



**Ambleside Mixed-Use Development,
1300 Block Marine Drive,
West Vancouver
Transportation Study
Revised Final Report**

Prepared for
Grosvenor Capital Corporation

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EXECUTIVE SUMMARY

Grosvenor Americas is proposing to rezone the 1300 block of Marine Drive in the Ambleside area of the District of West Vancouver in order to develop a mixed-use residential and commercial development. For the purposes of this study, we have modeled the replacement of all of the development on the block (including the police station) with approximately with approximately 44,000 square feet of street level retail and restaurant use and 88 residential units above.

All of this development is to be serviced by underground parking. The model assumes 314 parking spaces located on three levels of parking beneath the new buildings.

The analysis herein concludes that the projected impacts of the new development, net of existing uses on the site, will not have a material impact on the capacity of service levels of the existing road network.

The project is planned in two phases. Driveway access to Phase 1 will be limited to Bellevue Avenue. The Phase 2 component is modelled for completion in 2017. With the Phase 2 development, the parkade will be connected to Phase 1 and an additional right-turn entry only access driveway is proposed for 13th Street.

Existing peak period traffic in the Ambleside area generally operates within the capacity of the existing street system. The Marine Drive intersections at 13th, 14th, and 15th Streets operate with full traffic signal and at about two-thirds of capacity during the busiest traffic periods on weekday and Saturday afternoons. The stop sign controlled intersections on Bellevue Avenue at 13th, 14th, and 15th Streets generally operate with limited delay and queuing during peak traffic periods.

Future increases in peak period traffic are anticipated along the Marine Drive corridor in Ambleside as part of several other nearby development projects in West Vancouver either under construction or about to commence. Our analysis of these other projects indicates that potentially up to 10% increase in peak period traffic on Marine Drive can be anticipated by 2015, with a further 5-10% increase over the 10 years that follow to Year 2027. The existing road network in Ambleside is expected to be able to generally accommodate this background traffic growth with only relatively minor traffic signal timing adjustments required (i.e., introduction of an advance westbound Marine Drive signal phase at the 15th Street intersection).

The proposed redevelopment of the 1300 Block of Marine Drive is anticipated to generate a net additional vehicle traffic volume of approximately 22 two-way vehicles per hour during the morning peak traffic period, 98 two-way vehicles per hour during the weekday afternoon peak period, and 136 two-way vehicles per hour during the Saturday mid-day traffic period. This analysis nets out the existing traffic generated by the existing development on the 1300 Block including the police station and existing shops and services. Even during the busier traffic periods, the net traffic increase associated with the proposed development is limited to no greater than approximately 3 vehicles per minute.

The area road network is expected to be able to generally accommodate this net additional traffic associated with the 1300 Block redevelopment. The intersections of Marine Drive with both 13th Street and 15th Street will be effectively at capacity conditions. As a minimum, signal timing adjustments will be required to improve future traffic operation, i.e., the introduction of an advance westbound Marine Drive signal phase at the 15th Street intersection. Construction of left-turn bays on the both the eastbound and westbound Marine Drive approaches to the 15th Street intersection is another measure that will improve future traffic operation at this intersection; however, this will require the elimination of up to 8-10 curbside parking spaces. Our recommendation is that the westbound advance signal phase improvement be implemented and traffic conditions continue to be monitored to determine whether it necessary to proceed with the left-turn bay improvements.

The present configuration of the intersection of 13th Street and Bellevue Avenue is challenged by the presence of the adjacent at-grade rail crossing to the south and the offset between the Bellevue approach on the west side and the all-weather playing field parking lot access to the east. While the future traffic conditions capacity analysis indicates that this intersection will continue to operate within capacity to the future 2026 horizon year period, a reconfiguration of this intersection and the introduction of full traffic signal control is recommended to improve future conditions for the mix of vehicle, pedestrian, and cyclist traffic anticipated. A relocation of the existing rail crossing to a point approximately 65 metres to the east would allow the 13th/Bellevue to operate as a simple “T intersection” and enable better management of vehicle queues created by the occasional train movements through this area. This arrangement would require changes to the parking lot for the new Rutledge all-weather playing field (likely involving the removal of the existing tennis courts to make way for relocated parking, or alternatively, construction of a parking level below a raised tennis court surface), and negotiation with CN Rail and Transport Canada. The timelines and cost to undertake these improvements would be considerable and therefore we suggest this be considered as a longer term road improvement option. This recommended reconfiguration is independent and not a product of the proposed 1300 block development.

There are presently a total of 44 parking spaces on the 1300 Block site. The 1300 Block redevelopment has been modeled with 314 parking spaces located beneath the new buildings. The Zoning Bylaw parking requirement for the proposed uses calculates to 285 parking spaces. The additional parking spaces will be available to accommodate the anticipated higher residential parking demand generated by larger dwelling units (14 of the additional 29 spaces allotted to residential use) and it will also serve additional or latent commercial/ retail parking demand (15 of the additional 29 spaces allotted to commercial use).

The existing 24 parking spaces available for public use on Bellevue Avenue between 13th and 14th Streets will be increased to approximately 29 spaces in the future once the police station is relocated and parking spaces presently dedicated parking spaces for police vehicles are converted over to public use. Overall parking conditions in the Ambleside area will improve with the proposed new development on account of the increased number of on-street spaces on Bellevue Avenue.

The 1300 Block site is well suited as a sustainable transportation development. The planned mix of residential and commercial uses on the Marine Drive corridor is expected to result in significantly less vehicle traffic than if these uses were developed separately and away from Marine Drive.

Presently up to 30 transit buses per hour travel on this section of Marine Drive and recent bus priority improvements to eastbound Marine Drive (bus lane plus bus only signal phasing through the Marine Drive/Taylor Way intersection) have considerably improved transit efficiency in the area. The 1300 Block is also accessed by a number of bicycle routes including the recently created Spirit Trail walk/bikeway. The new development will be well equipped with bike storage facilities, including covered and secure bike rooms for resident and employee use, and outside bike racks in convenient locations for shorter term bike parking by visitors and customers. While there are presently no commercially operated car share vehicles in the area, the developer may consider the inclusion of two future car share vehicle parking spaces that can be accessed by future residents of the 1300 Block project and the community at large.

