

February 10, 2011  
4778.01

Mr. Bob Heaslip  
Development Planning Strategies  
#1103 – 170 West 1<sup>st</sup> Street  
North Vancouver, BC V7M 3P2

Dear Bob,

**Re: Kiwanis Garden Village Phase II Redevelopment, West Vancouver  
Traffic Study – Draft Report**

The Kiwanis Garden Village, a senior's housing development, is proposing to redevelop a portion of their site to construct two new buildings that will replace several smaller and older buildings. This letter report summarizes the findings of our traffic and parking study.

## 1. BACKGROUND

The proposed redevelopment of the Kiwanis Garden Village site will involve the construction of two new buildings, and the demolition of five existing older buildings. A sixth building has already been demolished, and two newer existing buildings (Kiwanis Manor and Kiwanis Court) will remain. The new development will close off the existing laneway that runs through the site, currently connecting Haywood Avenue between 21<sup>st</sup> and 22<sup>nd</sup> Streets. Both access points at 21<sup>st</sup> and 22<sup>nd</sup> will remain, but will be dead-end driveways at site parking and loading areas. Following the redevelopment, the Kiwanis site will have access from 21<sup>st</sup> Street, and parking for the two new buildings will be provided for in underground parkades. The proposed site layout is illustrated in **Exhibit 1.1** at the end of this report.

The purpose of this study is to assess the impact to traffic volumes and traffic operations in the area, following redevelopment of the site. The report will also comment on the parking and loading supply and anticipated demands, as well as pick-up/drop-off and site circulation.

### 1.1 Proposed Development

The proposed redevelopment will include the construction of two new buildings with independent living seniors' residential units. A total of 140 new units will be constructed; the east building with 64 units, and the west building with 76 units. Demolition of the five existing buildings, will remove 51 independent living units from the site. A sixth building has already been demolished, that included 12 units.

The net gain of residential units on the site will be 77 units considering all 6 demolished buildings, and the net gain of units will be 89 units if only considering the 5 buildings remaining to be demolished. Since our traffic counts took place after demolition of the sixth building, for the purpose of this study we will assume a net gain of 89 units. We have conservatively assumed that both buildings will be constructed at the same time and ready for occupancy as early as the summer months of 2013. **Table 1** summarizes the number of units to be constructed and demolished, and the anticipated schedule.

**Table 1 – Anticipated Schedule of Construction/Demolition**

Independent Living Seniors' Residential Units	# Units	Date of Construction/Demolition
New Units to be Constructed – East Building	64	2012 - 2013
New Units to be Constructed – West Building	76	2012 - 2013
Existing Units to be Demolished – 5 Buildings	51	2012
Existing Units already Demolished – 1 Building	12	Completed
Net Gain – Considering 5 Buildings to be Demolished	89	--
Net Gain – Considering 6 Demolished Buildings	77	--

## 2. TRAFFIC IMPACT ANALYSIS

### 2.1 Data Collection

Bunt & Associates staff conducted traffic counts during the PM peak hour on Wednesday January 19, 2011 at the four study area intersections: 21<sup>st</sup> Street at both Gordon and Haywood, and 22<sup>nd</sup> Street at both Gordon and Haywood. The existing 2011 traffic volumes are illustrated in **Exhibit 2.1**.

### 2.2 Site Traffic Generation

During the PM peak hour, the site is currently generating about 20 trips (9 In, 11 Out) at the 21<sup>st</sup>/Haywood access and about 10 trips (4 In, 6 Out) at the 22<sup>nd</sup>/Haywood access. Following the redevelopment, the site is expected to generate additional trips at the 21<sup>st</sup>/Haywood intersection, and it has been conservatively assumed that all existing trips at the 22<sup>nd</sup> Street access will be shifted to the 21<sup>st</sup> Street access.

The estimate of newly generated site traffic, following the redevelopment, is summarized in **Table 2**. We have assumed industry standard Institute of Transportation Engineers (ITE) trip generation rates for this estimate, and as shown, during the PM peak hour, it is expected that the site will generate about 15 new trips (9 In, 6 Out). This is based on the assumption of a net gain of 85 units, and assumes that the existing traffic generated by the site will remain unchanged.

**Table 2 – Site Traffic Generation – PM Peak Hour**

Use	Size	Trip Rate	PM Peak Hour Vehicle Trips		
			In	Out	Total
Independent Living Seniors Residential Units	85 units *	0.16 **	9	6	15

Notes: \* This is the net new number of units, considering demolition of the existing five buildings.

\*\* The trip rate is based on ITE Land Use Code 252: Senior Adult Housing, Attached.

The site traffic was assumed to be distributed to the adjacent road network as per the observed splits at the existing driveways, which were roughly 35% to/from the north and 65% to/from the south. The estimated net new site generated traffic volumes are illustrated in **Exhibit 2.2**.

### 2.3 Traffic Volume Projections

The traffic volume forecasts look at an opening day scenario, assumed to be in 2013, and a future horizon year ten years after opening, or 2023. Although it is our experience that the traffic volumes in West Vancouver have remained relatively unchanged over the past five years or so, we have conservatively assumed a modest background growth of 1% per year to account for any new development in the immediate area. Although a number of larger developments are expected in West Vancouver over the next few years, the majority of added traffic would be expected on major east-west routes and north-south routes other than 22<sup>nd</sup> or 21<sup>st</sup>.

To estimate the future traffic volumes following completion of the proposed redevelopment, the 1% background growth rate was applied to volumes on 21<sup>st</sup> and 22<sup>nd</sup> Streets and those on Gordon and Haywood Avenues to increase these volumes to the projected 2013 and 2023 levels. All the site traffic counted at both the 21<sup>st</sup> and 22<sup>nd</sup> access points was reassigned to 21<sup>st</sup> Street. The estimated net new site generated traffic volumes were then added to the background volumes to determine the future total traffic volumes. **Exhibits 2.3 & 2.4** illustrate the projected traffic volumes.

## 2.4 Traffic Impact Analysis

The capacity analysis was carried out using Synchro Software version 6, and the results are summarized in the tables provided in the following section. The SimTraffic traffic simulation program was also used to view traffic operations on the area streets as a further measure of traffic performance. The summary tables report the calculated Volume to Capacity (V/C) ratio and a corresponding delay-based traffic Level of Service (LOS) indicator ranging from ideal LOS A conditions with minimal delay through to LOS E 'near capacity' conditions and LOS F 'over-saturated' conditions when drivers may have to wait through several signal cycles to perform their desired movements through the intersection. The 95<sup>th</sup> percentile predicted average queue length for each lane group is also summarized, measured in metres.

In our summary tables, we have assumed the following performance thresholds:

- V/C = 0.85 or greater for the overall intersection operations (as per District WVan);
- V/C = 0.90 or greater for individual movements (as per District WVan);
- Levels of Service at E or F;
- 95<sup>th</sup> percentile queue lengths that are longer than the available storage length.

