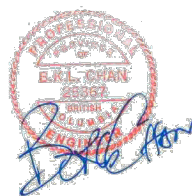


Inspiring sustainable thinking



District of West Vancouver
Ambleside Off-Street Parking Study



Final Report



February 2019



District of West Vancouver – Ambleside Off-Street Parking Study

Final Report

Client	District of West Vancouver 750 17 th Street West Vancouver, BC V7V 3T3
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Date Issued	February 6, 2019



2019-02-06



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February 6, 2019

Our Reference: 32041

District of West Vancouver
3755 Cypress Bowl Road
West Vancouver, BC V7S 3E7

Attention: Mr. John Calimente, MCIP, RPP, Transportation Planner

Dear Sir:

Reference: District of West Vancouver Ambleside Off-Street Parking Study – Final Report

ISL Engineering and Land Services is pleased to submit two hard copies and a USB drive containing the electronic (PDF and Microsoft Word) copy of the Final Report (February 2019), as well as working files (Excel), for the **District of West Vancouver Ambleside Off-Street Parking Study**.

Thank you for giving ISL Engineering and Land Services the opportunity to undertake this challenging study on your behalf. We look forward to assisting the District of West Vancouver in conducting follow-up work on the recommendations and/or other challenging traffic engineering (traffic analysis, road safety, and parking review) studies.

Should you wish to discuss any aspect of this report, please do not hesitate to contact us.

Sincerely,

²⁰¹⁹⁻⁰²⁻⁰⁶
Borg Chan, M.Sc., P.Eng., PTOE, RSP, FITE
Manager, Traffic Engineering and Road Safety



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Executive Summary

The District of West Vancouver (the District) is located on the north side of the Burrard Inlet generally bounded by the Capilano River in the east (District of North Vancouver) and Montizambert Creek in the north. The Ambleside Commercial Area is located in the central-southern area of the District and is one of its major commercial areas. Similar to many other commercial areas, off-street parking (both private and public) is available for a majority proportion of existing developments. As well, the surrounding on-street parking is in high demand for much of the day. In order to satisfy the parking demand for the future growth of non-residential developments, there have been requests for a public off-street parking facility to satisfy the existing and future parking demands within the area. ISL Engineering and Land Services (ISL) has conducted this off-street parking study for the Ambleside Area to provide a thorough review of existing and future parking supply and demand.

The study area of this *Ambleside Off-Street Parking Study* is located within the following boundaries (as shown in **Figure ES.1**):

- 13th Street in the east, including the surface parking lot for tennis courts in Rutledge Field;
- 19th Street in the west, but not including Memorial Park;
- Burrard Inlet in the south, including surface parking lot for John Lawson Park; and
- Clyde Avenue and laneway north of Marine Drive in the north.

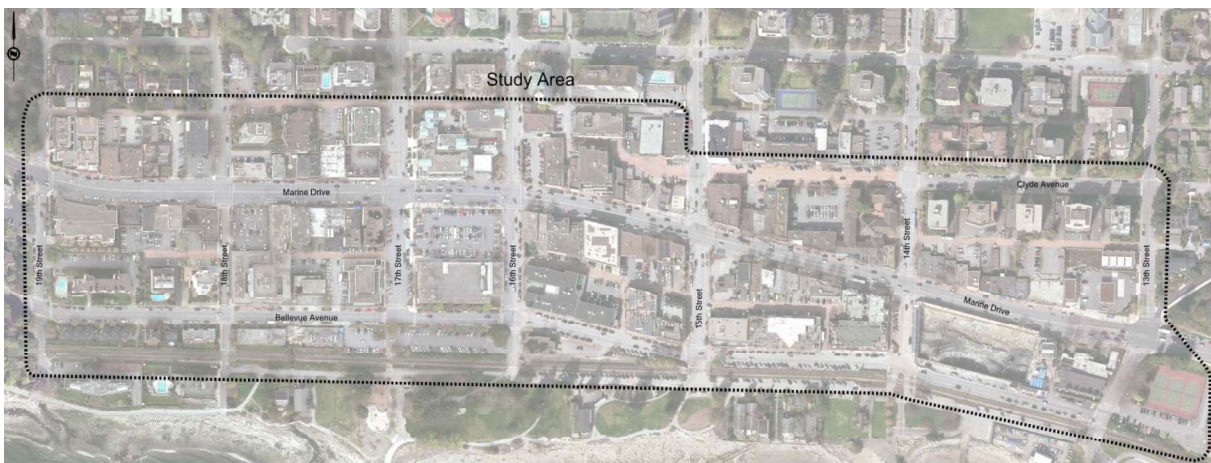


Figure ES.1: Ambleside Parking Study Area

Prior to the parking utilization and duration surveys undertaken on March and September 2018, a parking inventory survey was conducted to determine the number of available on-street parking stalls for each curb face within the study area. Within the Ambleside Commercial Area, on-street parallel, and angle (45-degree) parking stalls with 2-hour parking limit are provided as well as shorter parking time limit restrictions (5-minute, 15-minute, and 1-hour). As well, no time limit on-street parking zones are also found within the study area.

Off-street parking was sub-divided into two categories within the study area; Public and Private. In the parking utilization survey analysis, public off-street parking lots in John Lawson Park, along Argyle Avenue, and at the Tennis Courts are combined with the on-street parking data. Based on the parking inventory survey, a total of **766** on-street and public off-street parking stalls were recorded within the study area. A majority of the stalls had a 2-hour time limit (*473 stalls, 62%*).



In addition to public parking, the parking inventory survey for all identified private off-street parking lots was also conducted. Private off-street parking included a variety of parking types including back-lane parking, private parkades, and surface commercial parking lots. All private off-street parking was limited to customers and staff only, meaning that signage and/or pavements markings were posted restricting use to customers and/or staff of specific businesses. Based on the inventory survey results, a total of approximately 1,083 private off-street parking spaces were recorded. Some of the recorded off-street parking had a time limit restriction (15-minute, 1-hour, or 2-hour); however, a large portion (72%) of the private off-street parking did not provide any time limit.

The parking utilization surveys were conducted on Thursday April 21, 2018 and Wednesday September 27, 2018 (typical weekdays), during the four peak parking periods, consistent with the previous parking studies.

To effectively determine the parking supply / demand forecast, the Ambleside Commercial Area was subdivided into the following three Sub-areas:

- **Sub-Area 1 (East):** Bounded by 13th Street (west), 14th Street (east), Clyde Avenue (north), and Bellevue Avenue (south), including on-street parking on both sides of 14th Street as well as The Residence on Marine, Grosvenor Ambleside developments and the Tennis Court.
- **Sub-Area 2 (Central):** Bounded by 14th Street (west), 16th Street (east), laneway north of Clyde Avenue (north), and Argyle Avenue / John Lawson Park (south), including the on-street parking on both sides of 16th Street and the 14th Street site.
- **Sub-Area 3 (West):** Bounded by 16th Street (east), 19th Street (west), laneway north of Marine Drive (north), and John Lawson Park / Bellevue Avenue (south), including Fresh Street Market.

On-street and public off-street parking utilization results for the three Sub-areas and four survey periods have been summarized in **Table ES.1**.

Table ES.1: On-Street and Public Off-Street Parking Utilization Survey Results – By Sub-Area

Location	Capacity	8:30am		10:00am		12:30pm		3:30pm		Average Spaces Utilized	Average Percent Utilization (%)
		Spaces Utilized	Percent Utilized (%)	Spaces Utilized	Percent Utilized (%)	Spaces Utilized	Percent Utilized (%)	Spaces Utilized	Percent Utilized (%)		
Sub-Area 1 (East)	172	75	44%	106	62%	133	77%	111	65%	106	62%
Sub-Area 2 (Central)	321	116	36%	286	89%	298	93%	251	78%	238	74%
Sub-Area 3 (West)	273	125	46%	236	86%	230	84%	214	78%	201	74%
Total	766	316	41%	628	82%	661	86%	576	75%	545	71%

Based on the survey results, the overall parking utilization rate ranged from 41% (8:30 to 9:00am) to 86% (12:30 to 1:00pm). The typical weekday parking utilization results show that the parking utilization rate is relatively low in the morning and rises throughout the day until the peak around noon, start to slightly decrease after lunch. The private parking had similar parking utilization rate pattern with a low parking utilization rate in the morning which increases throughout the day until the peak around noon, then decreases after lunch.

Based on the review of similar parking studies conducted in the Lower Mainland, generally, a utilization rate of between 75% and 85% is considered an industry best practice and this value is cited often. Therefore, the parking utilization rate of 85% is considered as the **Maximum Ideal Utilization** (or parking capacity threshold) in this study.



It was noted that the parking utilization rate for On-street and Public Off-street parking was above the Maximum Ideal Utilization for specific zones during specific peak times, including; within Sub-area 2 and Sub-area 3 at 10:00AM and within Sub-area 2 at 12:30PM.

A parking duration/turnover (license plate) survey was also conducted on Wednesday May 2, 2018 in 30-minute intervals between 10:30am and 2:30pm (total 4 hours), resulting in a total of 8 intervals. The parking duration / turnover survey results showed that about 54% of total vehicles parked for a short-time (less than 30 minutes). The 85th percentile of surveyed vehicles were parked for less than 1.5 hours on a typical weekday.

It was observed that 95% of parked vehicles were compliant with parking regulations in the Ambleside Commercial Area (parked in the same stall for less than the signed parking time limit). It was noted that parking violations were generally found to be more frequent on the south side of Bellevue Avenue between 14th Street and 15th Street. There were also generally more parking violations noted along 15th Street (west side) and 16th Street (both sides), due to the shorter parking time limit (ranging from 15 minutes to 1 hour).

The percentages of vehicles parked on-street for less than one hour in duration were 81% in the 2-hour parking limit zones and 84% within 1-hour parking limit zones. Therefore, the vast majority of surveyed vehicles parked for one hour or less.

Zoning Bylaw parking requirements for the commercial land use (retail stores or personal services) from various municipalities within the Lower Mainland were compiled and compared. The parking rates ranged from 13 spaces (City of North Vancouver) to 54 spaces (District of West Vancouver) per 1,000 square metres of commercial land area. Similar recent parking studies were also identified and reviewed, in order to compare the study results with other commercial areas throughout the Lower Mainland.

Comparing the latest 2018 survey results (both April and September) for this study with the 2014 and 2015 parking utilization survey results from the previous parking studies for the District, it was found that the parking utilization rates for each time period were generally similar and stable over the last few years. Although the number of surveyed parking spaces was different due to the changes in study areas and construction, the maximum change in utilization from 2014 to 2018 was generally less than 5%. Therefore, parking demand will likely remain consistent within the Ambleside Commercial Area, and any changes in parking demand will be primarily due to new developments.

In order to estimate the additional public (on-street and off-street) parking demand due to new development and/or changes in land use, a **Parking Demand Forecasting Model** was developed to determine the public parking demand within the Ambleside Commercial Area.

The number of private off-street parking spaces are directly proportional to the retail / commercial land-use area, i.e. GFA. The model assumes that parking demand within the Ambleside Commercial Area is mainly driven by retail / commercial land use. Based on the District's *Zoning Bylaw No. 4662*, one parking space is required for 37 sq. m. (or 400 sq. ft.) GFA of commercial use. **Parking Demand Ratio** is calculated by taking the private off-street parking capacity (from the latest inventory survey) and divided by the combined (private off-street and public on-street/off-street) parking demand in the peak period (from the latest utilization survey). The parking demand ratios for each Sub-area ranged from 1.59 to 1.06 and an average parking demand ratio of **1.25** is applied for the overall study area.



Applying the similar forecasting methodology and assuming that the new on-site parking spaces are fully utilized during the peak hours, the surplus or shortfall of public parking could be determined using different commercial development growth scenarios. **Figure ES.2** shows the expected public parking utilization for varying commercial development growth scenarios within each sub-area.