Cyclist volumes on Marine Drive represent less than 1% of the vehicle volumes, approximately 5% of the vehicle traffic on Bellevue and over 100% of the vehicle volume on Argyle Avenue. In addition to vehicle volumes, vehicle operating speeds are also higher on Marine Drive. Due to these factors we feel cycling amenity priority on Argyle would yield the highest return of cycling mode split increase by providing potential cyclists the perception of safety that they desire.

It is recommended that sharrows be painted onto the right eastbound lane of Marine Drive (existing lane width) in order to alert motorists that the lane is also used by cyclists. The alternative of providing additional lane width on Marine Drive to create a shared lane for motorists and buses to pass cyclists within the lane up against a lane of parked vehicles is not considered the safest option for cyclists. Instead using the existing width and adding sharrows is a perfectly appropriate treatment where the purpose would be to give the lane to the cyclist, and have the motorist temporarily slow down or use the adjacent eastbound travel lane for passing. The use of sharrows in this manner is particularly suitable for short distances such as the 1300 block of Marine Drive.

1. INTRODUCTION

1.1 Background

Bunt & Associates was retained by Grosvenor Capital Corporation (Grosvenor) to conduct a Transportation Impact Assessment for the proposed redevelopment of the 1300 Block of Marine Drive in the District of West Vancouver. The location of the development site is illustrated in **Exhibit 1**. The traffic Study Area is shown in **Exhibit 2**.

The 1300 Block site is located at the heart of the Ambleside neighbourhood. Marine Drive to the immediate north of the site is the major east-west arterial route and the main commercial corridor for West Vancouver. Ambleside Park with its sport playing fields, seawall and beach access, and marina and boat launch facility is located to the east and south of the 1300 Block site and is a major recreational centre for the District.

Grosvenor is proposing to redevelop the 1300 Block site with a mixed use development, including residential, and commercial retail space. The proposed development is modelled in two phases; the west side of block is to be developed first with an estimated completion date of 2015, followed by the eastern portion in 2017. The existing West Vancouver police station on the eastern portion of the site will remain in operation through the Phase 1 construction, and then relocated away from the 1300 Block site to enable the subsequent Phase 2 construction.

Bunt & Associates has examined the potential transportation impacts of this proposed redevelopment by conducting a comprehensive Transportation Study for the site. Included in the analysis are a Traffic Impact Study, Parking Analysis, and a Multi-Modal Impact Analysis.

1.2 Key Elements of the Transportation Impact Assessment

The following report analysis focuses on the following key considerations:

1.2.1 Traffic Impact Study

- Examine existing and projected future background traffic (area traffic *without* the proposed new development traffic factored in) conditions in the Study Area during the Weekday AM (morning rush hour), PM (afternoon rush hour) and Saturday mid-day peak traffic periods;
- Estimate the vehicle traffic generation of the proposed redevelopment for each of the two phases;
- Evaluate post-development traffic conditions;
- Provide traffic management strategies and recommendations.



Exhibit 1 Site Location

Ambleside Mixed-Use Development, 1300 Block Marine Drive, West Vancouver
4275.06 November, 2012 Scale NTS



Exhibit 2 Study Area - Intersections

1.2.2 Parking

- Document existing Study Area parking conditions;
- Estimate parking supply and demand dynamics created by the proposed new development;
- Provide parking management strategies and recommendations.

1.2.3 Multi-Modal Travel Assessment

- Evaluate existing and future multi-modal travel access to the site and through the Study Area;
- Examine east- west cycling route options through Study Area, and implications to transportation network.

2. PROPOSED DEVELOPMENT

A mixed-use residential/commercial redevelopment of the 1300 Block of Marine Drive is proposed to replace the existing West Vancouver police station and approximately 18,000 square feet of existing institutional, commercial and residential development on the site. The new development at completion is modelled with 88 residential condominium units, and approximately 43,250 square feet of street level retail shops and services including restaurants. The new development is modelled with 314 parking spaces located on three levels of parking beneath the new buildings.

The project is planned in two phases. Phase 1, modelled for completion in 2015, will occupy the western portion of the 1300 Block with approximately 50 residential units and approximately 22,079 square feet of commercial area. Driveway access to Phase 1 will be limited to Bellevue Avenue. The Phase 2 component of an additional 38 residential units and approximately 21,171 square feet of commercial space is planned for completion in 2017. With the Phase 2 development, an additional right-turn entry only access driveway is proposed for 13th Street.

3. TRAFFIC IMPACT STUDY

3.1 Objectives

- Evaluate exiting traffic operating conditions in Study Area during the Weekday AM, Weekday PM and Saturday mid-day peak traffic periods;
- Estimate future background traffic conditions (allowance for traffic growth other than that related to the proposed 1300 Block development) using applicable growth rates in conjunction with other known development projects that are anticipated to add traffic to the Study Area;
- Estimate the volume of peak hour traffic expected to be generated from the proposed 1300 Block development for both Phases 1 and 2;
- Evaluate traffic operations at Study Area intersections for each of the three traffic periods described above, at Opening Day Phase 1 (2015), Opening Day Phase 2 (2017), and a longer term future horizon year scenario (2027);
- Identify traffic impact mitigation measures where required.

3.2 Study Parameters

3.2.1 1300 Block Site

The 1300 Block site is currently developed with a 30,423 square foot police station and approximately 18,000 square feet of neighbourhood serving, ground level commercial shops and services. There is also a surface parking lot on the site with approximately 44 public parking spaces. The 1300 Block presently has driveway access on Bellevue Avenue and 13th Street. The western portion of the block has been vacant for approximately 10 years since the time the former gas station on this property was demolished.