All situations where these performance thresholds were exceeded have been identified by red text in the summary tables.

### 2.4.1 PM Peak Hour Capacity Analysis

The PM peak hour analysis is summarized in **Tables 3, 4 & 5**. All three intersections are minor street stop-controlled intersections with one lane in each direction.

**Table 3 – PM Peak Hour Capacity Analysis – Gordon @ 21<sup>st</sup> Street**

Movement	Weekday PM Peak Hour											
	Background 2013			Total 2013			Background 2023			Total 2023		
	V/C	LOS	Q	V/C	LOS	Q	V/C	LOS	Q	V/C	LOS	Q
EBTLR	0.24	B	7	0.24	B	7	0.29	C	9	0.29	C	9
WBTLR	0.00	A	<1	0.00	A	<1	0.00	A	<1	0.00	A	<1
NBTLR	0.05	A	1	0.05	A	1	0.05	A	2	0.06	A	2
SBTLR	0.00	A	0	0.00	A	0	0.00	A	0	0.00	A	0

**Notes:** NBLR – Northbound Left & Right Lane, WBTL – Westbound Thru & Left Lane, Etc.  
 V/C – Volume to Capacity Ratio where 1.00 represents at capacity.  
 LOS – Level of Service Indicator, A-best/min delay, to E/F-worst/saturated conditions.  
 Q – 95<sup>th</sup> percentile vehicle queue length in metres, where one vehicle is about 6-7 metres.

The analysis shows that the Gordon/21<sup>st</sup> intersection is expected to operate at well under capacity conditions during the weekday PM peak hour period, with no queuing or operational concerns. The impact of the redeveloped facility is expected to have a minimal effect on intersection operations.

**Table 4 – PM Peak Hour Capacity Analysis – Gordon @ 22<sup>nd</sup> Street**

Movement	Weekday PM Peak Hour											
	Background 2013			Total 2013			Background 2023			Total 2023		
	V/C	LOS	Q	V/C	LOS	Q	V/C	LOS	Q	V/C	LOS	Q
WBLR	0.11	B	3	0.11	B	3	0.13	B	3	0.13	B	3
NBTR	0.10	--	0	0.10	--	0	0.11	--	0	0.11	--	0
SBTL	0.07	A	2	0.07	A	2	0.08	A	2	0.08	A	2

**Notes:** NBLR – Northbound Left & Right Lane, WBTL – Westbound Thru & Left Lane, Etc.  
 V/C – Volume to Capacity Ratio where 1.00 represents at capacity.  
 LOS – Level of Service Indicator, A-best/min delay, to E/F-worst/saturated conditions.  
 Q – 95<sup>th</sup> percentile vehicle queue length in metres, where one vehicle is about 6-7 metres.

The analysis shows that the Gordon/22<sup>nd</sup> intersection is also expected to operate at well under capacity conditions during the weekday PM peak hour period, with no queuing or operational concerns. The impact of the redeveloped facility is expected to have a minimal effect on operations at this intersection.

**Table 5 – PM Peak Hour Capacity Analysis – Haywood @ 21<sup>st</sup> Street (Kiwanis Site Access)**

Movement	Weekday PM Peak Hour											
	Background 2013			Total 2013			Background 2023			Total 2023		
	V/C	LOS	Q	V/C	LOS	Q	V/C	LOS	Q	V/C	LOS	Q
EBTLR	0.04	B	1	0.05	B	1	0.04	B	1	0.06	B	1
WBTLR	0.00	B	<1	0.00	B	<1	0.00	B	<1	0.00	B	<1
NBTLR	0.01	A	<1	0.01	A	<1	0.01	A	<1	0.01	A	<1
SBTLR	0.00	A	<1	0.00	A	<1	0.00	A	<1	0.00	A	<1

**Notes:** NBLR – Northbound Left & Right Lane, WBTL – Westbound Thru & Left Lane, Etc.

V/C – Volume to Capacity Ratio where 1.00 represents at capacity.

LOS – Level of Service Indicator, A-best/min delay, to E/F-worst/saturated conditions.

Q – 95<sup>th</sup> percentile vehicle queue length in metres, where one vehicle is about 6-7 metres.

The analysis shows that the Site Access/Haywood/21<sup>st</sup> intersection is also expected to operate at well under capacity conditions during the weekday PM peak hour period, with no queuing or operational concerns. The impact of the redeveloped facility is expected to have a minimal effect on operations at this intersection.

**2.4.2 Closure of the East-West Laneway through the Site**

The laneway running through the site, connecting Haywood Avenue between 21<sup>st</sup> and 22<sup>nd</sup> Streets is not currently used by vehicles as a through street. This laneway has been very effectively traffic calmed, with a series of 8 speed humps, as well as a narrowing at the centre of the site that restricts the laneway width down to only one lane.

Closure of this connection is not anticipated to cause any significant impact to site traffic or local traffic. The existing volumes show that the majority of site traffic currently uses the 21<sup>st</sup> Street access today. The most notable impact will be that vehicles entering the site for pick-up/drop-off and loading will be required to turnaround before exiting. Vehicle turnaround will be provided for through the hammerhead loading area and/or empty parking spaces, and will be discussed in more detail in Section 4.

**2.4.3 Sight Lines at 21<sup>st</sup> Street Access**

The 21<sup>st</sup> Street site access slopes down from 21<sup>st</sup> Street, and the angle at which it meets 21<sup>st</sup> Street creates some sight line challenges for outbound vehicles. Stopping at the curb line, sight lines to the north are quite limited, extending about 55 metres when no vehicles are parked on-street on the north side of the

access. The Transportation Association of Canada (TAC) recommends a minimum 60 metre stopping sight distance on roads with 50km/h speed limits.

It is recommended to provide corner bulges on the west side of 21<sup>st</sup> Street on both sides of the site access. This will reduce the on-street parking supply, but will prevent vehicles parking too close to the driveway and restricting driver's visibility. Corner bulges will also allow vehicles to pull forward further than the curb line, significantly improving sight lines to the north, so that visibility is extended up to the next intersection or about 110 metres, and well beyond the minimum TAC stopping sight distance requirements.

### 3. PARKING ANALYSIS

This section of the report will examine the project parking requirements, in terms of both the District's bylaw requirements, as well as the anticipated actual demand.

#### 3.1 Proposed Parking Supply

The proposed parking supply following the redevelopment is summarized in Table 6.