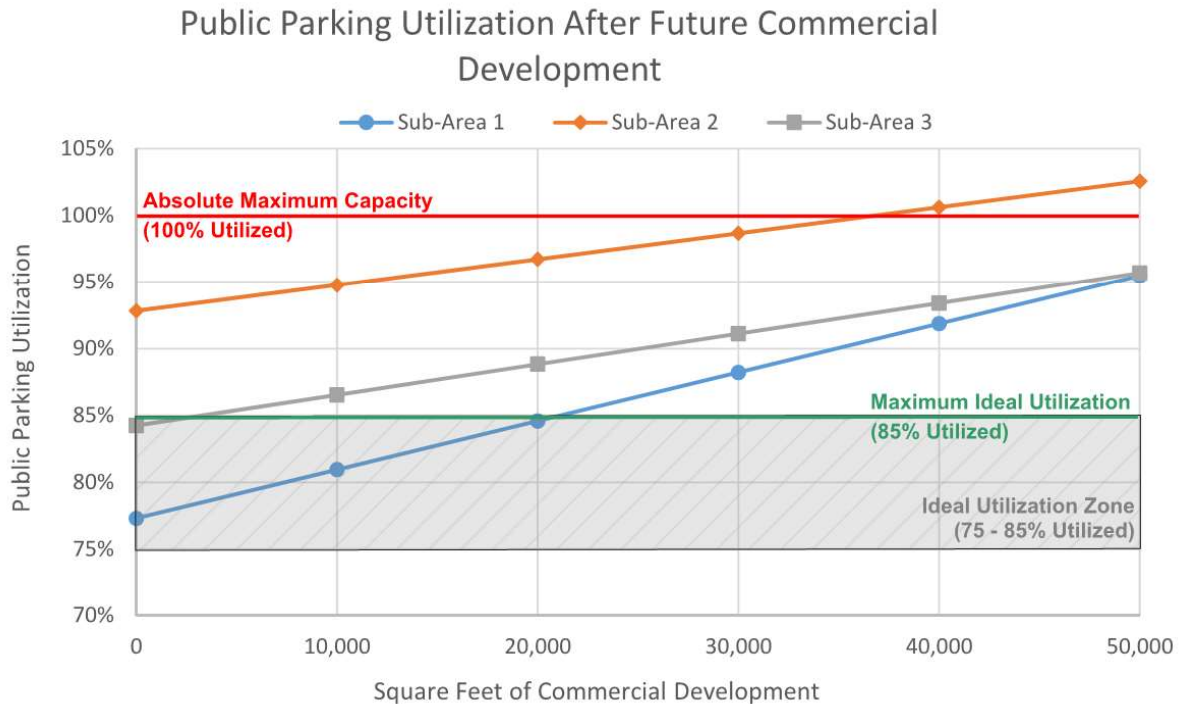


Figure ES.2: Public Parking Utilization after Future Commercial Development Scenarios

Assuming similar parking rates would be applied for new developments within the area and applying the estimated parking demand ratio, it was determined that approximately 20,000 sq. ft. of new commercial GFA could be accommodated in Sub-area 1 before the public parking reaches Maximum Ideal Utilization (85% capacity) assuming the provided on-site parking capacity is also utilized. Considering the Maximum Ideal Utilization, Sub-area 2 requires additional parking provision (25 parking spaces) without any new development and Sub-area 3 would require additional public parking for any new development that is implemented.

To increase the parking supply in the Ambleside Commercial Area, the development of a parking structure could be considered. Seven identified potential redevelopment sites within the Ambleside Commercial Area were originally considered; however, with the existing available site sizes, only three sites could be further reviewed as the potential locations to develop parking structures: Tennis Court, 14th Street Site, and Fresh Street Market. Based on the review, District could consider to give priority in the construction of the parkade at 14th Street Site in the future. Since this parkade is located in Sub-area 2 on the north side of Marine Drive, this would satisfy the parking demand for this sub-area. Extensive public engagement should be organized if the site is to be redeveloped to a multi-level parkade structure. With the high-level estimates, the construction cost for a parking structure to fit 14th Street site could require \$25 Million to \$30 Million.



The development of a parking structure could take some time to plan and implement; therefore, some short-term measures could be considered in order to manage current and future on-street and public off-street parking demand. The objective of short-term improvements is to maintain efficient use of public parking facilities while maintaining an 85% parking utilization. Short-term improvements that could be considered include:

- Increase utilization of private off-street parking
- Generate shared-parking opportunities amongst private property owners
- Increase parking turnover in the popular areas by reducing time limits
- Longer time limit parking spaces to be provided outside the prime area with corresponding signs
- Enforce parking regulation during peak periods by District's Bylaw staff, especially at the locations with the proposed reduction in on-street parking time limits
- Encourage alternative modes with improving public transit, walking and cycling conditions to expand the range of destinations currently serviced by a parking facility and reduce automobile trips
- Consider pay parking

It is expected that B-line bus service along Marine Drive could be integrated with a potential parkade structure, such as having a transit stop or hub on the site or nearby. Implementation of the B-line service could have many potential impacts on parking within Ambleside, including mode shift, due to increased convenience of choosing transit, and long distance transit rider parking. Potential increase in long-term parking near transit stops would need to be addressed.

In addition to constructing a potential parking structure, the District could also consider negotiating with developers the use of public parking spaces within new developments in Ambleside Commercial Area. Based on research and discussion with local architects and quantity surveyors, a typical parking stall within the North Shore area could cost approximately \$45,000 to \$50,000.

With pay parking, rates could be strategically set to optimize parking facility use, meaning prices are set for specific locations and times in order to achieve an 85% utilization, and this is called performance-based pricing. It is important to implement a system that has clear and easy to understand pay system in place, adjustable rates throughout the day or week and, advanced payment methods which would enable the District to monitor and observe duration and turnover information more effectively allowing for adjustments and management of the parking within the area.

Before considering implementing a pay parking system, a complete and detailed implementation program should be conducted, including identification of the pay parking structure, stakeholders and public consultation and even a pilot program in certain areas to understand and receive users' and business owners' feedback to ensure a pay parking system can be implemented effectively.

In addition to future development affecting the parking demand, other external factors may influence it. It is found that significant changes in technologies that will not only influence driving behaviour but also people's parking behaviours. Technologies such as the provision of achievable Transportation Demand Management (TDM) measures, rapid transit, ride sharing and autonomous vehicles may lead to reductions in parking demand as people's transportation habits shift.

This report has summarized the existing parking condition within the Ambleside Commercial Area and forecasted the future parking demand. Recommendations have been provided in order to achieve and maintain parking utilization below the Maximum Ideal Utilization (85% Capacity).



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1.0 Introduction

1.1 Study Background

As a vibrant commercial district located within the heart of the District of West Vancouver (the District), the Ambleside Commercial Area is a popular destination for both local residents and out-of-town visitors. Similar to many other commercial areas, off-street parking (both private and public) is available for a majority proportion of existing developments. As well, on-street parking is generally in high demand for much of the day. In order to satisfy the parking demand for the future growth of non-residential developments, there have been requests for a public off-street parking facility to satisfy the existing and future parking demands within the area.

Therefore, the District contracted ISL Engineering and Land Services (ISL) to conduct an off-street parking study for the Ambleside Commercial Area. Building on a previous parking study completed in 2012, the District requested a thorough review of existing and future parking supply and demand to determine the need and size of a potential off-street parking facility, such as multi-level parkade structure.

1.2 Study Objectives

The objectives of this study are to establish the existing parking condition (for both on- and off-street, public and private), forecast future parking surplus / shortfall, identify existing and potential parking demand issues, and determine whether / where / when additional public off-street parking facility be required.





2.0 Study Area

2.1 Study Area Boundary

The District of West Vancouver is located on the north side of the Burrard Inlet generally bounded by the Capilano River in the east (District of North Vancouver) and Montizambert Creek in the north. The Ambleside Commercial Area is located in the central-southern area of the District and is one of its major commercial areas.

As specified by the District, the study area of this *Ambleside Off-street Parking Study* is located within the following boundaries (as shown in **Figure 2.1**):

- 13th Street in the east, including the surface parking lot for tennis courts in Rutledge Field;
- 19th Street in the west, but not including Memorial Park;
- Burrard Inlet in the south, including surface parking lot for John Lawson Park; and
- Clyde Avenue and laneway north of Marine Drive in the north.

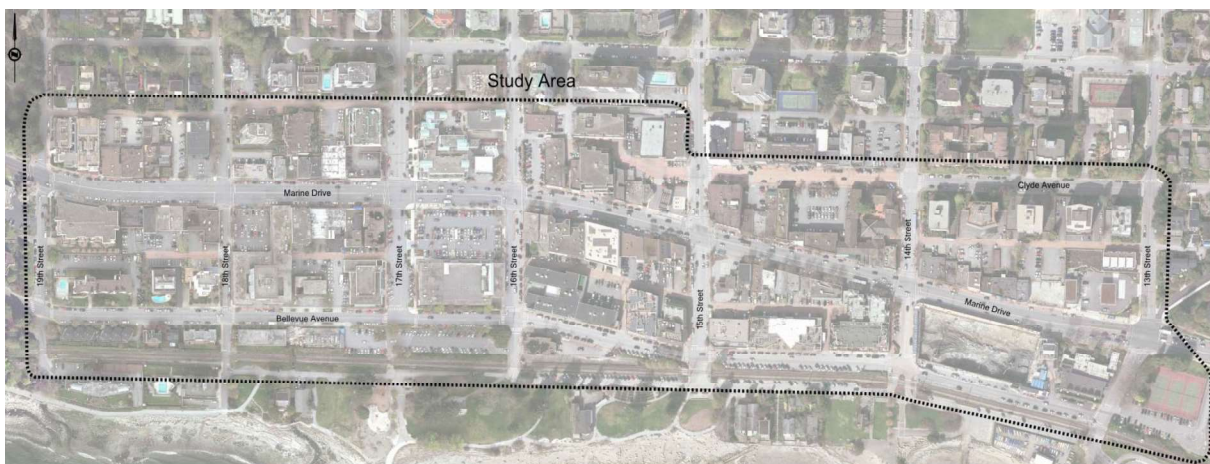


Figure 2.1: Ambleside Parking Study Area

2.2 Residential Parking Impacts

The majority of land uses, in the Ambleside Commercial Area, are non-residential uses (retail stores, restaurants, and office buildings); however, a few existing residential buildings and future mixed-use developments are found within the study area. As residential parking is mainly assigned and separated from the commercial parking area, residential (both resident and visitor) parking was not recorded in both parking inventory survey and parking utilization survey for this parking study. Although some residential visitor stalls may be shared with the commercial parking area or some residential visitors may use the nearby on-street parking, the residential visitor parking demand mainly occurred during the weeknights and weekends and did not conflict with commercial parking peak hours. Therefore, this parking study is mainly focused on the commercial parking demand/supply in the Ambleside Commercial area.



3.0 Parking Survey Methodology

3.1 Parking Inventory Survey

Prior to the parking utilization survey and parking duration survey, a parking inventory survey was conducted to determine the number of available on-street parking stalls for each curb face within the study area as of March 2018 and September 2018. During the parking inventory survey, stalls were counted as marked with the provision of pavement markings; however, where they were not marked, parking stalls were estimated based on standard parking lengths (7 metres long for parallel parking stalls).



Both public and private off-street parking inventory surveys were also undertaken, including the number and location of the parking stalls. The new Grosvenor Ambleside development (1327 and 1355 Bellevue Avenue) was included in September survey. Similar to on-street parking, where stalls were not marked, the number of parking stalls were estimated based on the available parking stall dimensions and its general operation. During the parking inventory survey, the off-street parking areas were identified as private or public, employee and/or customer only as well as time restricted.

3.2 Survey Periods

In agreement with District staff, the parking utilization surveys were conducted on Thursday April 21, 2018 and Wednesday September 27, 2018 (both are typical weekdays). In order to capture the peak parking periods and remain consistent with the previous parking study, four parking survey periods were conducted, including 8:30 to 10:00am, 10:00 to 11:30am, 12:30 to 2:00pm and, 3:00 to 4:30pm. Generally, the on-street parking survey was conducted within the first 30-minutes of each survey period while the off-street parking survey was conducted during the remaining hour.



