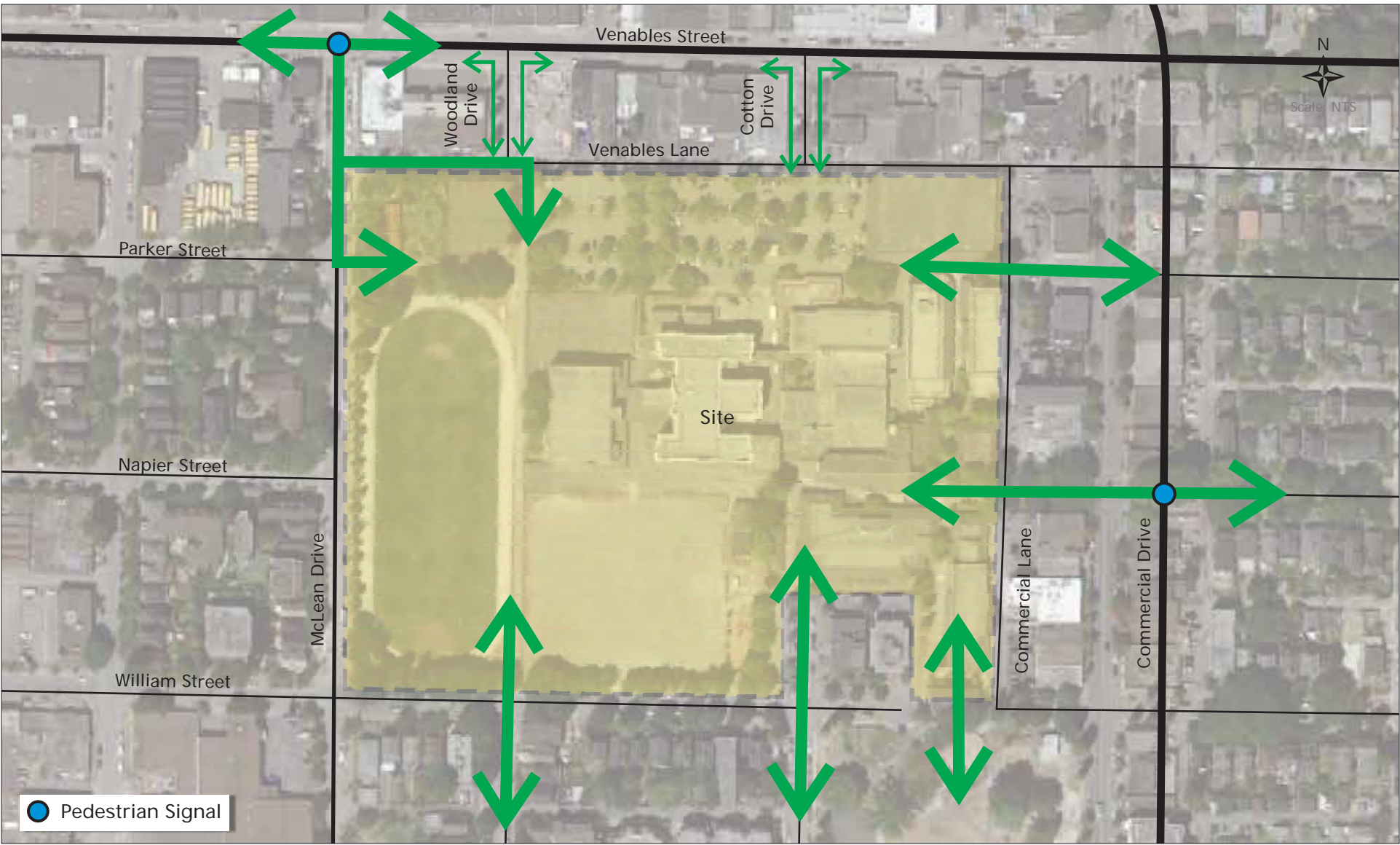
Pedestrian access to the renewed site is illustrated in **Exhibit 3.2**. The Master Plan adds both external pedestrian routes with the proposed conversion of Parker Street away from vehicle access and also increases internal pedestrian routes the site.