**Table 6 – Proposed Parking Supply**

Building	# Units	Underground Parking	Surface Parking	Total	Rate
Kiwanis Court – <i>Existing</i>	86	42	--	42	0.49
Kiwanis Manor – <i>Existing</i>	76	30	3	33	0.43
East Building – <i>New</i>	64	24	5	29	0.45
West Building – <i>New</i>	76	25	--	25	0.35
<b>Total</b>	<b>298</b>	<b>121</b>	<b>8</b>	<b>129</b>	<b>0.43</b>

As shown, the proposed parking supply is a total of 54 spaces for 140 units, or a rate of 0.40 stalls per dwelling unit for the new portion of the development. The proposed parking supply for the entire site is a total of 129 spaces for 298 units, or a rate of 0.43 stalls per dwelling unit.

### 3.2 Bylaw Parking Requirement

The required parking provision for the new portion of the development, as per the District of West Vancouver zoning bylaw, is summarized in **Table 7**.

**Table 7 – Bylaw Parking Requirements**

Building	# Units	Bylaw Rate	# Spaces Required	# Spaces Provided
East Building	64			
West Building	76			
Total	140	1 space per 3 dwelling units	47	54

As shown, the proposed parking supply of 54 spaces will meet and exceed the bylaw minimum requirement of 47 spaces.

### 3.3 Anticipated Parking Demands

Bunt & Associates staff have conducted numerous parking demand studies for seniors' housing projects within the GVRD. Our database of parking demand data, reports typical parking demand rates in the range of 0.32 to 0.33 spaces per unit. These rates are also comparable to reported rates in the ITE Parking Generation Manual, as well as the District's bylaw parking supply rate requirement.

The proposed facility will provide an average parking supply rate of 0.40 spaces per unit for the two new buildings, and an overall parking supply rate for the entire site of 0.43 spaces per unit. The proposed supply is anticipated to more than accommodate the projected parking demands.

## 4. ON-SITE OPERATIONS

This section will assess the on-site operations related to loading, shuttle buses, visitor parking and pick-up/drop-off.

### 4.1 Data Collection

Bunt & Associates staff conducted a day long count on Wednesday January 19, 2011 (from 8am to 6pm) to document the use of all surface parking stalls, loading, bus parking, visitor parking and staff parking spaces off the rear laneway of the site. The peak observed parking demand occurred at 11:30am, as summarized in **Table 8**.



Table 8 – Peak Observed On-Site Surface Parking/Loading Demand

Parking Type	Supply	Demand
Numbered Resident Stalls (plus 10 Unmarked Stalls)	45	23
Visitor Parking	7	7
Shuttle Bus Parking	1	1
Loading	2	0
Drop-Off	2	1
Staff Parking	1	1
<b>Total</b>	<b>63</b>	<b>37</b>

The following summarizes the findings of the parking/loading survey data:

- The resident and unmarked parking stalls were consistently occupied over the course of the day, with a number of available spaces throughout the day, and it was observed that several vehicles left and returned to the site in the afternoon, but otherwise there was little change in demand;
- The visitor parking was used throughout the day, and the demand varied from 1 to 7 vehicles, with every stall occupied for roughly a half hour period at lunch time, and otherwise there were available spots throughout the day;
- There were a total of 9 shuttle buses observed on the site over the course of the day, each with an average duration of stay of about 5 minutes, and only ever one bus on the site at any one time;
- Minimal activity was observed at the loading bays, and the maximum demand was 1 vehicle;
- The drop-off spaces were used on and off through-out the day, with a maximum demand of 1 vehicle at any one time;
- The staff parking spaces were consistently used throughout the day, with peak occupancy between 10am-1pm.

## 4.2 Loading Operations

The development will have one loading bay, accessed from the 21<sup>st</sup> Street driveway. The loading bay will be located in a hammerhead turnaround area, designed to accommodate fire truck turnaround as well as vehicle turnaround on the site.

The loading bay will primarily be used by small trucks making deliveries to the commercial kitchen in the Kiwanis Manor building, and very little to no loading will be required at the two new buildings. As per the findings of our counts, it is expected that one loading bay will be sufficient for the site.

## 4.3 Pick-Up / Drop-Off, Visitor & Staff Parking

The development will provide two pick-up/drop-off lay-bys on the site. Each will be designed to accommodate a small shuttle bus, as per the type that typically visits the site. In addition a loading/stopping zone is currently in place on Gordon Avenue in front of the Kiwanis Court building, which can also be used for shuttle bus pick-up/drop-off stopping.

It is expected that the on-site pick-up/drop-off spaces will also be used by passenger vehicles, when picking-up or dropping-off someone and not entering the building. Visitors requiring to walk into the buildings would be expected to make use of the visitor parking spaces. The site will provide a total of 8 surface parking stalls for visitors, as well as 4 spaces in the underground parkade of the new East building. In addition to the on-site visitor parking, there is unrestricted on-street parking along the west side of 21<sup>st</sup> Street next to the site. There is also on-street parking on the south side of Gordon Avenue, from which the north end of the Kiwanis site can be reached by pedestrian connections through the site right from Gordon Avenue.

Staff parking will be provided in the parkade of the new West building. Two spaces will be provided.

## 4.4 Site Circulation

A site circulation review was completed using the AutoTurn software package, assuming a design vehicle modeled on the District of West Vancouver's Fire Department Ladder Truck #41, one of their largest trucks with ladder and bucket. **Exhibit 4.1** illustrates the turning radius required for a Fire Truck to turnaround on-site. As shown, the hammerhead facility as designed will be able to accommodate fire truck turnaround. Smaller delivery vehicles and shuttle buses will also be accommodated in this turnaround area.

## 5. CONCLUSIONS & RECOMMENDATIONS

### 5.1 Conclusions

The proposed development is expected to generate about 15 new trips (9 In, 6 Out) during the PM Peak Hour, based on the assumption of a net gain of 89 residential units.

The impact of the projected new site generated traffic is not anticipated to result in any operational concerns at the study area intersections or site accesses, and no off-site improvements are warranted.

The site is expected to operate efficiently with the one site access on 21<sup>st</sup> Street, and no significant impacts are anticipated related to closure of site access to 22<sup>nd</sup> Street.

The proposed parking supply will result in a parking rate of 0.40 spaces per unit for the new portion of the development and an overall parking supply rate of 0.43 for the entire site. This is anticipated to meet the site's parking demands, and will also meet the District's bylaw parking requirements.

The proposed supply for loading, pick-up/drop-off, visitor and staff parking is anticipated to meet the daily demands, and the hammerhead facility will accommodate up to a fire truck sized vehicle for turnaround.

### 5.2 Recommendations

It is recommended to provide corner bulges at the site access on 21<sup>st</sup> Street. They will be in keeping with the current design at Kiwanis Manor parkade access also on 21<sup>st</sup> Street, as well as the Gordon/21<sup>st</sup> and Gordon/22<sup>nd</sup> intersections. The corner bulges will also serve to improve sight lines for outbound traffic by shifting on-street parking away from the access, and by allowing vehicles to pull further forward to a position of much greater sight lines before fully exiting the site.