The parking duration / turnover (license plate) survey was also conducted on Wednesday May 2, 2018 in 30-minute intervals between 10:30am and 2:30pm (total 4 hours), resulting in a total of 8 intervals. Each surveyor carried an introduction letter prepared and signed by the District's Project Manager to verify the surveyors' identities. The introduction letter can be found in **Appendix A**.

3.3 Parking Utilization Survey

For the entire study area, on- and off-street parking demand was collected using the parking utilization survey by counting the number of parked vehicles. The number of vehicles parked on-street within the study area was recorded for each block face. The parking demand was compared to the number of available spaces (supply), based on parking inventory survey. Therefore, the parking utilization rate for each block face was able to be determined. The parking utilization rate is presented as a percentage (utilized spaces over available spaces), while 100% utilized would mean that vehicles occupied all possible parking spaces.



3.4 Parking Duration Survey

In order to determine the parking duration, a vehicle license plate survey was conducted for a designated area within the Ambleside Commercial Area. The study area for the license plate survey was chosen and agreed on with the District to reflect the potential modification of parking time restriction. The survey area included both sides of; Marine Drive and Bellevue Avenue between 14th Street and 16th Street; and 15th and 16th Streets between Bellevue Avenue and Marine Drive. The survey area for the parking duration is shown in **Figure 3.1**.



Figure 3.1: Area Included in the License Plate Survey

During the parking duration survey, one surveyor walked past each curb face in the identified area and collected partial license plate numbers (last 3 digits) from parked vehicles for each identified parking stall. Vehicles parked on-street were recorded in 30-minute intervals for the entire 4-hour survey period during a typical weekday. Since each individual vehicle was given an identifier (partial license plate), the parking duration for each vehicle could be estimated from the first interval it was recorded and the interval in which it was not recorded again.



4.0 Parking Survey Results

4.1 Existing Parking Conditions

On-Street Parking and Public Off-Street Parking

Existing on-street parking conditions (marked/unmarked spaces) within the study area were identified during the parking inventory survey. The drawings showing existing parking conditions (various parking restrictions as of September 2018) in the Ambleside Commercial Area, including Bellevue Avenue between 13th Street and 14th Street, can be found in **Figure B.1 (Appendix B)**.

Within the Ambleside Commercial Area, on-street parallel, and angle parking stalls with 2-hour parking limit are provided along Marine Drive and Bellevue Avenue as well as some north-south streets. Shorter parking time restrictions (5-minute, 15-minute and one hour) can be found along sections of 14th Street, 15th Street, 16th Street and 17th Street. No time limit on-street parking is found along 18th Street and 19th Street (between Marine Drive and Bellevue Avenue), Bellevue Avenue (between 18th Street and 19th Street), and Clyde Avenue (between 13th Street and 14th Street).

Currently, “no parking” allowed signs are found on the north side of Marine Drive between 16th Street and 17th Street. In general, no parking allowed signs are also provided near intersections where on-street parking is not safe or permitted.

In addition to parallel parking, on-street angle (45-degree) parking could be found along 14th Street on the east side and south of Marine Drive, the south side of Bellevue Avenue between 14th Street and 16th Street, and along both sides of 17th Street.

During the parking survey in September 2018, building construction work was occurring on the Grosvenor Ambleside Development (1327 and 1355 Bellevue Avenue) located between 13th Street and 14th Street south of Marine Drive. The construction work partially restricted on-street parking on both sides of Bellevue Avenue between 13th Street and 14th Street, as well as along 13th Street, between Marine Drive and Bellevue Avenue. On-street parking surveys for these road sections were still conducted and included in this study. Traffic operations was also impacted as 13th Street and Bellevue Avenue were restricted to one-way traffic southbound and westbound (respectively) during the time that the parking survey was conducted.

Off-street parking was sub-divided into two categories within the study area; Public and Private. In the parking utilization survey analysis, the following public off-street parking areas are included as part of the on-street parking data:

- John Lawson Park Parking Lot – located on the south side of Bellevue Avenue between west of 16th Street and 17th Street (69 Parking Spaces – 2-Hour Limit)
- Argyle Avenue – located on the south of Bellevue Avenue between 14th Street and 16th Street (73 Parking Spaces – 3-Hour Limit)
- Tennis Court Parking Lot – Located on the southeast corner of the intersection of Marine Drive and 13th Street (50 Parking Spaces – No Time Limit)

Based on the parking inventory survey, a total of **766** on-street and public off-street parking stalls were recorded within the study area. A majority of the stalls had a 2-hour time limit (*473 stalls, 62%*). The complete breakdown of the surveyed parking stalls has been provided in **Table 4.1**.



Table 4.1: Number of On-Street and Public Off-Street Parking Stalls By Parking Restriction

Parking Type	Parking Restriction	Number of Spaces	Percent
On-Street and Public Off-Street Parking	5 Minutes	5	1%
	15 Minutes	17	2%
	1 Hour	35	5%
	2 Hour	495	65%
	3 Hour	73	10%
	No Limit	141	18%
Total		766	100%

Private Off-Street Parking

In addition to on-street parking and public off-street parking, the parking inventory survey for all identified private off-street parking lots were also conducted. **Figure B.2** showing the private off-street parking inventory survey results (as of September 2018), including the underground parking in Grosvenor Ambleside Development, can also be found in **Appendix B**.

Private off-street parking included a variety of parking types including back-lane parking, private parkades, and surface commercial parking lots. The majority of private off-street parking areas were marked; however, where they were not marked, parking stall was estimated based on the observed parking configuration. Based on the survey results, approximately **1,083** private off-street parking spaces were recorded. All private off-street parking were limited to customers and staff only, meaning that signage and/or pavements markings were posted restricting use to customers and/or staff of specific businesses. Some of the recorded off-street parking had a time limit restriction (15-minute, 1-hour, or 2-hour); however, a large portion (72%) of the private parking do not provide any time limit. All back-lane parking within the study area was restricted for specific staff or customer parking. The off-street parking restriction breakdown has been provided in **Table 4.2**.

Table 4.2: Number of Private Off-Street Parking Stalls By Parking Time Limit

Parking Type	Parking Restriction	Number of Spaces	Percent
Private Off-Street Parking	15 Min	22	2%
	1 Hour	158	15%
	2 Hours	122	11%
	No Limit*	781	72%
Total		1,083	100%

*NO LIMIT MEANS THAT SIGNAGE AND/OR PAVEMENT MARKINGS WERE POSTED RESTRICTING THE PARKING TO THEIR CUSTOMERS AND/OR STAFF OF SPECIFIC BUSINESSES WITHOUT PROVIDING A TIME LIMIT

4.2 Maximum Ideal Utilization

When vehicles occupy of on-street parking spaces, it generally forces other drivers to circle the block to find a parking space, causing additional traffic congestion and potential conflicts with pedestrians, cyclists and other vehicles. According to Donald Shoop's book, *The High Cost of Free Parking*, published by the American Planning Association (2005 and 2011), the optimal parking capacity should be targeted as **85%** utilized. The goal is to have about 15% of parking spaces vacant and available at any time, to ensure the effective use of parking facilities and is available for priority and short-term use. Additionally, this limits significant unnecessary oversupply while yielding sufficient free space to consistently find a parking space. Based on a review of similar parking studies conducted in the Lower Mainland, this value is often cited and generally, a utilization rate of between 75% and 85% is considered an industry best practice. Therefore, the parking utilization rate of 85% is considered as the **Maximum Ideal Utilization** (or parking capacity threshold) in this study.



4.3 Parking Utilization Results

For the entire study area, parking demand was collected by counting the number of parked vehicles, for both on-street and off-street. The number of on-street parked vehicles within the study area was recorded for each block face and every parking lot. Comparing this data, the parking utilization rate by each block face and parking lot was determined. The parking utilization rate is presented as a percentage (utilized spaces over available spaces), while 100% utilized would mean that vehicles occupied all possible parking spaces. On- and off-street (both private and public) parking utilization was categorized into 4 groups based on the ranges of parking utilization percentages:

- **86% - 100% (Red Colour)** → at or near parking capacity, available spaces are difficult to find, above the maximum ideal utilization
- **70% - 85% (Orange Colour)** → on or just below the maximum ideal utilization, near industry best practice (75 – 85% utilized).
- **55% - 69% (Green Colour)** → just over half the parking spaces are utilized, not much difficulty finding available spaces.
- **Less than 55% (Blue Colour)** → plenty of open parking spaces available and easy to find vacant parking spaces.

On-street and public off-street parking utilization results have been presented in **Figures B.3 to B.6** (one for each survey interval) in **Appendix B**. Based on the survey results, the overall parking utilization rates ranged from 41% (8:30 to 9:00am) to 86% (12:30 to 1:00pm). The typical weekday parking utilization results show that the parking utilization rates are relatively low in the morning and rise throughout the day until the peak around noon, start to slightly decrease after lunch.

Private off-street parking utilization results were presented in **Figures B.7 to B.10** in **Appendix B**. Based on the off-street parking survey, the overall parking utilization rates ranged from 31% (9:00 to 10:00am) to 63% (1:00 to 2:00pm). The private off-street parking had similar parking utilization rate pattern observed for on-street and public off-street with low parking utilization rates in the morning, which increase throughout the day until the peak around noon, then decrease after lunch.

On-street, off-street, and combined parking utilization results has been summarized in **Figure 4.1**.

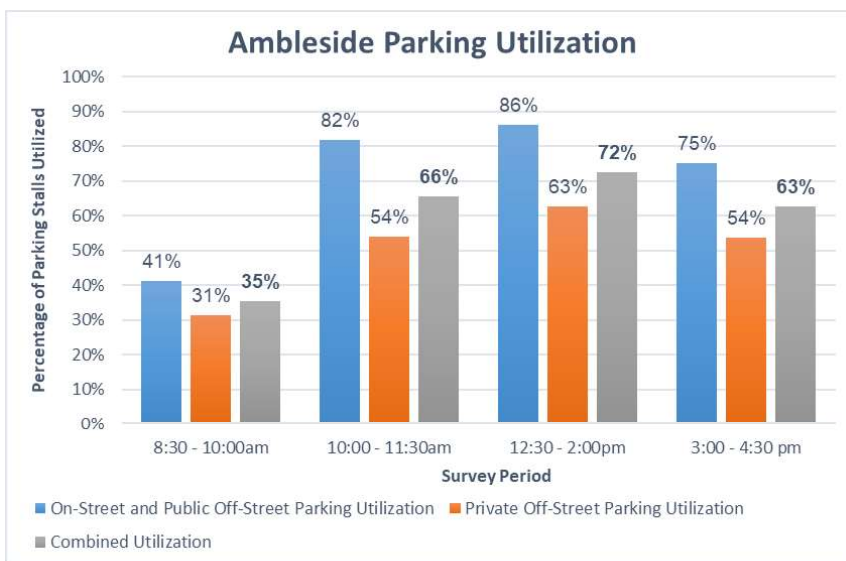


Figure 4.1: Parking Utilization Results (September 2018)



4.4 Parking Duration Results

According to Section 3.4 (Parking Duration Survey), the parking duration for each surveyed vehicle was determined into different periods:

- less than 0.5 hours (vehicle left or other vehicle parked at the surveyed parking stall after 30-minute interval – one survey round)
- less than 1.0 hours (vehicle left or other vehicle parked at the surveyed parking stall after 60-minute interval – two survey rounds)

A similar procedure was used to determine longer times.

The parking duration survey results summary has been provided in **Table 4.3**, including the percentage of time limit compliant vehicles (discussed further in Section 4.5). To better reflect the potential impacts of the parking duration along different corridors during the weekday commercial peak period, the survey data has been presented as cumulative percentages of vehicles by parking duration during the entire study period for a typical weekday, as shown in **Figure 4.2**.