Exhibit 3.1  
Renewal Site Plan



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### Exhibit 3.2 Proposed Pedestrian Connections

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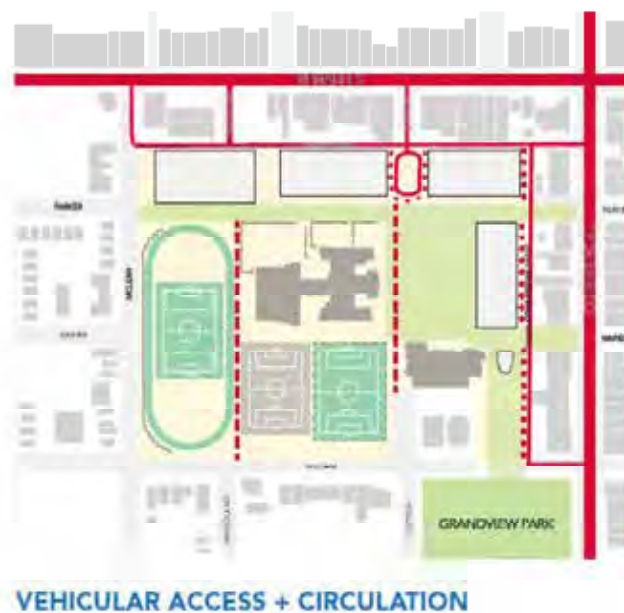


## 4. FUTURE TRAFFIC CONDITIONS

### 4.1 Traffic Forecasts

For report brevity, operation exhibits are presented within the body of this report; volume exhibits are not presented within the report body but can be viewed in **Appendix A**. The traffic analysis was based on the vehicle access and circulation plan as provided within the Master Plan (shown below in **Figure 4.1**).

**Figure 1: Vehicular Access + Circulation**



#### 4.1.1 Background Traffic Growth

Background traffic represents the traffic that would be present on the road network if the site did not redevelop. Future background scenarios are forecasted by adding a growth factor to existing traffic volumes.

Background traffic growth was calculated in consultation with historical City of Vancouver volumes from 1500 block Venables Street and 1100 block Commercial Drive as well as intersection counts at the Venables Street and Commercial Drive intersection.

From 2005 to 2013 Commercial Drive traffic volumes appear to have grown by approximately 1.5 to 2% per year. For the purposes of calculating 2030 background volumes at 1.5% annual linear growth rate was applied.

From 2006 to 2013 Venables Street traffic volumes have decreased by approximately 15%. As such a 0% growth rate was applied to Venables Street traffic.

The resulting 2030 Background weekday PM and Saturday traffic operations are shown in **Exhibits 4.1** and **4.2** respectively.

These background operations can be compared with total (with development) operations to determine the net impact of the proposed BCSC renewal.



## Exhibit 4.1 Background 2030 Weekday PM Peak Hour Operations



## Exhibit 4.2 Background 2030 Saturday Peak Hour Operations

#### 4.1.2 Site Traffic

##### *Trip Generation*

As an assumption for the purpose of this analysis, the anticipated traffic increase to the site is tied to the proposed parking increase from the existing 175 parking spaces to the proposed 410 parking spaces. The 175 parking spaces to 410 parking spaces change was based on the proposed increase of community facility space (from 9,848 m<sup>2</sup> to 27,470 m<sup>2</sup>). This approach for determining the future parking supply is however considered to be very conservative as many BCSC entities are not growing at a similar rate and in fact some entities such as the schools are not anticipated to grow at all. While the new pool will likely generate more visitors, visitation is not anticipated to growth threefold.

The post-renewal BCSC site trips (based on the 9,848 m<sup>2</sup> to 27,470 m<sup>2</sup> change in community facility area, or a 2.8 factor) are 431 two way trips (213 inbound, 218 outbound) in the weekday PM peak hour, and 518 (247 inbound, 271 outbound) in the Saturday mid-day peak hour.

A detailed parking demand analysis will follow which may result in a lower recommended parking supply and corresponding lower trip generation estimates. To counter this potential factor, the renewal program may also in the future include up to 300 residential housing units.

##### *Trip Distribution & Assignment*

Trips generated by the proposed renewal were assigned to the study area using present distributions. The distributed site generated vehicle trips are illustrated in **Exhibit 4.3**. These volumes assume the same access and road configuration as the existing condition. The Master Plan however indicates the closure of Parker Street (east of BCSC); the impact of closing Parker Street (between BCSC and Commercial Drive) is discussed in Section 4.1.3.

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## Exhibit 4.3 Renewal Site Traffic Volumes

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### 4.1.3 Future Total Traffic Operations

Future total traffic operations examine the background future volumes with the addition of the proposed renewal's site trips. **Exhibits 4.4 and 4.5** illustrate the forecasted Total Weekday PM and Saturday peak hour traffic operations for the 2030 horizon year, respectively. The Total 2030 scenario can be compared with the Background 2030 operations (i.e. without the proposed renewal) to understand the net impact of the proposed renewal.