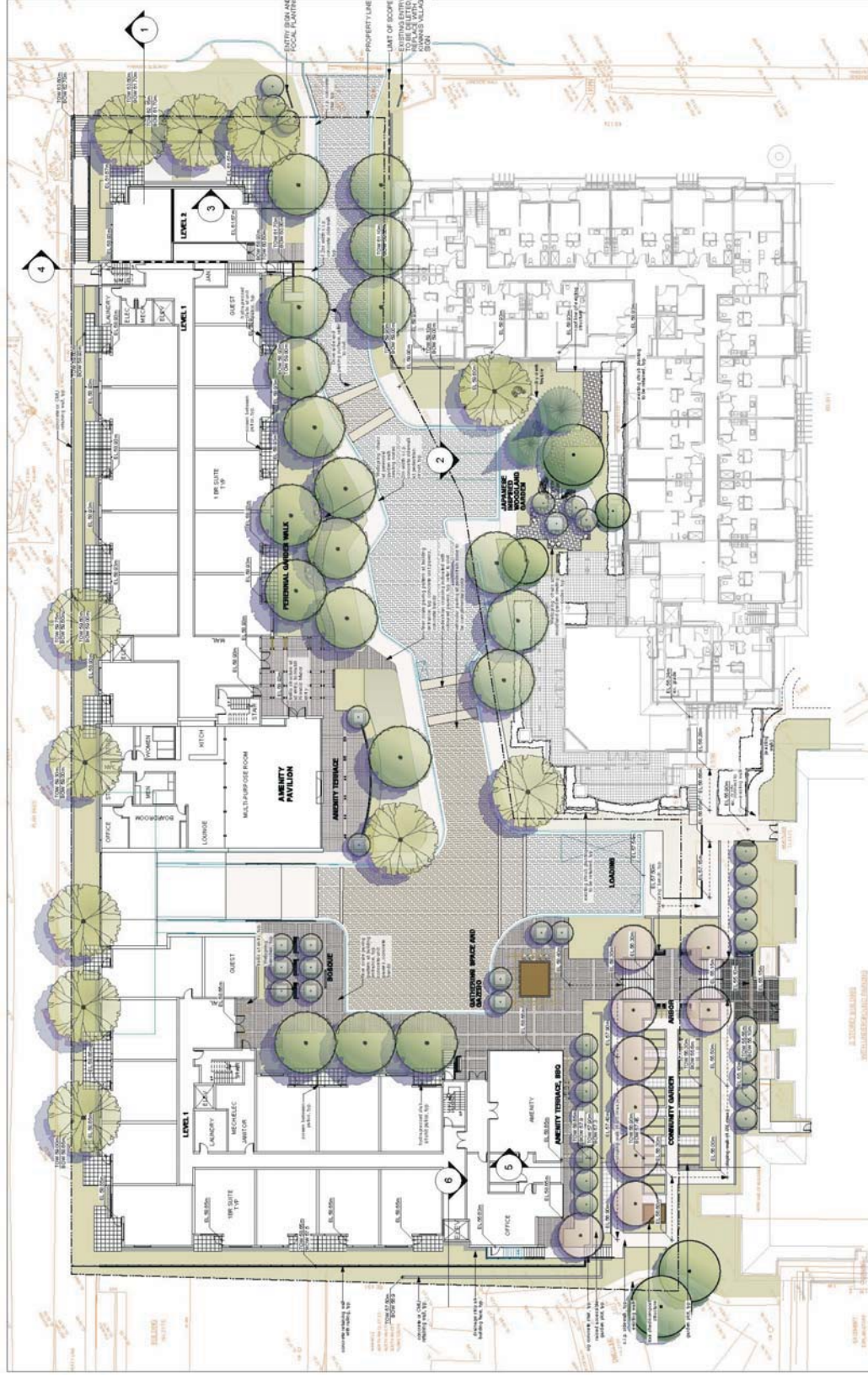
\* \* \* \* \*

I trust this report will be of assistance to you. Please do not hesitate to contact me should you have any questions regarding our study methodology or findings.

Yours truly,  
Bunt & Associates



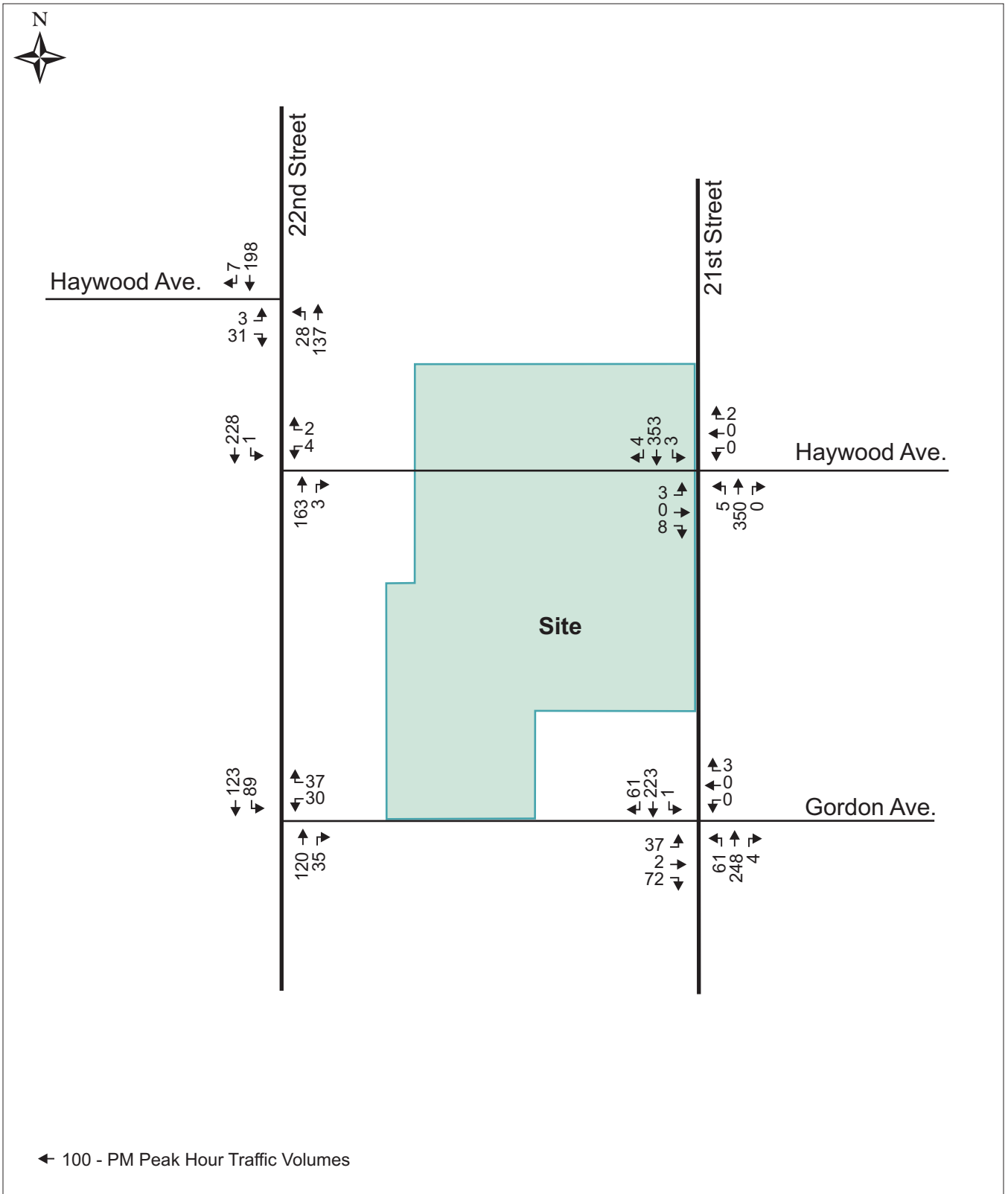
Sarah Allen, P.Eng.  
Transportation Engineer