Table 4.3: Parking Duration Survey Results Summary Table (Number of Surveyed Vehicles)

Street	Description	Side	Parking Duration							Total	Compliant	
			< 30 Min	< 1 Hr	< 1.5 Hrs	< 2.0 Hrs	< 2.5 Hrs	< 3.0 Hrs	< 3.5 Hrs			> 4.0 Hrs
Marine Drive	14th Street to 15th Street	NORTH	36	14	4	3	1	0	0	0	58	98%
		SOUTH	36	18	9	5	0	0	0	0	68	100%
	15th Street to 16th Street	NORTH	31	14	6	1	2	0	0	0	54	96%
		SOUTH	40	25	13	1	1	0	0	1	81	98%
Marine Drive Total		BOTH	143	71	32	10	4	0	0	1	261	98%
Bellevue Avenue	14th Street to 15th Street	NORTH	43	21	7	5	0	0	0	0	76	100%
		SOUTH	47	25	19	4	6	2	2	1	106	90%
	15th Street to 16th Street	NORTH	27	22	8	5	0	0	0	0	62	100%
		SOUTH	39	26	5	3	1	0	0	0	74	99%
Bellevue Avenue Total		BOTH	156	94	39	17	7	2	2	1	318	96%
15th Street	Bellevue Avenue to Marine Drive	EAST	10	4	1	0	0	0	0	0	15	93%
		WEST	9	1	4	0	0	0	0	0	14	71%
16th Street	Bellevue Avenue to Marine Drive	EAST	32	3	2	0	0	1	0	0	38	84%
		WEST	20	10	4	1	0	0	0	0	35	86%
15th and 16th Street Total		BOTH	71	18	11	1	0	1	0	0	102	99%
Total			370	183	82	28	11	3	2	2	681	72%
Percent			54%	27%	12%	4%	2%	0%	0%	0%		

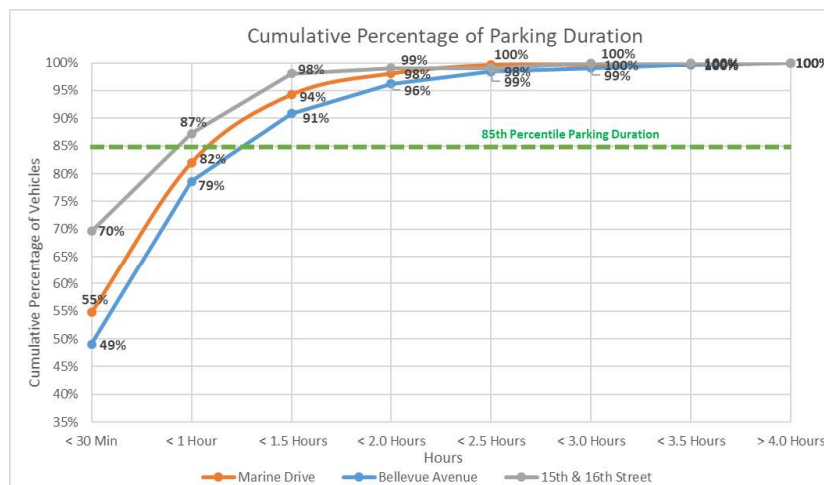


Figure 4.2: Cumulative Percentage of Parking Duration for Separate Roadways



The survey results showed that about 54% of total vehicles parked for a short-time (less than 30 minutes), and **81% of vehicles parked 1 hour or less**. Another observation was that 95% of parked vehicles were compliant with the parking regulation in the Ambleside Commercial Area, meaning they parked in the same stall for less than the signed parking time limit.

In **Table 4.4**, the parking duration was summarized for each parking restriction zone within the study area. It is found that the percentage of on-street parking less than one hour in duration is 81% within a 2-hour parking limit zone and 84% within a 1-hour parking limit zone. Therefore, 1-hour parking durations generally make up a majority of the surveyed parked vehicles.

Table 4.4: Summary of Parking Duration by Road

Road Segment Parking Restrictions	Percentage of Vehicles with Parking Duration in Hours								# of Veh
	< 0.5	< 1.0	< 1.5	< 2.0	< 2.5	< 3.0	< 3.5	> 4.0	
Road Segments with 2 Hour Limit	53%	81%	93%	97%	99%	99%	100%	100%	840
Road Segments with 1 Hour Limit	61%	84%	98%	100%	100%	100%	100%	100%	64
Road Segments with 15 Minute Limit	84%	92%	97%	97%	97%	100%	100%	100%	38

4.5 Parking Time Limit Violations

The number of vehicles exceeding the signed parking time limit for each block curb face for the study period were identified from the parking duration survey, as shown in **Figure 4.3**. The total number of parked vehicle observed during the survey period was also provided for comparison. In comparison, it was noted that parking violations were generally found to be more frequent on the south side of Bellevue Avenue between 14th Street and 15th Street. There were also more parking violations noted along 15th Street (west side) and 16th Street (both sides), possibly due to the shorter parking time limit (ranging from 15 minutes to 1 hour).

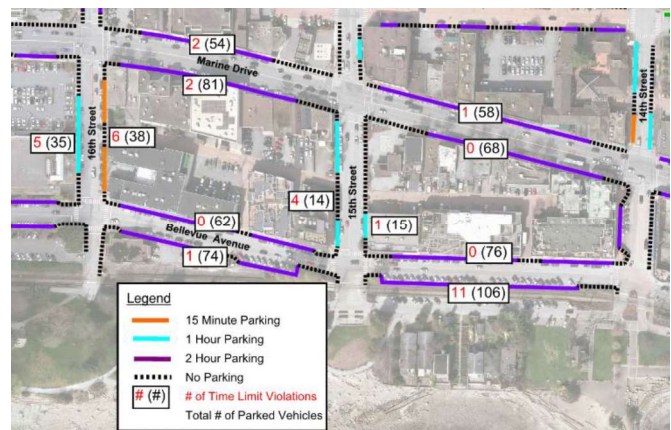


Figure 4.3: Number of Parking Violations within the Survey Area during the 4-Hour Survey



5.0 Parking Bylaw Review

Zoning Bylaw parking requirements for the commercial land use (retail stores or personal services) varies throughout various Lower Mainland municipalities and are summarized in **Table 5.1**.

Table 5.1: Parking Bylaw Review for Similar Municipalities

Municipality	Description	Bylaw Parking Rates	Required Parking for 1000 m ²
District of West Vancouver	Ambleside Centre Zone 1 & 2 (AC1 & AC2)	1 space per 37 m ²	27
	Commercial Zone 1 & 2 (C1 & C2)	1 space per 18.6 m ²	54
District of North Vancouver	Commercial Base Rate	1 space per 45 m ²	22
	Village Commercial Blended Rate	1 space per 30 m ²	33
City of North Vancouver	Retail-Service Group 1	1 space per 75 m ²	13
	Retail-Service Group 2	1 space per 50 m ²	20
City of Vancouver	Commercial - Office and Retail Use	1 space per 100 m ² (up to 300m ²), 1 space per 50m ² for additional	17
City of New Westminster	Retail or personal service establishments	1 space per 50 m ²	20
City of Burnaby	Retail Stores	1 space per 28 m ²	36
City of Surrey	Retail Store	2.75 spaces per 100 m ² (less than 372 m ²)	N/A
		3 spaces per 100 m ² (between 372 m ² and 4,645 m ²)	30
		2.5 spaces per 100 m ² (greater than 4,645 m ²)	N/A
City of Richmond	General Retail	3 spaces per 100 m ²	30
City of Delta	Retail or rental of motor vehicles	3 spaces per 100 m ²	30
City of Port Moody	Commercial buildings	1 space per 37 m ²	27
City of Coquitlam	Commercial	1 space per 40 m ²	25
City of Maple Ridge	Retail or personal service	1 space per 30 m ²	33
City of Pitt Meadows	Retail Use	1 space per 30 m ²	33
City of Langley	Retail Store	3 spaces per 93 m ²	32
Township of Langley	Retail stores, service establishments, ...	1 space per 20 m ²	50

NOTE: ALL PARKING RATES ARE BASED ON THE LATEST MUNICIPAL BYLAWS AS OF MARCH 2018

All three North Shore municipalities (District of West Vancouver, District of North Vancouver, City of North Vancouver) have two parking requirements based on the locations of the commercial developments. For the District of West Vancouver, the parking requirement for the Ambleside Centre Zone 1 & 2 (27 spaces per 1,000 square metres commercial land area) is only 50% of the other District's area (54 spaces per 1,000 squares metres commercial land area). It is noted that the parking requirement for the Ambleside Commercial Area have the 5th lowest parking rate provided, meaning the relatively lower number of required parking space per commercial floor area.

Except the City of Surrey and City of Vancouver having parking requirements for different land use sizes, parking requirements for all other reviewed BC municipalities are calculated with a fixed rate to the determined commercial land use space (Gross Floor or Leasable Area). The parking rates ranged from 13 spaces (City of North Vancouver) to 54 spaces (District of West Vancouver) per 1,000 square metres of commercial land area.



6.0 Comparison with Similar Studies

Similar recent parking studies were identified and provided in **Table 6.1**, in order to compare the results with this study with results from other studies in commercial areas.

Table 6.1: Comparison Table of Parking Utilization Results for Similar Recent Parking Studies

Study	Survey Details	Findings
Downtown Parking Study, District of Squamish (ISL, 2017)	Survey conducted : - Sat Sept 2, 2017 (Labour Day Long Weekend, 1100 to 1700 hours) - Thurs Sept 14, 2017 (900 to 1100, 1200 to 1400, 1500 to 1700 hours)	Downtown Commercial Area Utilization - 68% utilized during the weekday - 75% utilized during the long weekend Parking Duration / Turnover - 85th Percentile was less than 1.5 hours - 72% parked less than 1 hour during weekday - 83% parked less than 1 hour during long weekend
Lynn Creek Town Centre Parking Study, District of North Vancouver (ISL, 2017)	Surveys conducted : - Thurs Sept 21, 2017 (1000 to 1200, 1900 to 2100 hours) - Sat Sept 23, 2017 (1000 to 1200, 1900 to 2100 hours)	- 81% utilized during Weekday AM - 45% utilized during Weekday Evening - 45% utilized during Weekend AM - 38% utilized during Weekend Evening
Edgemont Traffic and Parking Assessment, District of North Vancouver (Urban Systems, 2014)	Survey conducted : - Sat Oct 19, 2013 (1030 to 12:30 hours) - Wed Oct 23, 2013 (1030 to 1230, 1500 to 1700 hours)	- 94% utilized during Saturday - 80% utilized during weekday morning - 75% utilized during weekday afternoon

The *Downtown Parking Study* for the *District of Squamish* was completed by ISL in September 2017. The study area included a main downtown commercial area, where parking duration / turnover (license plate survey) survey was conducted. The remaining area was mostly residential (with only utilization survey conducted). The parking utilization during the peak hours were slightly lower than what was observed in the Ambleside Commercial Area. The parking duration / turnover survey results showed similar results with approximately 70 to 85% of total surveyed vehicles parked in the 2-hour limit parked for less than 1 hour.

The *Lynn Creek Town Centre Parking Study* for the District of North Vancouver was also completed by ISL in September 2017. The study included weekday and weekend utilization surveys for an area containing both commercial and residential land uses. The highest parking utilization was observed during the weekday AM peak hour mainly due to residential parking and major land use staff parking demands (District Yards Building). All other surveyed periods were below 50% utilized.

Parking survey results from the *Edgemont Traffic and Parking Assessment* for the District of North Vancouver prepared by Urban Systems in 2014 were also extracted. Slightly lower utilization was observed during the weekday, compared to the Ambleside survey, with 80% during the weekday AM and 75% during the weekday PM peak hours.



7.0 Parking Demand Forecasting

7.1 Annual Parking Demand Growth Rate

The 2018 Ambleside parking utilization survey results were compared with other previous parking studies in the similar study area and the comparison finding was summarized in **Table 7.1**.

Table 7.1: Comparison of Ambleside Parking Utilization Survey Results

Time Period	Percent Utilized - Combined			
	Oct 2014 (1,701 Spaces)	Aug-Sept 2015 (1,449 Spaces)	Apr 2018 (1,768 Spaces)	Sept 2018 (1,849 Spaces)
Parking Utilization				
8:30 - 10:00am	55%	58%	23%	35%
10:00 - 11:30am	67%	70%	67%	66%
12:30 - 2:00pm	74%	74%	76%	72%
3:00 - 4:30 pm	68%	67%	66%	63%

Comparing the latest 2018 survey results (both April and September) for this study with the 2014 and 2015 parking utilization survey results from the previous parking studies for the District, it was found that the parking utilization rates for each time period were generally similar and stable over the last few years.