3.2.2 Street Network

Marine Drive borders the north side of the 1300 Block and operates as an arterial street. Other than the Upper Levels Highway (Highway 1), Marine Drive is the main east-west continuous route in West Vancouver connecting the Ambleside and Dunderave commercial areas with residential neighbourhoods to the west, and the Lions Gate Bridge and North Vancouver to the east.

Bellevue Avenue borders the south side of the 1300 Block and operates as an east-west collector route providing access both to local businesses as well as Ambleside Park. Bellevue is also used by some traffic as an east-west bypass route to Marine Drive which is evident from the significant turning traffic volumes at the Bellevue/13th Street intersection.

Argyle Avenue runs parallel to the waterfront on the south side of the CN rail corridor and operates as a local road providing access to parking and public boat launch facilities at the Ambleside marina. Argyle is a one-way street (westbound) from 13th Street to its termination at 16th Street.

13th, 14th, and 15th Streets provide connections to the residential neighbourhoods to the north of Marine Drive. 15th Street operates as a major north / south collector road with a connection to the Upper Levels Highway.

3.2.3 Intersections

The following intersections (identified in Exhibit 2) are the key intersections within the traffic study area:

- Marine Drive & 13th Street (signalized - semi actuated with WBL protected/ permissive phase);
- Marine Drive & 14th Street (signalized - semi actuated);
- Marine Drive & 15th Street (signalized - semi actuated with SBL protected/ permissive phase);
- Bellevue Avenue & 13th Street (unsignalized);
- Bellevue Avenue & 14th Street (unsignalized);
- Bellevue Avenue & 15th Street (unsignalized);

- Argyle Avenue & 13th Street (unsignalized); and
- Argyle Avenue & 14th Street (unsignalized).

3.2.4 Traffic Analysis Time Periods

The Weekday AM, PM and Saturday mid-day peak periods were examined for the following traffic volume scenarios:

- Existing traffic 2011;
- Background traffic 2017;
- Background traffic 2027;
- Total traffic 2015 (Background 2017 plus Development Phase 1);
- Total traffic 2017 (Background 2017 plus Development Phase 1 & 2); and
- Total traffic 2027 (Background 2027 plus Development Phase 1 & 2).

3.3 Existing Traffic Volumes

To document existing peak period traffic volumes, Bunt & Associates collected Weekday AM and PM traffic data (vehicle, pedestrian, and cyclist volumes) on Thursday June 9, 2011 from 7 am to 9 am, and from 3 pm to 6 pm. Saturday mid-day traffic volumes were observed on Saturday, June 11, 2011 from 12 noon to 4 pm.

A summary of the existing Weekday AM, Weekday PM and Saturday mid-day peak hour traffic volumes is provided in **Exhibit 3**. Cyclist and pedestrian volumes are reported on later in Section 5 of this report.

3.4 Traffic Operations Analysis – Existing Conditions

A capacity analysis was conducted for the Study Area intersections to assess existing traffic conditions for the Weekday AM, PM and Saturday mid-day peak periods. Synchro 6.0 software was used for the analysis, based on the procedures outlined in the 2000 Highway Capacity Manual (HCM).

The reported performance criteria includes a measure of the traffic volume to capacity (v/c) ratio, and a traffic delay based Level of Service (LOS) measure at each study intersection. A v/c ratio less than 0.90 indicates acceptable traffic conditions, with sufficient capacity to accommodate demands; a v/c ratio between 0.90 and 0.95 indicates a near-capacity traffic condition with considerable delays and vehicle queuing. A v/c ratio over 0.95 indicates that traffic conditions are close to saturated or saturated, and traffic demand exceeds the available capacity. The LOS rating is based on average vehicle delay and ranges from “A”, which represents minimal delay conditions; to “F”, which represents congestion and/ or

considerable delays. For urban areas, a LOS of “D” or better and a V/C ratio of 0.90 or less generally represent acceptable traffic performance.