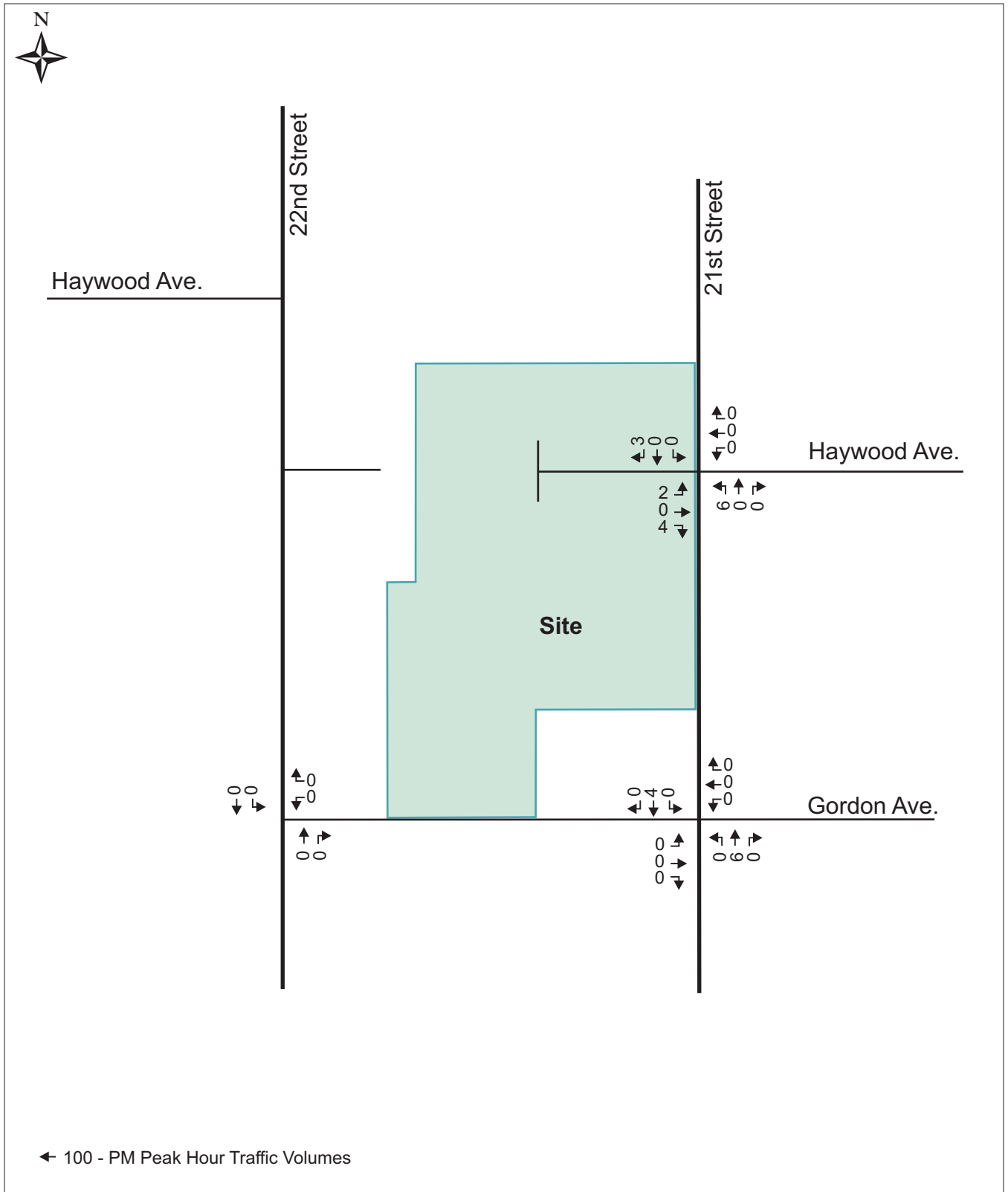
## Exhibit 1.1

# Proposed Site Plan Layout

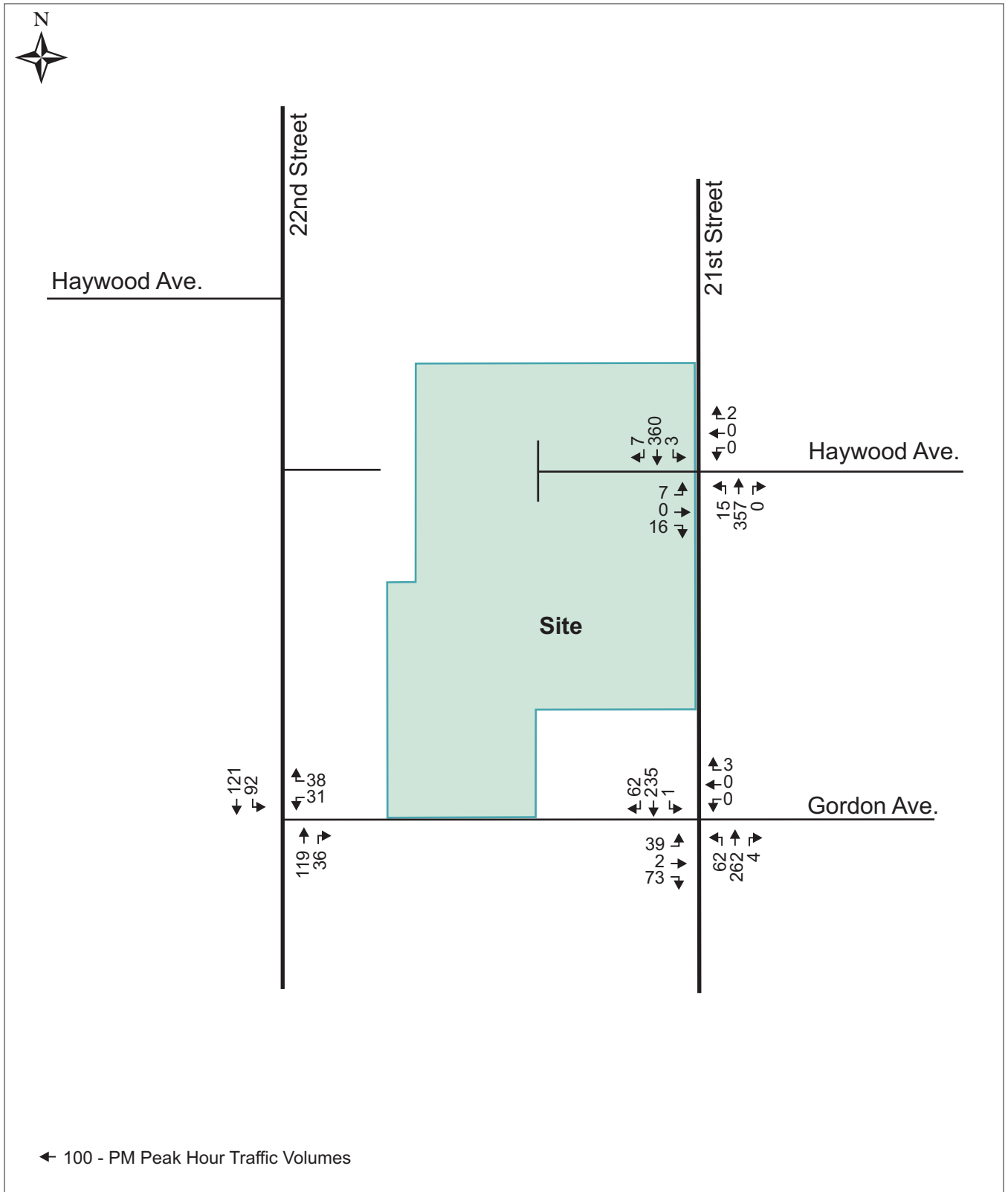
Kiwanis Garden Village Phase II Redevelopment  