Although the number of surveyed parking spaces were different due to the changes in study areas, excluding the early morning survey, it was noted that the maximum change in utilization from 2014 to 2018 was less than 5%. It was noted the early morning survey (8:30 to 10am) was lower (35%) in 2018 when compared to the 2014 and 2015 surveys (55 to 58%). As the peak parking utilization rates was identified at the early afternoon survey period (12:30 to 2pm), the lower utilization rate from the early morning survey do not affect the parking analysis and conclusions. **Therefore, parking demand will likely stay the same within the Ambleside Commercial Area, and any changes in parking demand will be primarily due to future new developments.**

7.2 Anticipated Future Developments

In order to predict and forecast the future parking condition and demand within the area, the anticipated land-use changes were identified. Based on the information as provided by the District, three major developments are anticipated in the area:

- **The Residences on Marine (1327 Marine Drive)**
 - Approximately 16 residential units
 - About four commercial / retail units with an estimate of 5,200 square feet (sq. ft.) Gross Floor Area (GFA) in total
- **Grosvenor Ambleside (1355 and 1327 Bellevue Avenue) [Partially Completed]**
 - Approximately 98 residential units
 - Commercial / Retail / Restaurant
 - Earls Restaurant, Heirloom Vegetarian Restaurant combined with Meinhardt Fine Foods (Specialty Market) and other commercial (office) / retail 42,800 sq. ft. GFA in total, including 19,200 sq. ft. GFA for Phase 2.
- **Shoppers Drug Mart (1583 Marine Drive)**
 - Expected 11,700 sq. ft. GFA, resulting in a net increase in 5,000 sq. ft.



It is noted that the number of residential dwelling units for both The Residence on Marine and Grosvenor Ambleside were estimated from the development websites. At the time of the September 2018 survey, the Grosvenor Ambleside development had been partially completed Phase 1 commercial and residential, including underground parking facility (private resident and public customer parking).

In addition, the District has also indicated that specific sites were identified within the Ambleside Area to be considered as the potential locations for public parking capacity inclusion / upgrades or future parkades. These sites with the appropriate locations and existing number of parking spaces are summarized as:

- **Tennis Court** (southeast quadrant of the Marine Drive and 13th Street intersection): 50 stalls
- **14th Street Site** (west side of 14th Street between Marine Drive and Clyde Avenue): 20 stalls
- **Fresh Street Market** (southwest quadrant of Marine Drive and 16th Street intersection): 82 stalls
- **Hollyburn Funeral Home** (northwest quadrant of the Marine Drive and 18th Street intersection): 18 stalls
- **Shopper's Drug Mart** (northeast quadrant of the Marine Drive and 16th Street intersection): 20 stalls
- **West Van Florist** (north side of Marine Drive, west of 18th Street intersection): 18 stalls
- **Masonic Hall** (north side of Bellevue Avenue between 17th Street and 18th Street): 24 stalls

7.3 Sub-Area Survey Results

To effectively determine the parking supply / demand forecast, the Ambleside Commercial Area was subdivided into three Sub-areas, including:

- **Sub-Area 1 (East):** Bounded by 13th Street (west), 14th Street (east), Clyde Avenue (north), and Bellevue Avenue (south), including on-street parking on both sides of 14th Street as well as The Residence on Marine, Grosvenor Ambleside developments and the Tennis Court potential parkade site.
- **Sub-Area 2 (Central):** Bounded by 14th Street (west), 16th Street (east), laneway north of Clyde Avenue (north), and Argyle Avenue / John Lawson Park (south), including the on-street parking on both sides of 16th Street and the 14th Street potential parkade site.
- **Sub-Area 3 (West):** Bounded by 16th Street (east), 19th Street (west), laneway north of Marine Drive (north), and John Lawson Park / Bellevue Avenue (south), including the Fresh Street Market potential parkade site.

These sub-areas can be seen in **Figure 7.1**. The parking utilization survey results for both on-street, public off-street and private off-street, sub-divided by sub-areas, has also been discussed in the following sections.

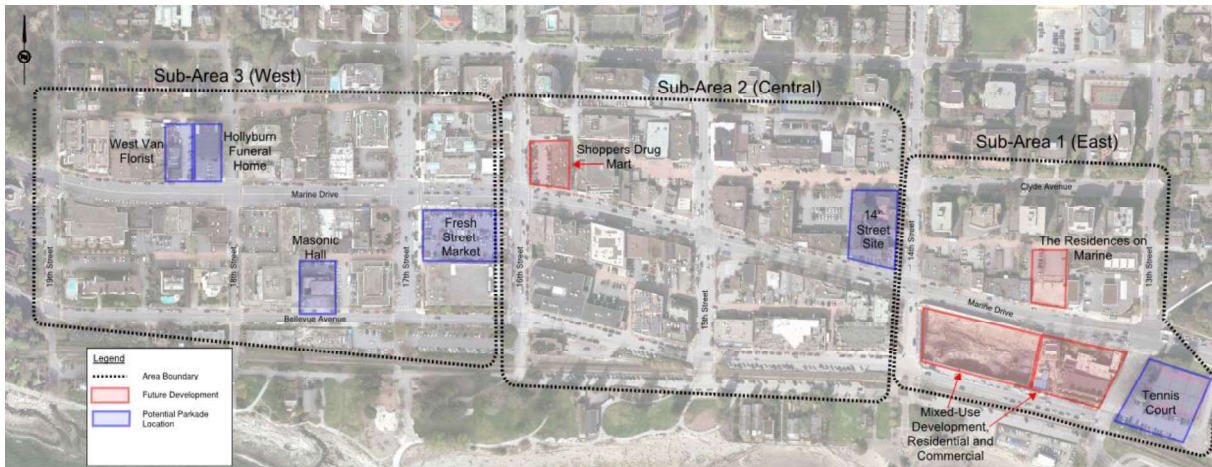


Figure 7.1: Ambleside Parking Study Sub-Areas, Future Developments, and Potential Parkade Locations

On-Street and Public Off-Street (Table 7.2)

It was found that the average on-street and public off-street parking utilization rates for the entire parking study area ranged from 41% to 86% and also determined as 71% for all study periods. The parking utilization rates were above 90% for Sub-areas 2 (Central) during the peak hour (starting 12:30pm). The utilization rates were also higher than 85% during the 10:00AM survey period for Sub-areas 2 (Central) and 3 (West). In general, the parking utilization rates are the highest in the Sub-area 2 (Central) and the lowest in the Sub-area 1 (East).

Table 7.2: On-Street and Public Off-Street Parking Utilization Survey Results – By Sub-Area

Location	Capacity	8:30am		10:00am		12:30pm		3:30pm		Average Spaces Utilized	Average Percent Utilization (%)
		Spaces Utilized	Percent Utilized (%)	Spaces Utilized	Percent Utilized (%)	Spaces Utilized	Percent Utilized (%)	Spaces Utilized	Percent Utilized (%)		
Sub-Area 1 (East)	172	75	44%	106	62%	133	77%	111	65%	106	62%
Sub-Area 2 (Central)	321	116	36%	286	89%	298	93%	251	78%	238	74%
Sub-Area 3 (West)	273	125	46%	236	86%	230	84%	214	78%	201	74%
Total	766	316	41%	628	82%	661	86%	576	75%	545	71%

Private Off-Street (Table 7.3)

The private off-street parking was generally less utilized with the average utilization rates having an range of 31% to 63% for the entire parking study area and 50% for all study periods. Sub-area 2 (Central) had the highest private off-street parking utilization rate of 66% during the peak hour (starting from 12:30pm). It was noted that the parking utilization rate was the highest for the Sub-area 2 (Central) and the lowest for the Sub-area 1 (East).

Table 7.3: Private Off-Street Parking Utilization Survey Results – By Sub-Area

Location	Capacity	8:30am		10:00am		12:30pm		3:30pm		Average Spaces Utilized	Average Percent Utilization (%)
		Spaces Utilized	Percent Utilized (%)	Spaces Utilized	Percent Utilized (%)	Spaces Utilized	Percent Utilized (%)	Spaces Utilized	Percent Utilized (%)		
Sub-Area 1 (East)	129	29	22%	49	38%	72	56%	42	33%	48	37%
Sub-Area 2 (Central)	438	141	32%	248	57%	291	66%	237	54%	229	52%
Sub-Area 3 (West)	516	169	33%	288	56%	316	61%	303	59%	269	52%
Total	1083	339	31%	585	54%	679	63%	582	54%	546	50%



7.4 Residential Parking Impacts

The majority of land uses in the Ambleside area, are commercial (retail or office); however, a few residential buildings and future developments are found within the study area, such as the anticipated developments along Marine Drive in Sub-area 1 (East) - The Residence on Marine and Grosvenor Ambleside. The parking requirement for the residential portion in the buildings/developments will be determined from the number of dwelling units, not floor area. As mentioned in Section 2.2 of this report, resident parking is mainly assigned and separated from the commercial parking area. Although some residential visitor vehicles may be shared with the commercial parking area or use the nearby on-street parking; the residential visitor parking demand will mainly occur during the weeknights and weekends (not conflicting with commercial peak hours). Therefore, the residential parking demand/supply is not included in the parking demand/supply forecasting for the weekday peak periods.

7.5 Parking Demand Forecasting Model

Every new development or redevelopment will require private off-street parking supply as specified in the *District's Zoning Bylaw*; however, in some occasions, the Bylaw's parking requirement may not fully satisfy the future parking demand. In order to estimate the additional public (on-street and off-street) parking demand due to new development and/or changes in land use, ISL utilized the parking inventory and parking survey results to develop a **Parking Demand Forecasting Model** to determine the public parking demand within the Ambleside Commercial Area.

Parking Demand Forecasting Flowchart

To undertake the parking demand forecasting, the process could be summarized in three stages:

- Data Collection;
- Calculating Observed Parking Demand; and
- Forecasting / Applying Parking Demand Ratio.

For better illustration of the above procedure, a flow chart has been developed (**Figure 7.2**) and the details are discussed in the following sections.

Parking Demand Ratio

The number of private off-street parking spaces are directly proportional to the retail / commercial land-use area, i.e. GFA. It is assumed that parking demand within the Ambleside Commercial Area is mainly driven by retail / commercial land use. Based on the District's *Zoning Bylaw No. 4662*, one parking space is required for 37 sq. m. (or 400 sq. ft.) GFA of commercial use, see **Formula 1**.

$$\text{Formula 1: Existing Parking Requirement (Bylaw)} = \text{Commercial GFA} \times \left(\frac{1 \text{ space}}{400 \text{ sq. ft. GFA}} \right)$$

Employers and employees are encouraged to park their vehicles in the designated staff parking stalls for their businesses while the customer vehicles are parked on the assigned private off-street parking stalls. However, due to various reasons (insufficient parking supply, convenience, inadequate wayfinding etc.), employers/employees and customers may park their vehicles at the nearby on-street parking spaces and public off-street parking lots. Therefore, the combined parking demand for a development site is determined from how many vehicles parked within the private off-street parking lot designated for the development site as well as the on-street parking and public off-street parking lots nearby the development site.