Exhibit 3: Existing Traffic Volumes

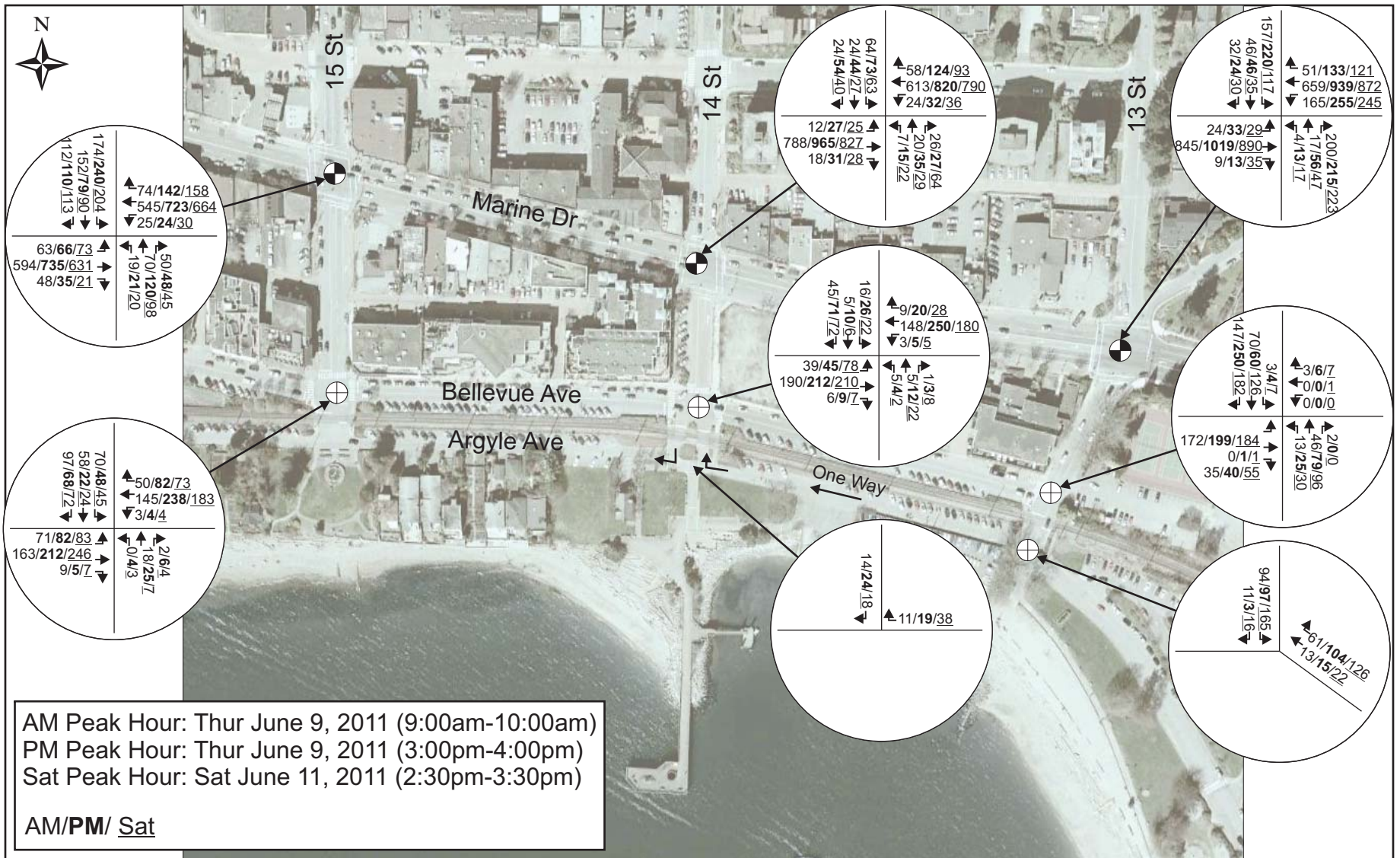


Exhibit 3 Existing (2011) Traffic Volumes

Table 1 summarizes the existing (2011) traffic operations of the Study Area intersections during the Weekday AM peak hour (9 am to 10 am), the Weekday PM peak hour (3 pm to 4 pm), and the Saturday mid-day peak hour (2:30 pm to 3:30 pm) periods.

Table 1: Existing (2011) Traffic Operations

Location	Weekday AM			Weekday PM			Saturday Mid-day		
	Movement	V/C	LOS	Movement	V/C	LOS	Movement	V/C	LOS
Marine Dr. & 13 th St. (signalized)	Overall	0.53	B	Overall	0.67	B	Overall	0.56	B
Marine Dr. & 14 th St. (signalized)	Overall	0.36	B	Overall	0.47	B	Overall	0.42	A
Marine Dr. & 15 th St. (signalized)	Overall	0.47	C	Overall	0.60	B	Overall	0.53	C
Bellevue Ave. & 13 th St.	Overall	-	A	Overall	-	A	Overall	-	A
Bellevue Ave. & 14 th St.	Overall	-	A	Overall	-	B	Overall	-	A

As evident from Table 1, each of the key intersections within the traffic study area generally operates well within capacity during each of the Weekday AM, PM and Saturday mid-day peak traffic periods. Notwithstanding this, vehicle queues do regularly develop on the westbound and eastbound Marine Drive approaches to the 14th and 15th Street intersections as through vehicles are impeded by left-turning vehicles (yielding to opposing through traffic) using the inside shared left/through lane, and by right-turning vehicles (yielding to pedestrian traffic) using the outside shared right/through lane. The introduction of either left-turn lanes or more fully developed right-turn lanes (requiring the removal of some on-street parking spaces) would improve overall traffic operation at these intersections and noticeably reduce the extent of vehicle queues during peak traffic periods.

The Argyle intersections as well as the Bellevue & 15th Street intersection with its 3-way stop control operation cannot be properly analyzed with the Synchro software package; hence these intersections are not shown in the above tables. Due to the relative low traffic volumes at these intersections, capacity issues are not expected. The volumes for the intersection are however included in the volume exhibits in order to get a better understanding of area traffic patterns.

3.5 Future Background Traffic

Background traffic is the component of traffic on the adjacent road network that would be present regardless of whether the site redevelopment occurred. The traffic volumes were forecasted for the anticipated year of Phase 1 opening day (2015), Phase 2 opening day (2017) and a ten year horizon (2027). Growth scenarios and applied rates were selected with consultation with District staff.

The assumed background traffic growth rate for this analysis is 0.5% per year and was directly applied to existing volumes. As an added measure of future potential area traffic increase, additional layers of development traffic generated by anticipated “near term” and “long term” developments in West Vancouver area were factored into the background traffic analysis. These are described more fully in the following Sections 3.5.1 and 3.5.2. All layers of the Traffic Volume calculations are provided in **Appendix A, B and C** for the Weekday AM, Weekday PM and Saturday peak hour periods respectively.

3.5.1 Near Term Other Developments

The potential future peak period traffic of other “near term” development projects predicted to add to traffic volumes in the 1300 Block traffic Study Area is presented in **Table 2** on the following page. These are developments that are expected to be completed within the next five years (by 2017). As indicated in **Table 2**, the additional vehicle trips from other near term development projects in the area are anticipated to increase traffic in the Study Area by 127, 227 and 290 vehicles per hour during the Weekday AM, PM and Saturday peak hour periods respectively. These trips were assigned into the Study Area based on existing traffic patterns in the area. The “near term” other development trip assignment is presented in **Exhibit 4**.

The added impact of the Rutledge all-weather playing field at 13th Street and Bellevue Avenue, which opened for use in September 2011, was also added as a separate layer with its own distribution pattern originating and departing from the east leg of the Bellevue & 13th Street intersection. The assumed traffic volume for the new playing field is 55 trips both entering and existing (total 110 vehicles per hour) during peak traffic periods. Bunt & Associates has not conducted any specific traffic counts since the Rutledge Field opened to confirm these traffic estimates; however, through observation alone on several occasions the driveway traffic associated with the playing field appears to be quite moderate with no significant operational issues noted at the 13th/Bellevue intersection.