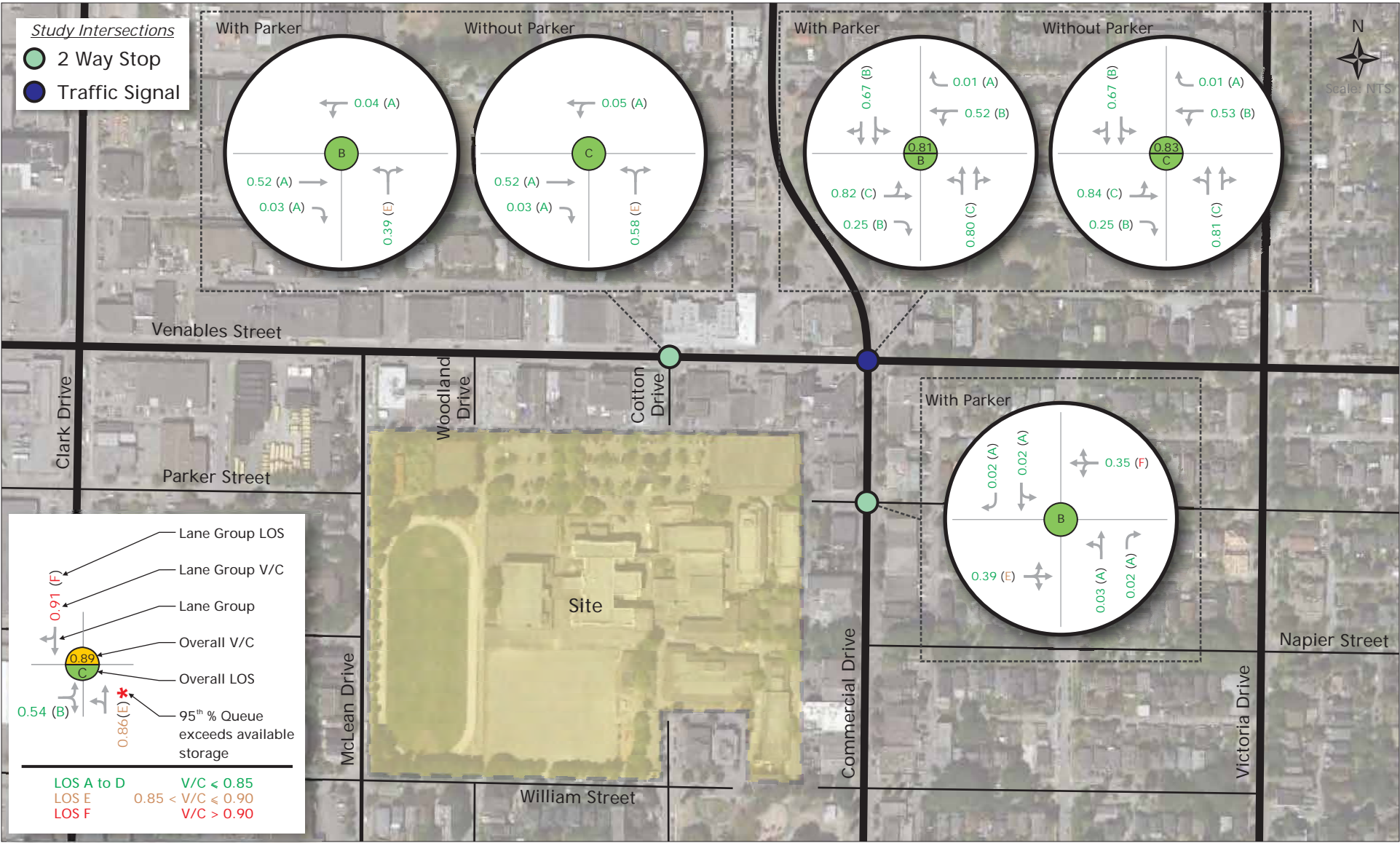
Exhibits 4.4 and 4.5 also present the future 2030 total traffic operations with Parker Street open as is the current condition and with Parker Street closed (between Commercial Drive and BCSC) as is proposed in the Master Plan.

The traffic model with Parker Street closed to vehicle traffic scenario assumes the reassignment of Parker Street volumes at approximately:

- 30% to the Venables Street & Cotton Drive access;
- 30% to William Street; and,
- 40% to the retained connection from Commercial Drive to the Venables Lane which is located north of the Parker Street alignment. Operations at this lane are not discussed in previous traffic model scenarios due to its observed low volumes.