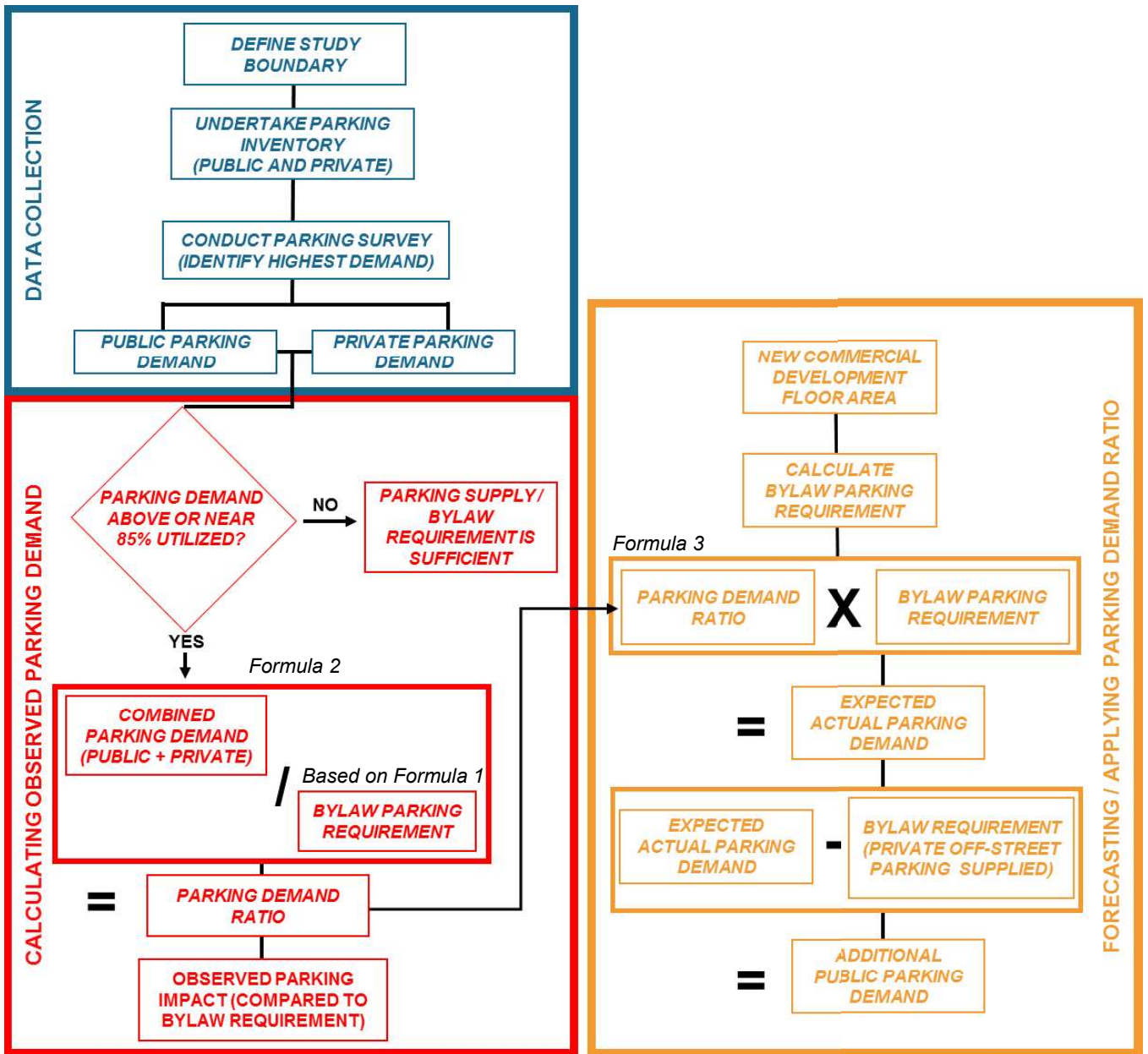


Figure 7.2: Parking Demand Forecasting Flow Chart



Parking Demand Ratio is calculated by taking the private off-street parking capacity (from the latest inventory survey) and divided by the combined (private off-street and public on-street/off-street) parking demand in the peak period (from the latest utilization survey). **Table 7.4** shows the parking demand ratios for each Sub-area as well as the Ambleside Commercial Area overall.

Table 7.4: Combined Parking Demand vs. Private Off-Street Parking Capacity – Parking Demand Ratio

	Sub-Area 1 (East)	Sub-Area 2 (Central)	Sub-Area 3 (West)	Total
Combined Highest Demand	205	589	546	1,340
Private Off-Street Parking Capacity	129	438	516	1,083
Parking Demand Ratio	1.59	1.34	1.06	1.24

The parking demand ratios provide an estimate for the number of on-street and public off-street parking spaces required above the off-street requirement (based on land use statistics) in order to satisfy the total parking demand. This parking demand ratio can then be applied to future development in the study area to determine the estimated parking demand for the development; therefore, the actual parking demand for a proposed development is approximately 1.24 times the District’s Zoning Bylaw requirement – an additional 24% parking demand would require the utilization of public parking (on-street and off-street). Although there are different parking demand ratios for three sub-areas, a single parking demand ratio is applied for further analysis. To simplify the analysis, the **Parking Demand Ratio** was rounded up to **1.25** in this study, see **Formula 2**.

$$\text{Formula 2: Actual Parking Demand} = \text{Existing Parking Requirement (Bylaw)} \times \text{Parking Demand Ratio}(1.25)$$

7.6 Parking Demand Forecasting for Sub-Area 1 (East)

Two future developments were anticipated within the Sub-area 1 (East):

- Grosvenor Ambleside – Phase 2 (1355 and 1327 Bellevue Avenue)
- Residences on Marine (1327 Marine Drive)

Since it is assumed that resident and residential visitor parking will be satisfied on-site and will have minimal impact during peak hours, impacts to on-street and public off-street parking were not considered for the residential portion. Moreover, public on-street and off-street parking time restrictions will also limit long-term use of residential parking. Retail, restaurant, and office GFA values were estimated based on available information about the proposed developments. According the District’s *Zoning Bylaw*, for commercial land use only, the required number of off-street parking spaces would be 48 stalls for the Grosvenor Ambleside (Phase 2) Development and 13 stalls for the Residences on Marine Development.

$$\text{Grosvenor Ambleside: } 19,200 \text{ sq. ft. GFA} \times \left(\frac{1 \text{ space}}{400 \text{ sq. ft. GFA}} \right) = 48 \text{ Spaces}$$

$$\text{Residences on Marine: } 5,200 \text{ sq. ft. GFA} \times \left(\frac{1 \text{ space}}{400 \text{ sq. ft. GFA}} \right) = 13 \text{ Space}$$



Based on the estimated Parking Demand Ratio, it is expected that the actual parking demand could be 1.25 times the calculated parking requirements. Therefore, the proposed Grosvenor Ambleside (Phase 2) development (commercial portion) is expected to require 60 stalls (48 x 1.25) during the peak hour, while the Residences on Marine development (commercial portion) is expected to require 16 stalls (13 x 1.25). Assuming that the on-site parking spaces are fully utilized during the peak hours, a total of 15 (60 - 48 + 16 - 13) additional on-street or public off-street parking spaces would be needed to satisfy the estimated demand, see **Formula 3**.

Formula 3:

$$\text{On - Street Parking Demand} = \text{Commercial GFA} \left(\frac{1 \text{ space}}{400 \text{ sq. ft. GFA}} \right) \times 0.25$$

Within the Sub-area 1 (East), the overall parking utilization for on-street and public off-street (tennis court parking lot) was noted to be the highest at 77% during the peak hour (12:30pm to 1:00pm). Most public on-street parking within the area was at or above 80% utilized, except for the public parking at the tennis court (east side of 13th Street between Bellevue Avenue and Marine Drive) which was surveyed as 40% utilized during the peak hour and did not exceed 62% utilized during the survey.

It is expected that the estimated 15 additional parking demand could be satisfied by the available spaces in the underutilized public parking, especially since they will be adjacent to the future developments. It is assumed that due to the reasons stated in the previous section that the existing off-street parking utilization rate will remain the same. The expected resulting parking utilization rate for on-street and public off-street parking in Sub-area 1 (East) will become 86% utilized after the opening of the two future developments.

Assuming, similar parking rates would be applied for new developments within the area and applying **Formula 4**, approximately **62,400** sq. ft. of new commercial GFA (two previously discussed future developments included) could be accommodated before the public parking reaches 100% capacity, assuming the on-site parking capacity is also utilized.

Formula 4:

$$\text{OR Commercial GFA} = \left(\frac{\text{On - Street Parking Demand}}{0.25} \right) \times \left(\frac{400 \text{ sq. ft. GFA}}{1 \text{ space}} \right)$$

7.7 Parking Demand Forecasting in Sub-Area 2 (Central)

Only one future development is anticipated within the Sub-area 2 (Central). Based on the net increase in GFA of 5,000 sq. ft. and the parking demand ratio of 1.25, it is estimated that a total of 16 (13 x 1.25) additional spaces would need to be accommodated through on-street and public off-street parking. The on-street and public off-street parking utilization is generally high near the development site.

- Shoppers Drug Mart (1583 Marine Drive)

$$\text{Parking Requirements} = 5,000 \text{ sq. ft. GFA} \times \left(\frac{1 \text{ space}}{400 \text{ sq. ft. GFA}} \right) = 13 \text{ Space}$$

Sub-area 2 (Central) is not expected to have any new major developments in the future; however, the potential parkade location located at 14th Street / Clyde Avenue. It was identified that this area could eventually be redeveloped; however, there is no timeline determined.



During the peak hour, it was noted that the on-street and public off-street parking utilization was at 93% during the peak hour. This parking utilization means that approximately 298 of 321 total public spaces were occupied (only 23 available spaces left). Using similar methodology in Sub-area 1 (East), additional commercial GFA was estimated that would cause 100% utilization within this area.

Assuming, similar parking rates would be applied for new developments within the area and utilizing *Formula 4*, approximately **35,000** sq. ft. of new commercial GFA could be accommodated before the public parking reaches 100% capacity, assuming the on-site parking capacity is also utilized. It is assumed the available on-street and public parking supplies will remain the same and new developments will not remove any on-street and public off-street parking spaces.

7.8 Parking Demand Forecasting in Sub-Area 3 (West)

Sub-area 3 (West) is not expected to have any new major developments in the future; however, the potential parkade could be located at Fresh Street Market, Masonic Hall, Hollyburn Funeral Home, and West Van Florist. It was identified that this area could eventually be made to accommodate additional capacity; however, there is no timeline determined.

During the peak hour, it was noted that the on-street and public off-street parking utilization was at 84% during the peak hour. This utilization means that approximately 230 of 273 total public spaces were occupied (only 43 available spaces left).

Assuming, similar parking rates would be applied for new developments within the area and utilizing *Formula 4*, approximately **68,000** sq. ft. of new commercial GFA could be accommodated before the public parking reaches 100% capacity, assuming the on-site parking capacity is also utilized. It is assumed the available on-street and public parking supplies stay the same and new developments will not remove any on-street and public off-street parking spaces.

7.9 Sensitivity Analysis

In addition to the future developments as indicated in the previous sections, the potential impacts to public parking utilizations within the Ambleside area were also reviewed. Applying the similar forecasting methodology previously discussed and assumed that the new on-site parking spaces are fully utilized during the peak hours, the surplus or shortfall of public parking could be determined using different commercial development growth scenarios.

Figure 7.3 shows the expected public parking utilization for varying commercial development growth scenarios within each Sub-area. In addition to the parking supply capacity (100% utilized), the ideal utilization range (75 to 85% capacity), and the maximum ideal utilization (85% capacity) was also provided. It is assumed that with 15% of spaces available at any given time in any Sub-area, the user will be able to find parking in the area nearby.