4778.01 January, 2011 Scale NTS



## Exhibit 2.1 Existing 2011 Traffic Volumes



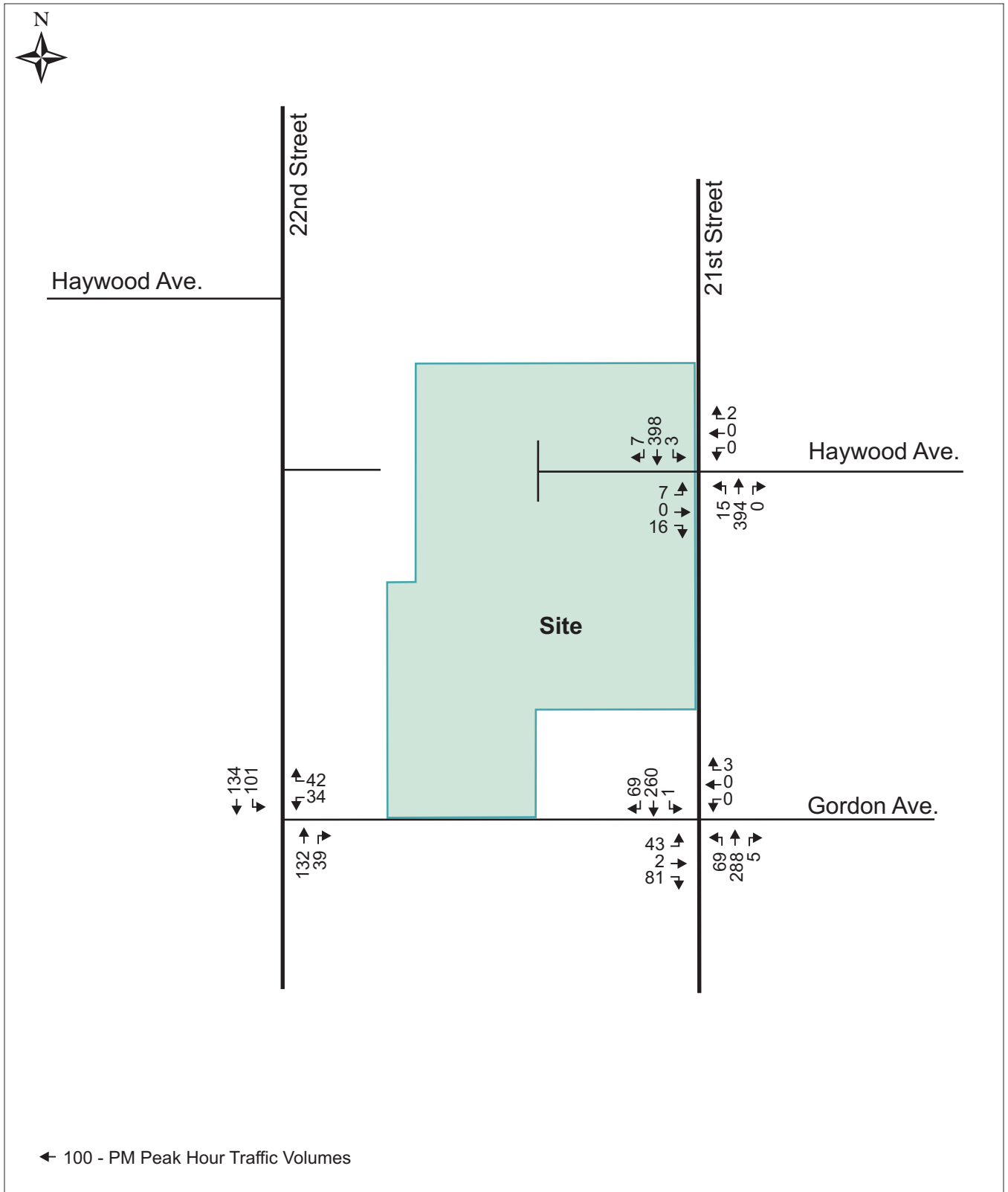
## Exhibit 2.2 Estimated Site Generated Traffic Volumes