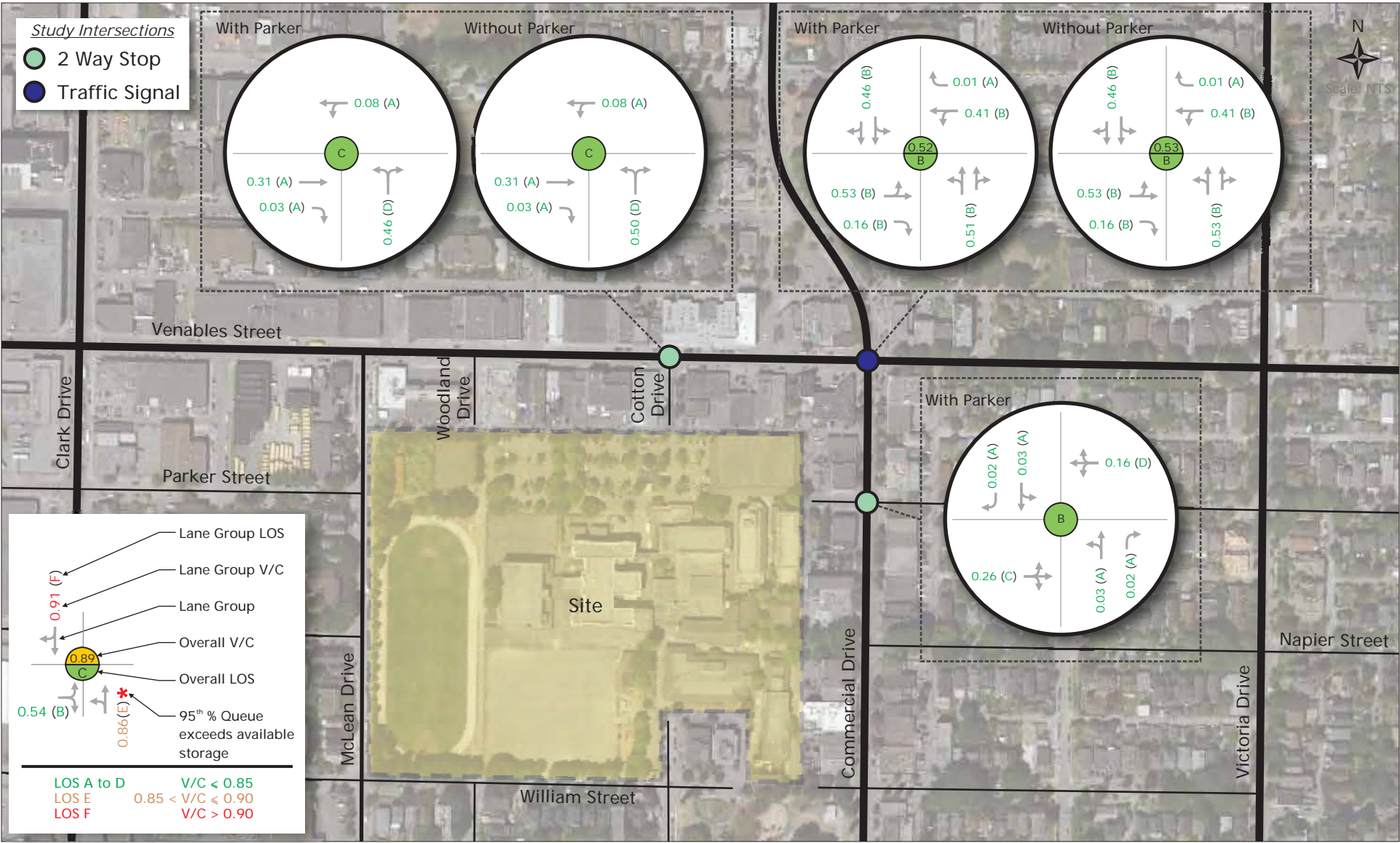
As illustrated in Exhibits 4.4 and 4.5, all intersections in the Total 2030 scenarios operate within described operational thresholds in both the weekday PM and Saturday peak hour periods.

Exhibit 4.4 and 4.5 illustrate that the proposed closure of Parker Street (between Commercial Drive and BCSC) does not have significant impact to area traffic operations.



## Exhibit 4.4 Total 2030 Weekday PM Peak Hour Operations





## Exhibit 4.5 Total 2030 Saturday Peak Hour Operations

#### 4.1.4 Summary of Traffic Impacts & Recommended Mitigations

No traffic operational issues are anticipated from the proposed Master Plan BCSC renewal.

The Master Plan's proposed Parker Street closure is anticipated to have negligible traffic impacts and is therefore supported due to its pedestrian realm improvements. Specifically, the closure of Parker Street is supported due to the following considerations:

- Venables Lane will retain a northern site Commercial Drive connection;
- Cotton Drive and Venables Street intersection has capacity for future build out, with reassigned Parker trips;
- Higher pedestrian volumes on Commercial Drive crossing the Commercial Drive & Parker Street intersection's west leg over the Venables Street & Cotton Drive intersection's south leg; and,
- Proximity to new community centre entry locations.