3.5.2 Long Term Other Developments

For the 2027 analysis the potential for further development at Park Royal was also factored in. Details regarding future longer term residential development at Park Royal are undetermined at this time, with estimates ranging from 500 to 750 potential residential units. To be conservative we have assumed an increase of 750 residential units. This resulted in Study Area trips rising by 56 vehicles per hour in the AM, 68 vehicles per hour in the PM, and 61 vehicles per hour during the Saturday peak hour periods. The long term “other developments” trip assignment is presented in **Exhibit 5**.

3.5.3 Background Volume Analysis

The Background 2015, 2017 and 2027 traffic volumes for each examined time period are provided in **Exhibits 6–8**. **Table 3** reports the predicted future Background 2017 and 2027 traffic conditions for the Weekday AM, PM and Saturday peak hour periods. Signal timing plans were optimized based on the projected traffic volumes for the future horizon scenarios where indicated. Signal timings were optimized to allow for continued Marine corridor coordination.

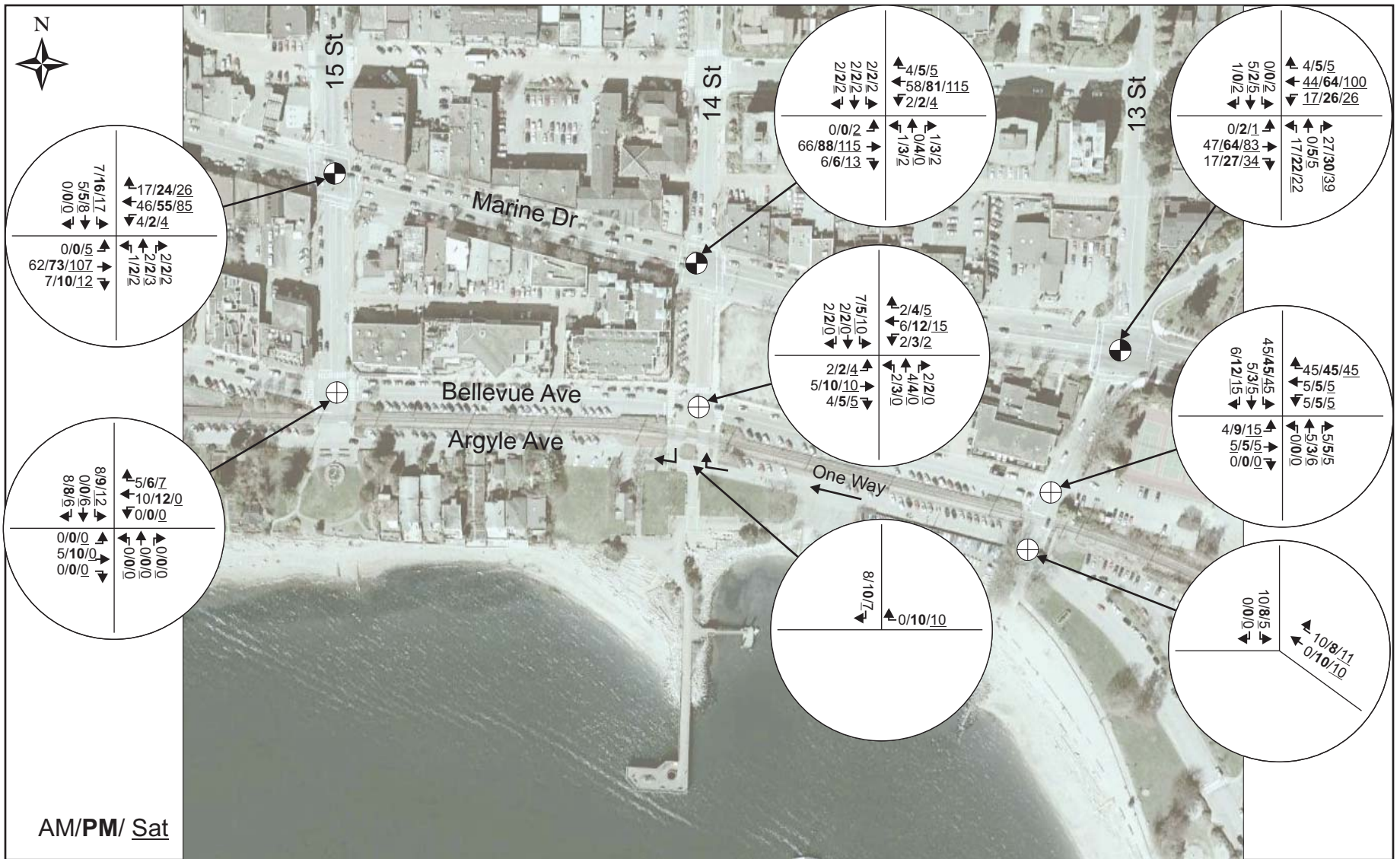


Exhibit 4 Other Developments, 2015

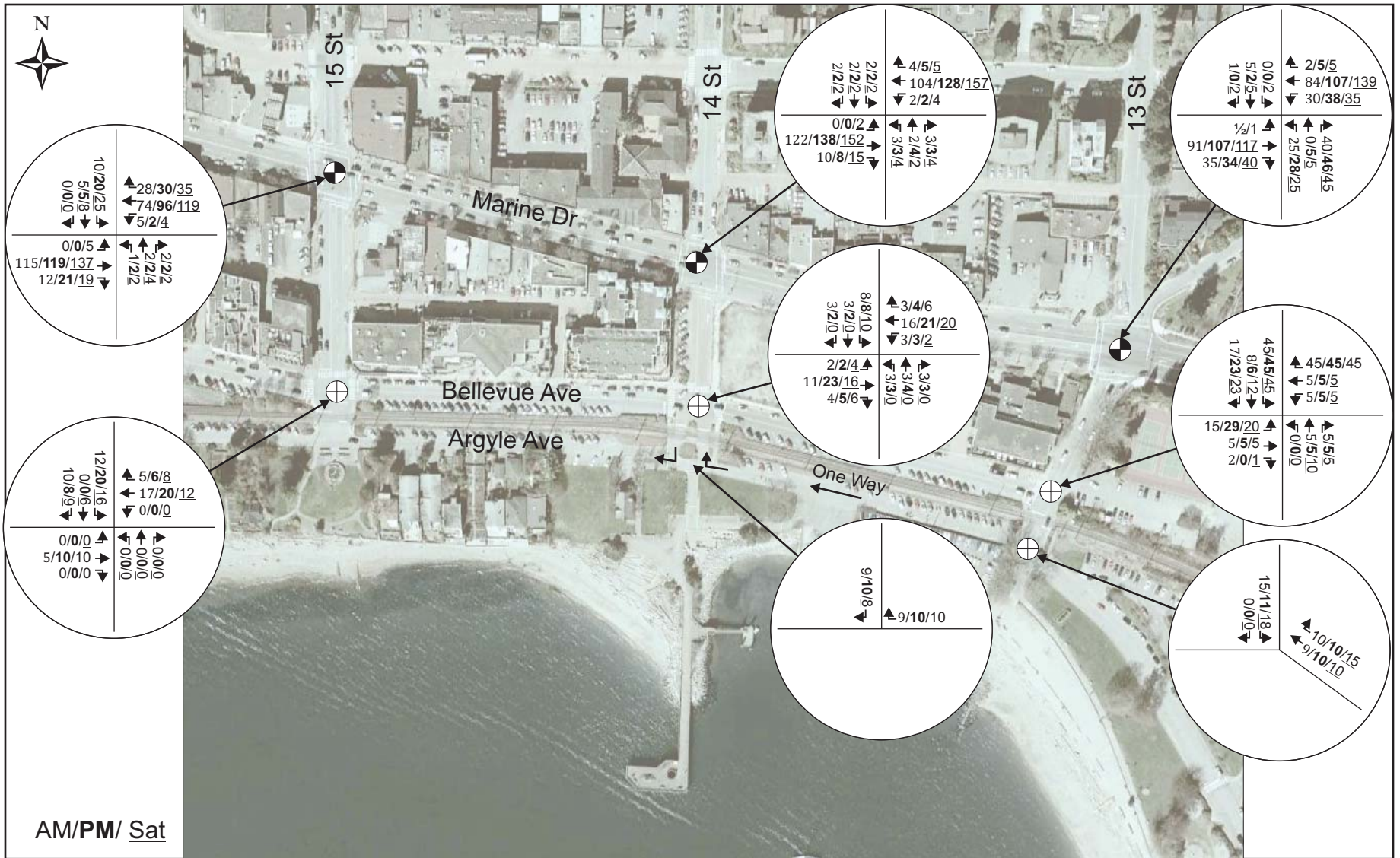


Exhibit 5 Other Developments, 2027

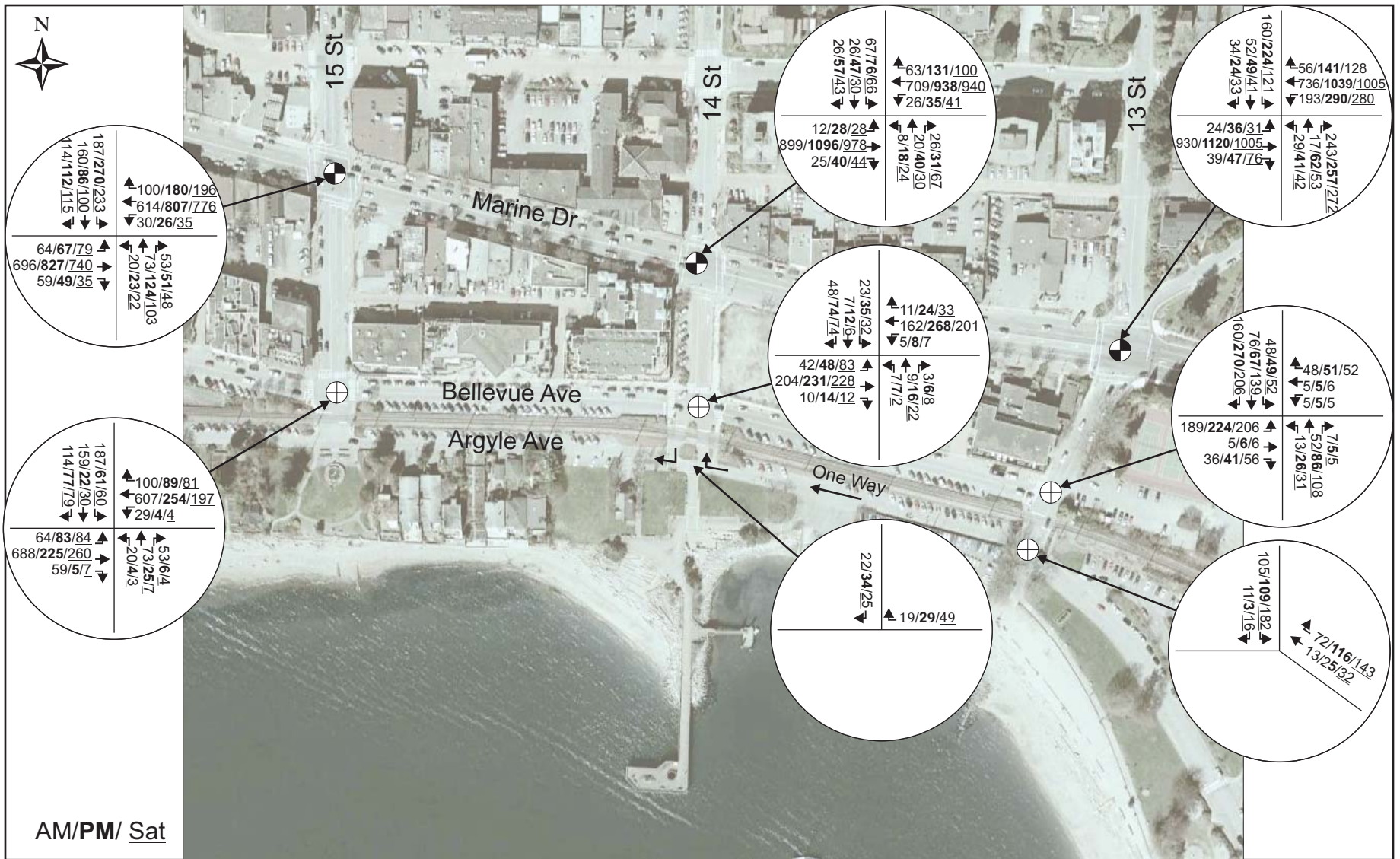


Exhibit 6 Background 2015

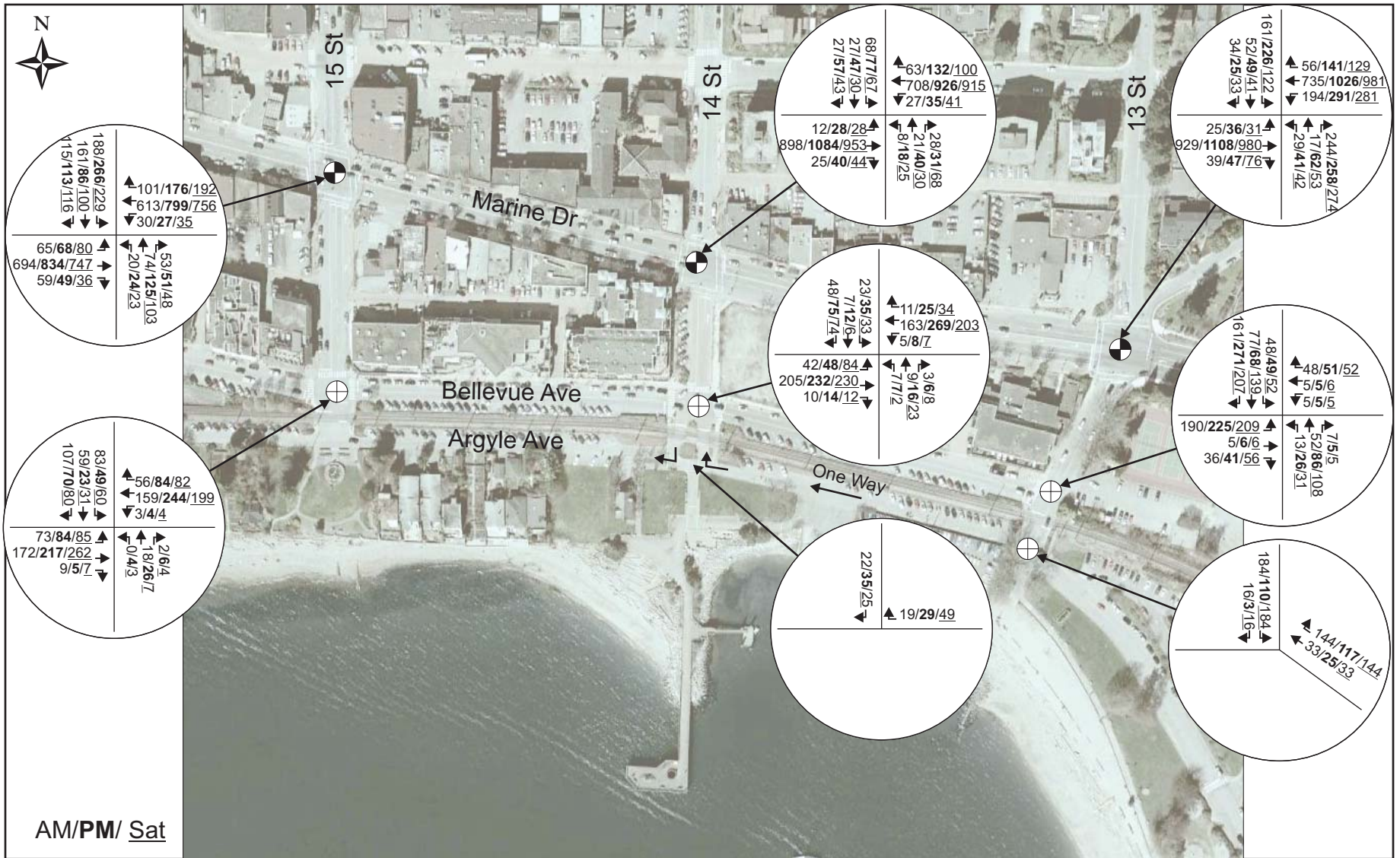


Exhibit 7 Background 2017

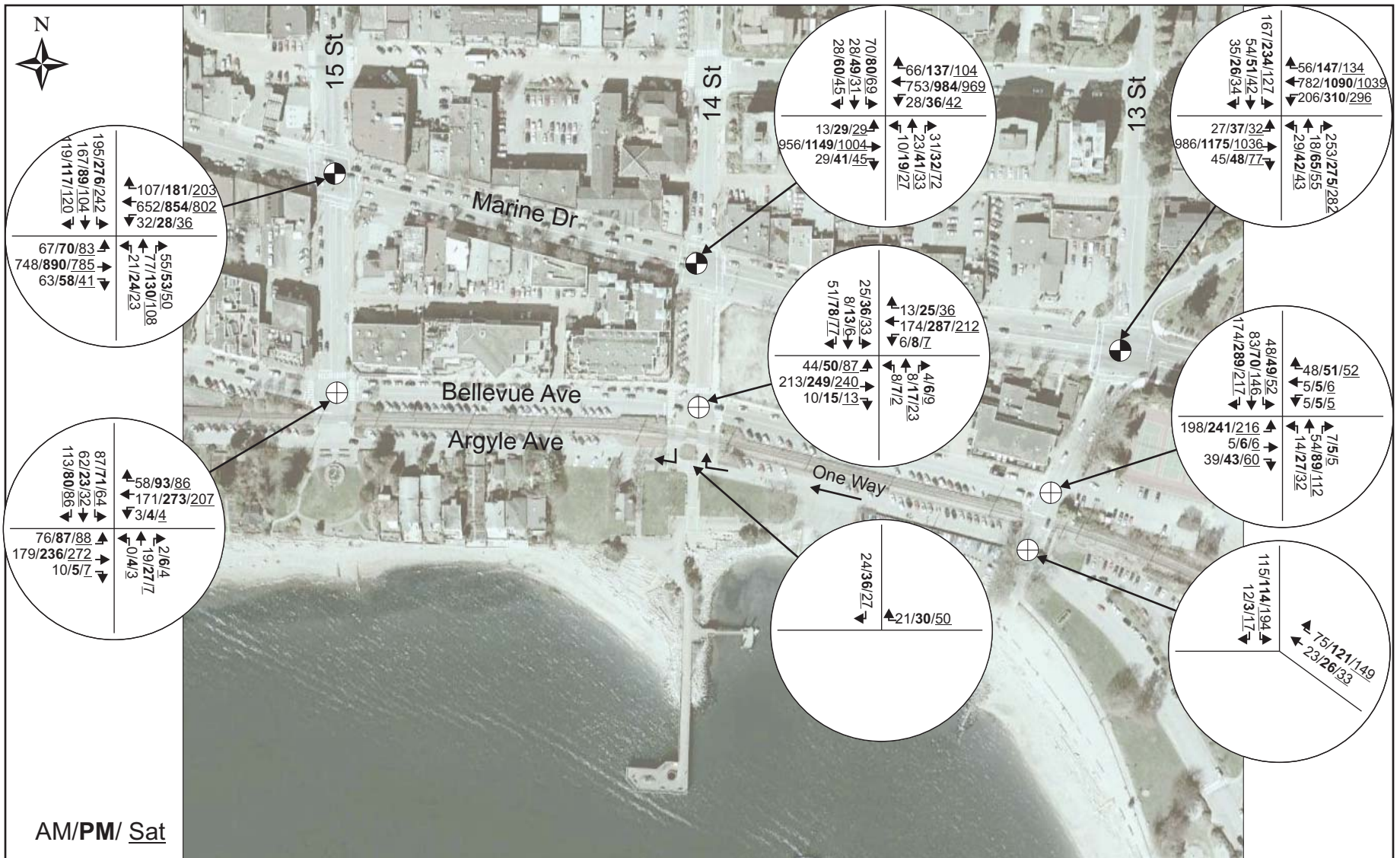


Exhibit 8 Background 2027

Ambleside Mixed-Use Development, 1300 Block Marine Drive, West Vancouver
4275.06 November, 2012 Scale NTS

Table 2: West Vancouver Development Layered into Background Volumes

Development Name & Address	Development Size (Units or Sq.Ft.)	Estimated Trip Gen. (veh. peak hour)	Assignment to Study Area (%)	Total Study Area Trips
Evelyn (Evelyn Dr & Taylor Way)	349 units	87- AM 105 - PM 94- Sat.	15%	13 - AM 16 - PM 14 - Sat.
Rodgers Creek (Cypress Bowl Rd)	736 units	493 - AM 574 - PM 514 - Sat.	10%	49 - AM 57 - PM 51 - Sat.
Park Royal Residential (White Spot site)	320 units	80 - AM 96- PM 86 - Sat.	30%	24 - AM 29 - PM 26 - Sat.