**Exhibit 2.3**

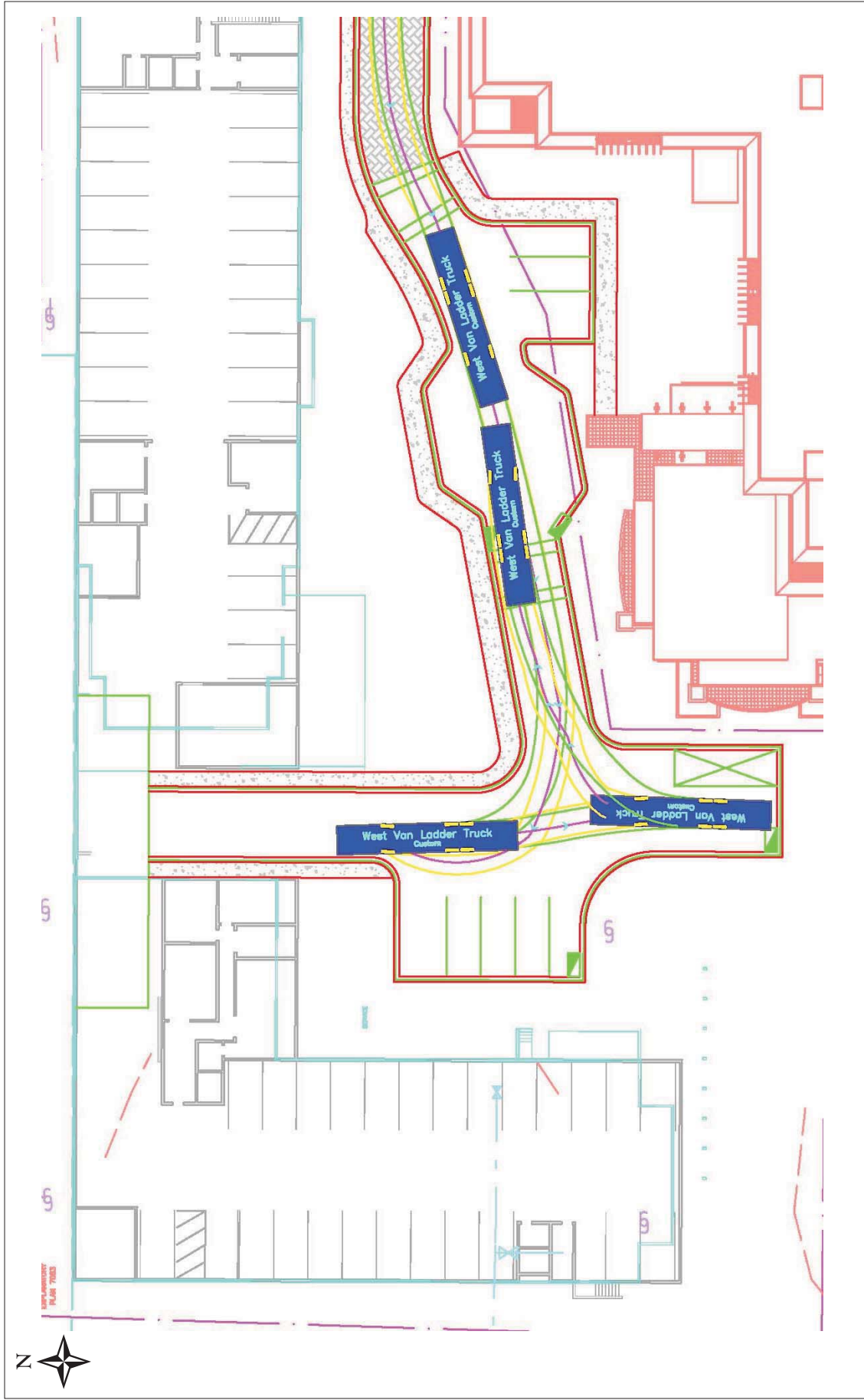
**Estimated Total 2013 Traffic Volumes**





**Exhibit 2.4**

# Estimated Total 2023 Traffic Volumes



# Exhibit 4.1 Site Circulation – Fire Truck



April 20, 2011  
4778.01

Ms. Lisa Berg  
District of West Vancouver  
750 - 17th Street  
West Vancouver, BC V7V 3T3

Dear Lisa:

**Re: Kiwanis Garden Village Phase II Redevelopment  
Addendum #1 to Traffic Study Report**

We have prepared this letter as Addendum #1 to our Traffic Study Report dated February 10, 2011. The purpose of this addendum is to respond to District comments dated March 11, 2011 and to also respond to comments received at the Design Review Committee meeting. This letter specifically addresses the items related to transportation planning, and the responses are numbered as per the District's letter.

#### **Comment 1b - Visitor and Employee Parking**

**District staff requested further review of the proposed visitor and employee parking supply.**

At completion, the Kiwanis Seniors Housing Garden Village project will provide 129 parking spaces for the total 303 dwelling units on site. This translates to 0.43 parking spaces per dwelling unit which more than satisfies the District of West Vancouver Zoning Bylaw requirement of one space per three dwelling units for this form of housing.

Bunt & Associates' database information for "independent living" seniors housing facilities in the Metro Vancouver Region indicates that on average the parking requirement for this form of seniors accommodation is 0.32 parking space per unit, including 0.25 spaces per unit for residents, 0.02 spaces per unit for staff, and 0.05 spaces per unit for visitors. Applying these figures to the Kiwanis Garden Village project, at completion the anticipated parking requirements will be 75-80 spaces for residents, 6 spaces for staff, and 15 spaces for visitors. Observation by Bunt & Associates for the existing Kiwanis Court and Kiwanis Manor buildings plus the 51 bachelor apartments on site (214 units total) indicate that the peak daytime visitor parking demand was 7 vehicles (0.03 spaces per unit), and a single space required for staff parking (nearly all the existing staff commute by public transit).

The proposed site plan provides for 12 visitor parking spaces on-site, including 4 spaces located in the underground parking beneath the proposed new "east" building, 5 spaces in the courtyard area fronting the proposed new "west" building, and 3 spaces in the courtyard area fronting the existing Kiwanis Manor building.

**Bunt & Associates Engineering (BC) Ltd.**

Suite 1812 – 1177 West Hastings Street, Vancouver, BC V6E 2K3 Tel 604 685 6427 Fax 604 685 6579

Vancouver Victoria Calgary Edmonton [www.bunteng.com](http://www.bunteng.com)

Additional parking for visitors is available on the south side of Gordon Avenue, which is well suited for the existing Kiwanis Court Building which fronts onto Gordon Avenue. As noted above, the existing staff parking requirements for the facility are minimal; notwithstanding this, it is recommended that 6 parking spaces on-site be allocated for staff parking.

### Comment 3a - Additional Traffic Analysis

**District staff questioned whether the Weekday PM peak hour is the busiest traffic period for the site, and whether a Saturday may be busier given the likelihood of more visitors.**

Bunt & Associates staff conducted additional full day traffic counts (8am - 8pm) on a Weekday and a Saturday to confirm the peak traffic activity periods for the existing site. Counts were conducted on Tuesday March 29, 2011 and on Saturday April 2, 2011. The counts captured volumes in/out of the site at the five site access points: 21st/Haywood, 22nd/Haywood, the 21st Street Parkade and the Gordon Avenue Parkades. The count data is summarized in Table 1.