The traffic increase was tied to proposed parking increase where parking may be oversupplied, Bunt recommends Urban Arts explore options to reduce on-site vehicle parking supplies including the adoption of a robust Transportation Demand Management (TDM) plan.

Consideration may be given to converting the time periods of Venables Street's north curb adjacent to Cotton Drive from its current 9 AM to 6 PM two hour parking regulation to 9:30 AM to 5 PM. Although the eastbound traffic is not shown to have significant delays, allowing westbound vehicles on Venables Street to pass a vehicle waiting to turn left onto Cotton Drive across substantial eastbound Venables Street traffic will assist westbound vehicles on Venables Street.

## 5. SITE PLAN DESIGN REVIEW

### 5.1 Site Access Design

The site access design mirrors the site's present access with the exception of converting Parker Street east of Commercial Drive into a no vehicle access pedestrian plaza. As discussed in Section 4, Bunt's analysis indicates the removal of vehicle access on Parker Street will not have significant impact to traffic operations.

### 5.2 Student Pick-up Drop-off

The Master Plan includes formalized pick-up / drop-off spaces along Commercial Lane.

### 5.3 Loading

Commercial Lane & Venables Lane intersection will be designed to accommodate applicable loading vehicles.

The Master Plan will improve the pedestrian realm along Commercial Lane with the addition of a sidewalk or pedestrian area that is segregated from vehicles and loading activity.

The proposed Master Plan achieves or exceeds recommended set-backs along Commercial Lane. The Master Plan indicates space to accommodate a 2.5 m short-term parking lane and a minimum of 2.5 m wide sidewalk along its Commercial Lane frontage. This proposed width allows for various cross section opportunities that can increase pedestrian safety while retaining lane width for through traffic and eastside lane loading activity.

### 5.4 Parking Supply

The current vehicle parking supply is equivalent to the community facilities square meter area increase of 9,848 m<sup>2</sup> to 27,470 m<sup>2</sup>.

This growth is likely excessive when applied to the full BCSC site due to the following factors:

- Existing parking appears to also be used by external vehicles;
- Various BCSC components are not growing by the same factor (280%) such as the ice rink, the pool and the three schools;
- The community facilities are anticipated to draw from a more local demographic compared to the other uses such as the ice rink and the pool. The more local user demographic is anticipated to have a lower vehicle mode split.

A more substantive parking demand analysis should be undertaken to better understand the anticipated vehicle parking demand of the renewed BCSC Master Plan.

## 6. CONCLUSIONS & RECOMMENDATIONS

### 6.1 Conclusions

During the weekday PM peak hour 53 two-way trips (28 inbound and 25 outbound) were observed exiting or entering Cotton Drive to/ from Venables Street and 84 trips (40 inbound and 44 outbound) were observed during the Saturday peak hour.

Substantially higher pedestrian volumes were observed on Commercial Drive (at Parker Street) over Venables Street (at Cotton Drive).

The resulting existing total site vehicle trip generation is estimated to be approximately 155 total two-way trips during the weekday PM peak hour (77 inbound and 78 outbound), and 186 total two way trips during the Saturday peak hour of adjacent street traffic (89 inbound and 97 outbound).

The post-renewal BCSC site trips (based on the 9,848 m<sup>2</sup> to 27,470 m<sup>2</sup> change in community facility area, or a 2.8 factor) are 431 two way trips (213 inbound, 218 outbound) in the weekday PM peak hour, and 518 (247 inbound, 271 outbound) in the Saturday mid-day peak hour.

No traffic operational issues are anticipated from the proposed Master Plan BCSC renewal.

The Master Plan's proposed Parker Street closure is anticipated to have negligible traffic impacts and is therefore supported due to its pedestrian realm improvements. Specifically, Bunt supports the Master Plan's closure of Parker Street (between Commercial Drive and Commercial Lane) due to the following considerations:

- Venables Lane will retain a northern site Commercial Drive connection;
- The Cotton Drive and Venables Street intersection has capacity for future build out, with reassigned Parker trips; and,
- Higher pedestrian volumes crossing Commercial Drive & Parker Street intersection's west leg over Venables Street & Cotton Drive intersection's south leg.

Key findings of the school pick-up / drop-off and commercial loading activity are:

- Substantial school drop-off and pick-up activity was observed south of the site with motorists using the publically available spaces along Cotton Drive (south of the site) and William Street (west of the site). Motorists were observed using these parking areas then walking their children to school or meeting them at the adjacent playground;
- Overall, the two school's pick-up and drop-off activity appeared dispersed. No traffic operational impacts or traffic blockages were observed; and,
- Commercial Lane appeared to be the most congested area as it is used for accessing the elementary school as well as the secondary school. To compound the activity in this location a high number of pedestrians were also observed in the lane as well as commercial loading activity.