Public Parking Utilization After Future Commercial Development

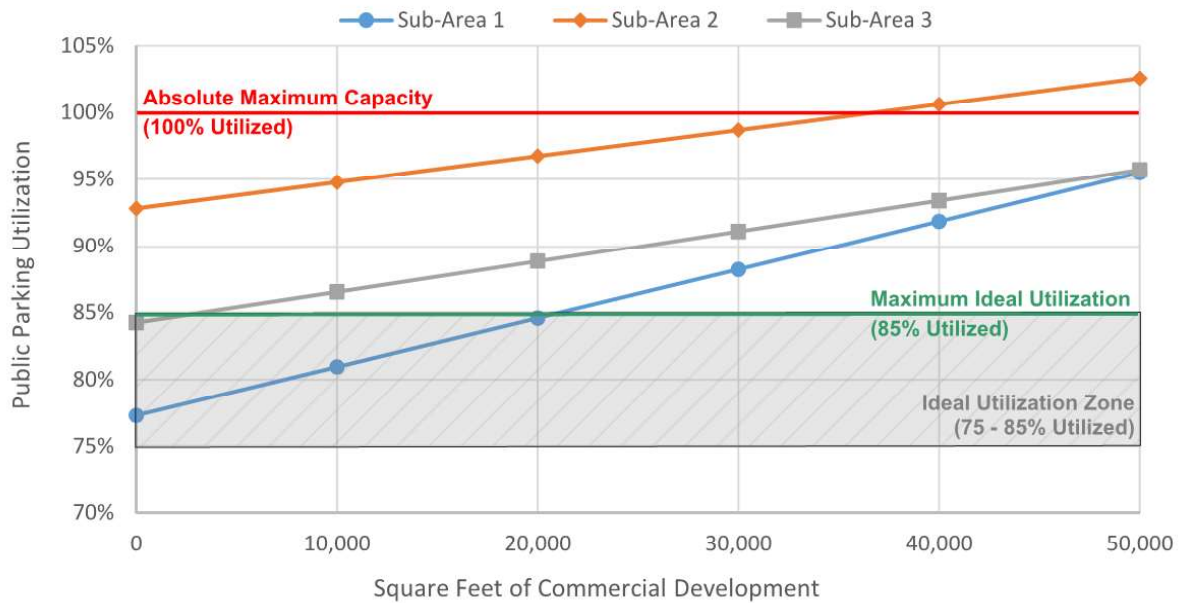


Figure 7.3: Public Parking Utilization after Future Commercial Development Scenarios

For example, a new commercial development of 30,000 sq. ft., GFA within the Sub-area 3 (West) (x-axis), the corresponding public parking utilization is expected to be 91%. Alternatively, assuming the additional proposed development of 30,000 sq. ft, GFA within the Sub-area 2 (Central), the public parking capacity is expected to be 99% utilized.

The breakdown for the parking demand/supply forecasting for the additional commercial development (for each 10,000 sq. ft. GFA increments) in each Sub-area can be seen in **Table 7.5** (for the Sub-area 1 (East)), **Table 7.6** (for the Sub-area 2 (Central)) and **Table 7.7** (for the Sub-area 3 (West)) with the columns labeled as:

- New Commercial GFA – not including the future developments discussed in the previous section, zero (0) indicates the existing condition.
- Estimated Parking Demand - the off-street parking requirement with the parking demand ratio applied.
- Public Parking Demand - the estimated parking demand minus the parking demand satisfied by the provided on-site parking (private off-street parking requirement).
- Resulting Public Parking Utilization – parking utilization rates with new commercial development (as also shown in **Figure 7.3**).
- Parking Surplus / Shortfall (number of parking stalls) for both 100% (physical) and 85% (maximum ideal) of the existing on-street and public off-street capacity - positive values indicate that there is a surplus of public parking, whereas the negative value indicated a shortfall of public parking (insufficient parking supply). The shortfall number (negative value) indicates the number of public parking stalls needed to satisfy the expected parking demand during the peak hour.



It is noted that for Sub-area 1 (East), new commercial GFA of over 62,400 sq. ft. (in addition to the anticipated Residences on Marine and Grosvenor Ambleside Phase 2) could be accommodated before reaching 100% utilization; however an additional 20,000 sq. ft. GFA commercial area will reach the maximum ideal utilization (85%). As discussed previously, Sub-area 2 (Central) could accommodate 35,000 sq. ft. of commercial GFA while Sub-area 3 (West) could accommodate over 68,000 sq. ft. of commercial GFA before reaching 100% utilization. However, in order to achieve an 85% maximum ideal utilization, Sub-area 2 (Central) requires additional parking provisions (25 parking spaces) even without any new commercial GFA and Sub-area 3 (West) would require additional public parking after any development is implemented.

Table 7.5: Sub-Area 1 (East) Commercial Development Growth Scenarios

New Commercial GFA	Private Off-Street Parking Requirement	Estimated Parking Demand	Public Parking Demand	Resulting Public Parking Utilization	Parking Surplus / Shortfall	
					Physical Capacity 100%	Max Ideal Capacity 85%
0	0	0	0	77%	60	60
10,000	25	31	6	81%	33	7
20,000	50	63	13	85%	27	1
30,000	75	94	19	88%	20	-6
40,000	100	125	25	92%	14	-12
50,000	125	156	31	95%	8	-18

Table 7.6: Sub-Area 2 (Central) Commercial Development Growth Scenarios

New Commercial GFA	Private Off-Street Parking Requirement	Estimated Parking Demand	Public Parking Demand	Resulting Public Parking Utilization	Parking Surplus / Shortfall	
					Physical Capacity 100%	Max Ideal Capacity 85%
0	0	0	0	93%	23	-25
10,000	25	31	6	95%	17	-31
20,000	50	63	13	97%	11	-38
30,000	75	94	19	99%	4	-44
40,000	100	125	25	101%	-2	-50
50,000	125	156	31	103%	-8	-56

Table 7.7: Sub-Area 3 (West) Commercial Development Growth Scenarios

New Commercial GFA	Private Off-Street Parking Requirement	Estimated Parking Demand	Public Parking Demand	Resulting Public Parking Utilization	Parking Surplus / Shortfall	
					Physical Capacity 100%	Max Ideal Capacity 85%
0	0	0	0	84%	43	2
10,000	25	31	6	87%	37	-4
20,000	50	63	13	89%	31	-10
30,000	75	94	19	91%	24	-17
40,000	100	125	25	93%	18	-23
50,000	125	156	31	96%	12	-29



8.0

Parking Issue Identification and Improvement Measures

8.1 Identified Parking Issues

During a typical weekday afternoon, high parking demands were identified within the Ambleside Commercial Area, particularly the Sub-area 2 (Central) and the Sub-area 3 (West). During the peak period (11:30pm to 2:00pm), it was observed that many vehicles travelled along Marine Drive to find vacant on-street parking spots and sometimes circling and waiting for stalls to become available. The common two-hour parking limit also increases parking durations and reduces the number of parking turnovers. Tourists or people unfamiliar with the area may not be aware of more available parking stalls located one block away or parking spaces located in the rear lane, specifically designated for their destinations. It is expected any future developments in the area will increase the on-street and public off-street parking demand.



For the Sub-area 1 (East), specifically near the Grosvenor Ambleside Development, the surveyed parking utilization was noted to be below the maximum ideal parking utilization limit (85% utilized). However, due to site construction work during the parking survey, traffic operations and parking restrictions in the area was affected as well as the parking utilization results. It is expected that the on-street parking capacity will increase; however, the Grosvenor Ambleside Development (Phase 2) will also generate and attract many on-street parking, once the development is fully built-out.

Based on the sensitivity analysis in Section 7.9, the analysis results indicated the current parking supply would marginally accommodate the existing parking demand in the Sub-area 3, while Sub-area 2 requires additional parking supply to achieve the 85% Maximum Ideal Utilization. Therefore, both short-term and long-term improvement measures to increase parking supply should be considered.

8.2 Short-term Improvement Measures

To increase the parking supply in the Ambleside Commercial Area, the development of a parking structure could take some time to plan and implement; therefore, some short-term measures could be considered in order to manage current and future on-street and public off-street parking demand. The objective of short-term improvements is to maintain efficient use of public parking facilities while maintaining an 85% parking utilization. Short-term improvements that could be considered include:

- Increase utilization of private off-street parking through:
 - Provide area map to show the off-street private parking lots on website.
 - Improve way-finding signage within the study area to lead customers to off-street parking lots.
 - Encourage businesses owners and employees to remind customers about the locations of their own off-street parking.
- Generate shared-parking opportunities amongst private property owners:
 - Encourage businesses to share off-street private parking so that customers can park in a single location for several nearby destinations.





- Increase parking turnover in the popular areas by reducing time limits, such as:
 - Reduce on-street time limits, such as from 2-hour to 1-hour, 1-hour to 30-min.
 - Based on the parking survey, 80% of parking within the 2-hour parking limit was actually parked for less than one hour.
 - Longer time limit parking spaces to be provided outside the prime area with corresponding signs.
- Enforce parking regulation during peak periods by District’s Bylaw staff, especially at the locations with the proposed reduction in on-street parking time limits.
- Encourage alternative modes with improving public transit, walking and cycling conditions to expand the range of destinations currently serviced by a parking facility and reduce automobile trips.
- Consider pay parking with the consideration of (discussion in *Section 8.6*):
 - Parking fee be adjusted to maintain an 85% utilization.
 - Encourage short-term parking and higher turnover.
 - It is expected that the utilization of private off-street parking lots will be increased to avoid parking fee on on-street or off-street public parking.



8.3 Parking Structure Review

As indicated in Section 7.2 of this report, the District has indicated that seven specific sites were identified within the Ambleside Area to be considered as the potential locations for public parking capacity inclusion / upgrades or future parkades. These sites include Tennis Court, 14th Street Site, Fresh Street Market, Hollyburn Funeral Home, Shopper’s Drug Mart, West Van Florist, and Masonic Hall. Based on review of the existing site area, only the first three sites were considered for further reviewed for the development of parking structures.

According to the parking survey results and analysis, the potential impacts of the three proposed sites for the future parkade development were reviewed and is summarized as follows:

- **Tennis Court** (southeast quadrant of the Marine Drive and 13th Street intersection): As parking surplus was found in the Sub-area 1 (East) and the site is located at the eastern edge of the Ambleside area, it is expected that the provision of a parkade at this location will have limited improvements to the potential parking issues in Sub-areas 2 and 3.
- **14th Street Site** (east side of 14 Street, between Marine Drive and Clyde Avenue): The Sub-area 2 (Central) requires the additional parking supply; and this site could potentially alleviate the majority of parking demand found around Marine Drive.
- **Fresh Street Market** (southwest quadrant of Marine Drive and 16th Street intersection): As the site is located at the centre of the Ambleside area and along Marine Drive, it is expected that the provision of a parkade at this location will greatly improve the potential parking issues. However, as the existing Fresh Street Market is the major grocery store in the area, the site redevelopment to a parkade will affect the retail business as well as attractiveness of the residents and tourists to the Ambleside Commercial Area. Redevelopment of this site is not likely to occur in the near future due to recent improvements.



Based on the parking utilization review, it is found that the Tennis Court is not essential and appropriate location for the future multi-level parkade structure. Due to existing location for a major grocery store, it is not recommended that the Fresh Street Market site be considered for redevelopment.

The 14th Street Site could be considered priority through the redevelopment process. Although it is not strategically located near both Sub-areas 2 and 3, the site is located long Marine Drive (where there is high parking demand) and also near Sub-area 1 and the Ambleside Grosvenor development that is expected to generate significant additional parking demand in the future.

Figure 8.1 shows the sketch of a typical level plan for a potential structure for the 14th Street site. Due to lots of unknown parameters, including the land price, it is hard to determine the detailed cost estimate for the future parking structure as well as on-going costs (operations and maintenance). With the high-level estimates, the construction cost for a parking structure to fit 14th Street site could require \$25 Million to \$30 Million.