**Table 1 - Observed Peak Hour Site Traffic Volumes**

Peak Hour Period	Time	Volumes
Weekday AM	8:15 - 9:15am	23 (9 in, 14 out)
Weekday Mid-Day	12:45 - 1:45pm	43 (25 in, 18 out)
Weekday PM	3:30 - 4:30pm	42 (23 in, 19 out)
Saturday Mid-Day	11:30am - 12:30pm	30 (12 in, 18 out)
Saturday PM	2:30 - 3:30pm	30 (15 in, 15 out)

As shown, the peak hour of site traffic generation occurs during the Weekday Mid-Day and Weekday PM peak hour periods. The traffic study capacity analysis, which focused on the PM peak hour, has therefore captured the busiest period of site traffic generation, which is also typically the busiest period for adjacent street traffic.

At the time of our traffic counts there was construction on 21st Street, about 1 block north of the site that completely closed a small section of 21st to any through traffic. While we do not expect this to have changed the volume of traffic arriving at and leaving the Kiwanis site, it did have an impact on through traffic volumes on 21st and likely on 22nd Street as well, and as such it was not possible to get volumes passing the site on these adjacent streets during the AM and Saturday peak hour periods. If AM peak hour or Saturday traffic analysis is still required, we will have to wait until after completion of the construction on 21st Street, which at the time of this letter was still ongoing.

### Comment 3b - Fire Truck Circulation

District staff requested confirmation on the hammerhead size and manoeuvrability for fire trucks.

The Development Team met with the Fire Department in the early stages of the project to review the site plan including specifically the suitability of the hammerhead turnaround. At that time, the fire department had no concerns with the proposed hammerhead facility. As part of our traffic study, the hammerhead design was reviewed in AutoCAD with the AutoTurn 6.0 software package, using a custom designed vehicle based on specs provided by the West Vancouver Fire Department for their largest ladder truck vehicle. **Exhibit 4.1** from our traffic study, and included at the end of this letter, illustrates the turning path required for a fire truck to turnaround in the hammerhead facility and indicates that there is sufficient space.

### Additional Comments from Design Review Committee

**Request for a boulevard along 21st Street to separate the sidewalk from the road.**

The existing topography, which slopes steeply away from 21st Street, does not leave much space with which to provide a boulevard without significantly impacting the landscaping next to the existing Kiwanis building, and ultimately requiring the removal of mature hedges.

The traffic volumes and speeds on 21st Street are not at such a level that a boulevard would be required for pedestrian safety reasons, and it is further noted that there are currently no boulevards on the west side of 21st Street, between the Kiwanis site and Marine Drive.

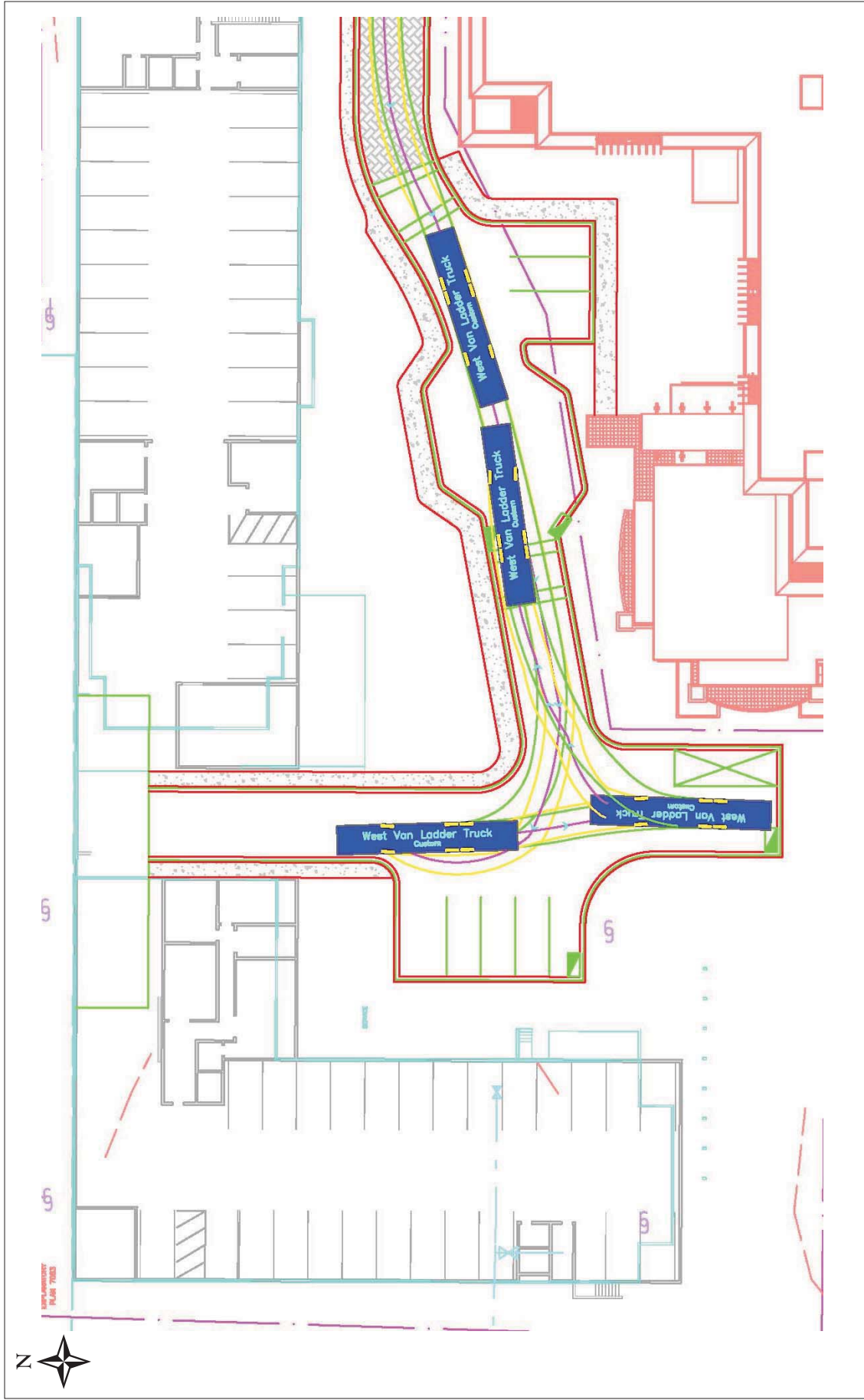
We trust this letter will be of assistance to you. Please do not hesitate to contact us should you have any questions.

Yours truly,

**Bunt & Associates**



Sarah Allen, P.Eng.  
Transportation Engineer



# Exhibit 4.1 Site Circulation – Fire Truck