The Commercial Lane & Venables Lane intersection will be designed to accommodate applicable loading vehicles.

The Master Plan will improve the pedestrian realm along Commercial Lane with the addition of a sidewalk or pedestrian area that is segregated from vehicles and loading activity.

The proposed parking supply, which was determined by using the growth factor of the community facilities is likely excessive due to the following factors:

- Existing parking appears to also be used by external vehicles;
- Various BCSC components are not growing by the same factor (280%) such as the ice rink, the pool and the three schools; and,
- The community facilities are anticipated to draw from a more local demographic compared to the other uses such as the ice rink and the pool. The more local user demographic is anticipated to have a lower vehicle mode split.

The proposed Master Plan achieves or exceeds recommended set-backs along Commercial Lane. The Master Plan indicates space to accommodate a 2.5 m short-term parking lane and a minimum of 2.5 m wide sidewalk along its Commercial Lane frontage. This configuration is considered appropriate as it retains existing lane width for through traffic and eastside lane loading activity.

## 6.2 Recommendations

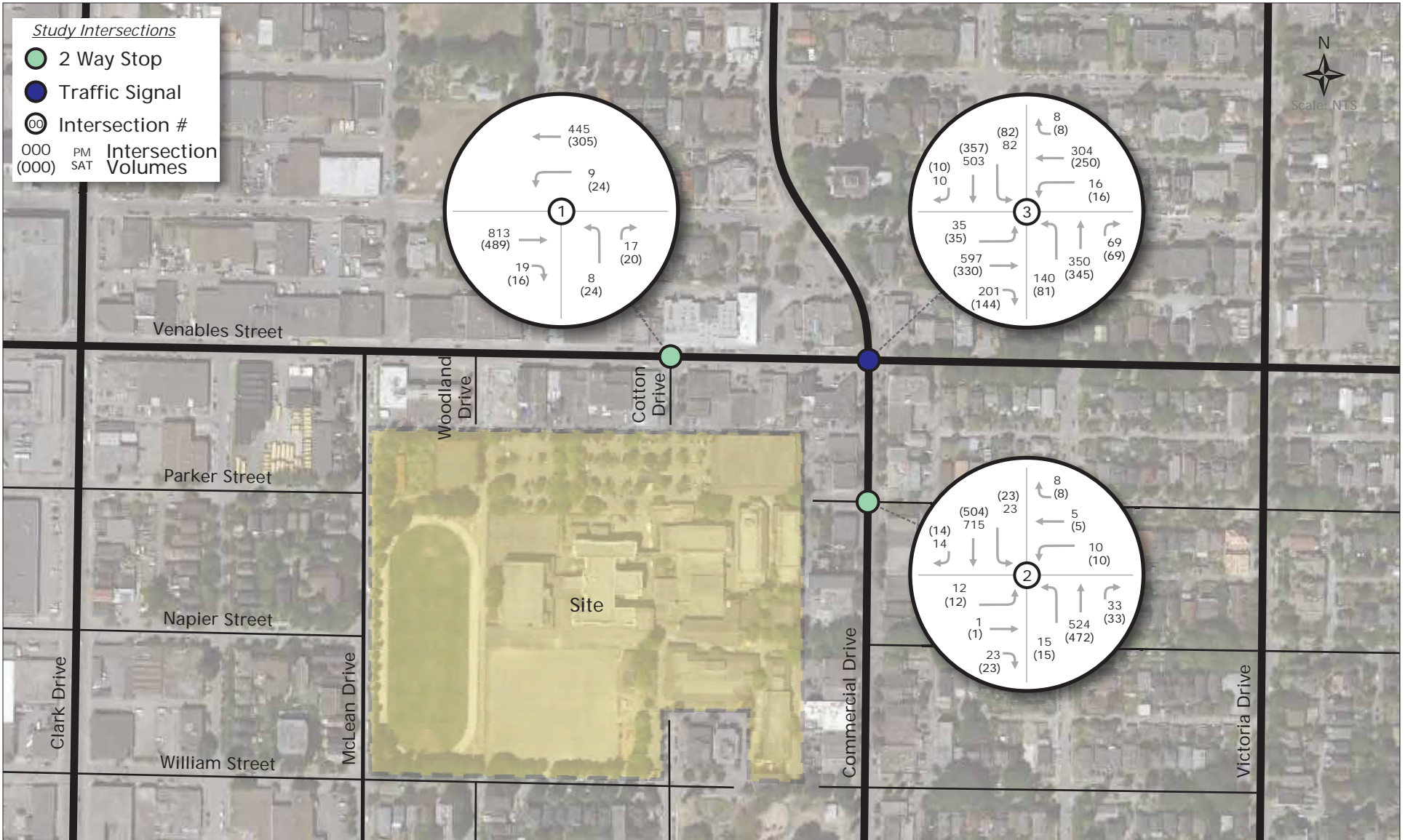
Consideration may be given to converting the time periods of Venables Street's north curb adjacent to Cotton Drive from its current 9 AM to 6 PM two hour parking regulation to 9:30 AM to 5 PM. Although the eastbound traffic is not shown to have significant delays, allowing westbound vehicles on Venables Street to pass a vehicle waiting to turn left onto Cotton Drive across substantial eastbound Venables Street traffic will assist westbound vehicles on Venables Street.