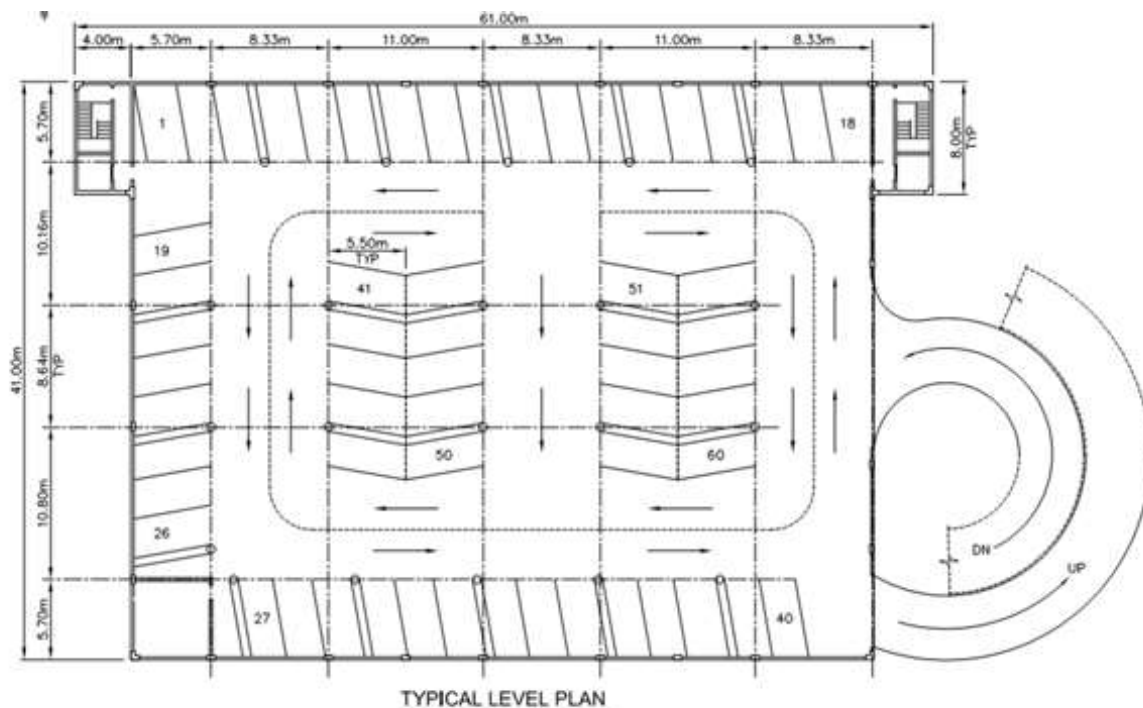


Figure 8.1: Typical Level Plan for Potential Parking Structure for the 14th Street Site

The 14th Street Site could be given priority for the construction of parkade or additional parking supply. The decision is dependent on willingness of land owners to further develop their property and interests of third parties / stakeholders.



In addition to constructing a potential parking structure, the District could also consider negotiating with developers the use of public parking spaces within new developments in Ambleside Commercial Area. It is possible to relieve parking demand hotspots using a smaller number of public parking spaces which could be integrated with the private parking for the new developments. District and the owners can agree to an arrangement for parking management.

Based on research and discussion with local architects and quantity surveyors, a typical parking stall within the North Shore area cost approximately \$45,000 to \$50,000.

8.4 Pay Parking vs. Free Parking

On-street parking is currently free-of-charge within in the Ambleside Commercial Area. It is expected that when on-street parking is free, there is little incentive for drivers to use alternative modes of transportation or utilize the available private off-street parking provided by businesses within the area. The District could consider high, medium or low fee structures that would have various impacts to parking and driver behavior (higher cost would likely lead to lower parking utilization and shorter parking durations); however, a strategic approach could be implemented. With pay parking, rates could be strategically set to optimize parking facility use, meaning prices are set for specific locations and times in order to achieve an 85% utilization, and this is called performance-based pricing. Rates are typically structured to encourage short-term uses for central and high utilization area. As a result, encouraging longer-term parking to other locations (off-street and outside of the core area).

It is important to implement a system that has clear and easy to understand pay system in place. Rates can also be adjusted throughout the day or week to accommodate appropriate use during the evenings and weekends. Advanced payment methods are available that allow for flexibility in providing more convenient charging methods, and incorporate multiple rates changes throughout the day. An advanced parking system would also enable the District to monitor and observe duration and turnover information more effectively allowing for adjustments and management of the parking within the area.

Pay parking on the other hand would require increased bylaw enforcement and would require an installation cost and ongoing maintenance cost to maintain the system. The parking fee can somewhat offset the costs of implementing and maintaining the system. Changing the parking fee structure (from free-of-charge to pay parking) is not anticipated to have an impact of total trips to the area since it is designed to maintain 85% utilization on-street, not through deterring parking trips in the neighborhood but rather by encouraging more efficient use of the available parking. It is anticipated that the private off-street parking that is currently underutilized could be more effectively utilized because of the change. Wayfinding signage and other short-term improvement measures for visitors to the area could be implemented, encouraging the use of the private off-street parking.

Before considering implementing a pay parking system, a complete and detailed implementation program should be conducted, including identification of the pay parking structure, stakeholders and public consultation and even a pilot program in certain areas to understand and receive users' and business owners' feedback to ensure a pay parking system can be implemented effectively.

In summary, pay parking, using a performance-based pricing, is a method to more effectively utilize the valuable on-street parking, more easily monitor the on-street parking utilization, and collect revenue to improve enforcement, security, facility maintenance, marketing and other transit mode shift programs.



8.5 Discussion on Mode Share and New B-Line Bus Service along Marine Drive

In order to identify potential users of the parkade, the *Ambleside Parking Research Report* prepared by Mustel Group (December 2017) was reviewed. Based on the findings of the intercept survey, it was observed that 68% of people visiting Ambleside reside in the District (29% from Ambleside/Hollyburn area and 10% from the Dundarave area). Alternatively, 32% reside in other municipalities. It was estimated that 61% of visitors arrived in Ambleside with private vehicles. Of the people surveyed who drove, 31% were employers / employees in the area, 45% were residents and 22% were visitors. The remaining 39% arrived using alternative modes such as walking (26% walking and 12% by transit).

Additionally, it is expected that B-line bus service along Marine Drive could be integrated with a potential parkade structure. Implementation of the B-line service could have many potential impacts on parking within Ambleside.

- **Mode Shift:** B-Line could alleviate parking demand because of the convenience of taking the bus over driving a vehicle for people visiting Downtown Ambleside, leading to an overall mode shift. This improvement could potentially maintain ideal parking utilization along the high parking demand Marine Drive corridor.
- **Long Distance Transit Rider Parking:** B-line could also potentially increase long-term parking near the transit stops for people parking and getting on transit. In order to minimize the impact long-term parking on the on-street parking demand, other parking options and park-and-ride options outside of the Ambleside Commercial Area should be provided and well communicated to transit users. Long-term parking could also be factored into any parking structure implemented.

The 14th Street Site could potentially be integrated with the B-Line bus service since they are both located along Marine Drive.

8.6 Discussion on Other Factors Impacting Parking

In addition to future development affecting the parking demand, other external factors may influence it. It is found that significant changes in technologies that will not only influence driving behaviour but also people's parking behaviours. Technologies such as the provision of achievable Transportation Demand Management (TDM) measures, rapid transit, ride sharing and autonomous vehicles may lead to reductions in parking demand as people's transportation habits shift. Taking this into consideration, solutions to insufficient parking supply or excessive parking demand may become apparent, as new technologies are made available to achieve an optimal parking utilization (85% utilization).



9.0 Conclusion and Recommendation

9.1 Parking Survey Summary

- In the Ambleside Commercial Area, it was recorded a total of **1,768** available parking spaces, with 58% (1,024 spaces) private off-street parking and the remaining 42% (744 spaces) on-street and public parking stalls. The parking time limit restriction for over 90% (687 spaces) of the public parking stalls is 2-hour or longer.
- Parking duration survey in a Sub-area of the study area was undertaken and was found that approximately 80% of vehicles parked less than 1-hour and less than 5% parked 2-hour or longer.
- As an industry best practice, it is recommended to maintain an 85% parking utilization rate as the maximum ideal utilization in the study area.
- The highest parking demand was found around noon with over 75% overall combined parking utilization (including public and private parking spaces).
- The study area was sub-divided into three sub-areas (East, Central and West).
 - Sub-area 1 (East) has ample parking provision throughout the parking survey.
 - The public parking utilization for both Sub-areas 2 and 3 (central and west) were over 80% at 10 a.m. and at the noon periods, while the private parking utilization for these two Sub-areas were around 75% or less.

9.2 Parking Demand Forecasting

- The Bylaw's parking requirement may not fully satisfy the parking demand.
- The actual parking demand for an area is determined from the highest number of vehicles parked in both private and public parking spaces.
- Parking demand ratio is the proportion of the actual parking demand to the Bylaw required parking provision.
- Based on the findings from the parking survey, the overall parking demand ratio for the study area was estimated as 1.25, indicating a further 25% more parking spaces would be needed in the area compared to the Bylaw required parking supply.
- To achieve 100% capacity parking utilization,
 - Sub-area 1 (East) has surplus public parking for new developments up to 62,400 sq. ft.
 - Sub-areas 2 (Central) an additional 35,000 sq. ft. of new development could be accommodated.
 - Sub-area 3 (West) has surplus public parking for new developments up to 68,000 sq. ft.

9.3 Sensitivity Analysis

- Surplus or shortfall of public parking was determined using different commercial development growth scenarios and existing parking behaviour for existing commercial developments
- Considering the Max Ideal Capacity (85% Utilized):
 - Sub-area 1 (East) could accommodate additional 21,000 sq. ft. new commercial development before requiring extra public parking spaces
 - Sub-area 2 (Central) requires additional 25 public stalls to achieve the Max Ideal Utilization given the existing development
 - Sub area 3 (West) could not accommodate any additional development without providing extra public parking (at 84% utilization given existing development)



9.4 Possible Improvement Measures

Based on the study findings, the following recommendations have been provided in two categories; short-term and long-term improvement measures. Generally, short-term measures could be implemented in a short time frame or immediately, however, more internal review, public consultation and further studies will be required for long-term improvement measures.

- Short-term Improvement Measures
 - Increase utilization of private off-street parking.
 - Generate shared parking opportunities.
 - Increase parking turnover in the popular areas.
 - Enforce parking regulation during peak periods.
 - Encourage alternative modes.
 - Consider pay parking (potential long-term).
- Long-term Improvement Measures
 - Consider constructing a parkade structure at 14th Street Site to satisfy the parking demand for both Sub-areas 2 and 3.

9.5 Implementation Plan

This implementation plan provides an immediate plan for implementing recommendation presented in this report and actions that can be taken to improve the parking condition.

- Reduce on-street time limits
 - Existing parking restriction of 5-min, 15-min, and 1-hour to be retained.
 - Replace existing 2-hour parking restriction to 1-hour between 14th Street and 17th Street, but no modifications to the areas east of 14th Street and west of 17th Street.
 - Replace existing 3-hour parking restriction to 2-hour limit.
- Improve way-finding signs
 - Provide and install maps showing location and parking restriction for public parking spaces.
 - Install additional signage to indicate other public parking spaces.
- Increase parking enforcement
 - Increase bylaw parking enforcement personnel during the peak parking periods such as 10:00 am to 2:00 pm
- Encourage businesses to share parking
 - Identify and discuss with businesses that could consider shared parking.
- Consider collecting funding from property developers
 - Set up the CAC (Community Amenity Contributions) area and develop the relevant policy for funding the proposed parking structure
- Monitor parking demand and supply
 - Perform the same parking surveys, including parking utilization and parking duration survey) and the assessment, once every six months or one year.
 - Evaluate if the parking utilization for the off-street private lots have been affected.
 - Evaluate if the reduced parking restriction is effective and consider if the introduction of pay parking is required.
 - Set up a special task force to review the potential impact from the parking fee and the strategies for implementation.



Appendix A
Letter of Introduction







April 10, 2018

File: ##

Ambleside Parking Study

Dear Residents,

The District of West Vancouver (the District) is in the process of reviewing on- and off-street parking supply and demand within the Ambleside Village area. The objective of this review is to identify the existing parking conditions and determine how to best manage parking in the future.

In order to survey the parking supply and level of utilization of parking, the District has engaged the services of ISL Engineering and Land Services (ISL). Between April 10 and April 27, 2018, ISL will request your permission to allow access to your off-street parking facilities to record the number of vacant and occupied parking spaces. ISL will also be surveying public on-street parking spaces throughout the study area. Partial license plates of vehicle parked in public parking spaces may be recorded; however, this information will not be shared for any other purpose, and no other personal information will be recorded. The hours of these surveys will generally be on weekdays during the busiest morning, mid-day and evening periods.

Your cooperation will be greatly appreciated in helping the District complete this review in order to help develop future parking management strategies and improvements. If you have questions concerning any aspect of this study, please contact the undersigned District staff in the Roads & Transportation Department.

Thank you for your understanding and cooperation,

John Calimente
Transportation Planner
T: 604.921.2912
jcalimente@westvancouver.ca

cc: **Dispatch, Operations Centre**
DL: Construction Notices