To protect against external parking, the Master Plan may consider adding parking time restrictions to parking spaces in main parking lot. Other speciality spaces should also be considered such as high vehicle occupancy spaces, or family / parents with children spaces.

A more substantive parking demand analysis should be undertaken to better understand the anticipated vehicle parking demand of the renewed BCSC Master Plan. Bunt recommends Urban Arts Architecture explore options to reduce on-site vehicle parking supplies including the adoption of a robust Transportation Demand Management (TDM) plan.

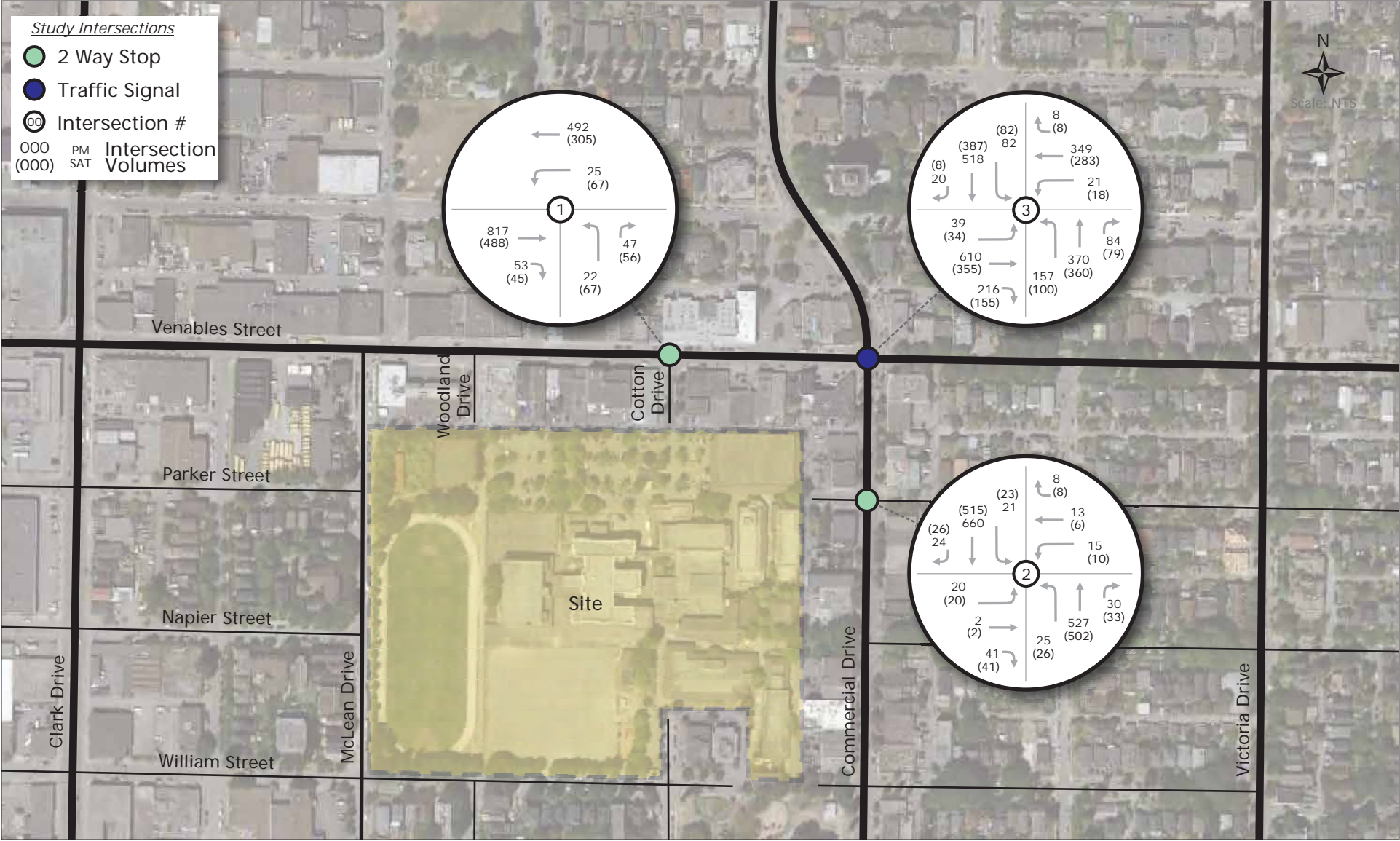
# APPENDIX A

## Traffic Forecast Volumes



## Exhibit A.1 Background 2030 Traffic Forecasts

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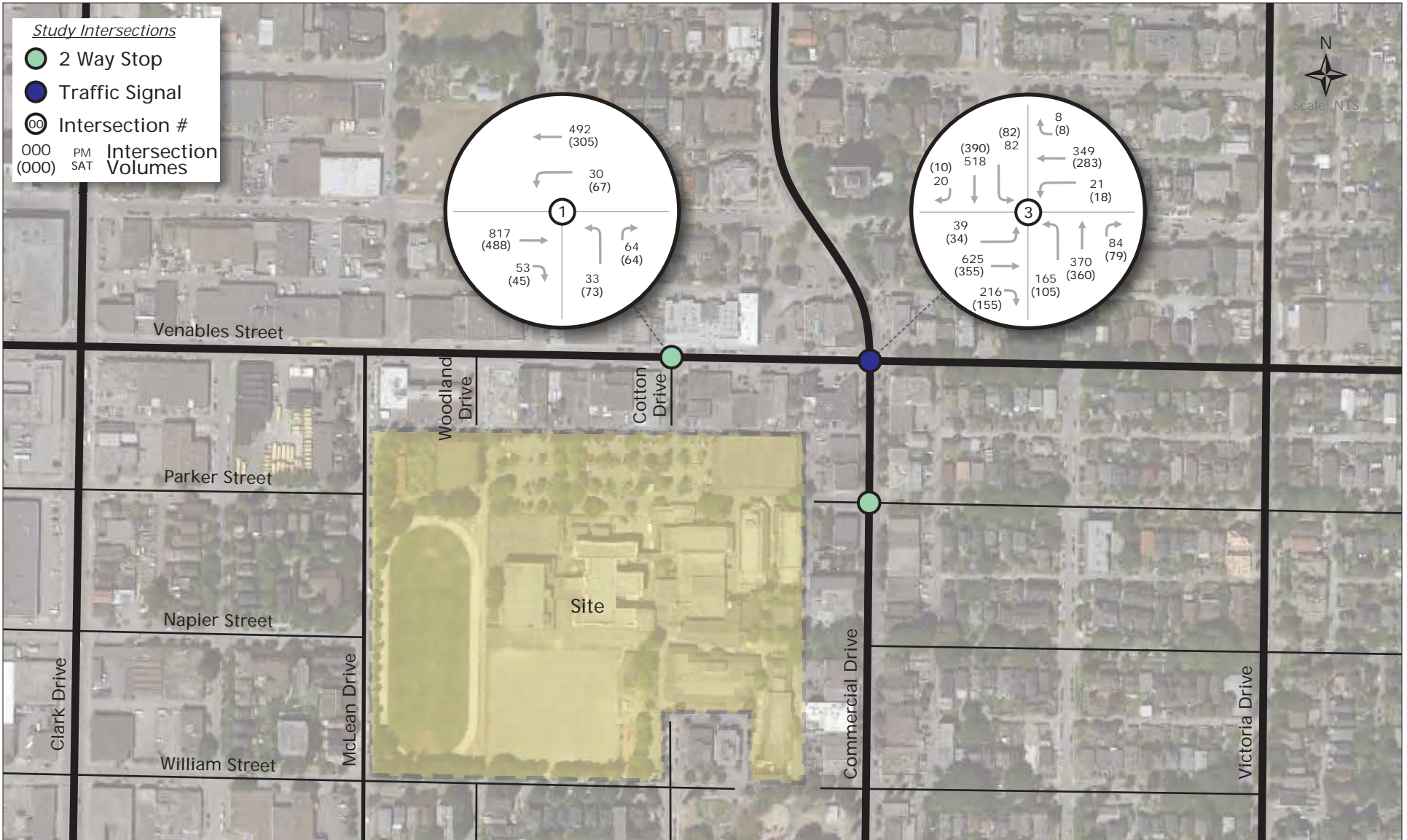


## Exhibit A.2 Total 2030 Traffic Forecasts With Parker

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## Exhibit A.3 Total 2030 Traffic Forecasts Without Parker