Park Royal Commercial	136,000 Sq.Ft	114 - AM 384 - PM 614 - Sat.	30%	34 - AM 115- PM 184 - Sat.
Kiwanis Seniors Housing (Haywood Ave. & 21 st St)	90 seniors units	13 - AM 20- PM 30- Sat.	20%	3 - AM 4 - PM 6 - Sat.
Pacific Arbour Seniors (Wetmore) (Marine Dr & 22 nd St)	130 seniors units	18 - AM 29 - PM 43 - Sat.	20%	4 - AM 6 - PM 9 - Sat.
Total	-	912- AM 1,259- PM 1,334 - Sat.	-	127 - AM 227 - PM 290 - Sat.

The residential trip rates used for the proposed site were used for all residential developments listed except Rodgers Creek where a higher more suburban rate was applied (ITE Land Use 231). Also for the seniors units, the ITE rate (Land Use 254) of 0.22 trips per unit was used. Commercial rates are ITE rates for retail (Land Use 815).

Note, the projected West Vancouver background development growth shown in Table 2 that is applied to the background growth 2017 was revised downward by approximately 14% from previous analysis. After distribution this difference represents less than 0.5% of Marine Drive existing or background volumes. As the removed developments of Taylorwood, the Municipal Hall and Safeway sites or other similar impacting developments may occur before 2027 these volumes were retained in the 2027 analysis models. If they these developments do not take place the extra volumes add a level of conservatism and do not impact analysis results or corresponding recommendations.

Table 3: Background Traffic Operations

i) 2015

Location	Weekday AM			Weekday PM			Saturday Mid-day		
	Movement	V/C	LOS	Movement	V/C	LOS	Movement	V/C	LOS
Marine Dr. & 13 th St. (signalized)	Overall	0.58	B	Overall	0.78	B	Overall	0.63	B
Marine Dr. & 14 th St. (signalized)	Overall	0.41	B	Overall	0.54	B	Overall	0.51	B
Marine Dr. & 15 th St. (signalized)	Overall	0.52	C	Overall	0.71	C	Overall	0.66	C
<i>Critical Movement</i>	-	-	-	EBT	0.93	C	EBT	0.92	C
Bellevue Ave. & 13 th St.	Overall	-	A	Overall	-	A	Overall	-	A
Bellevue Ave. & 14 th St.	Overall	-	A	Overall	-	B	Overall	-	B

ii) 2017

Location	Weekday AM			Weekday PM			Saturday Mid-day		
	Movement	V/C	LOS	Movement	V/C	LOS	Movement	V/C	LOS
Marine Dr. & 13 th St. (signalized)	Overall	0.58	B	Overall	0.79	B	Overall	0.64	B
Marine Dr. & 14 th St. (signalized)	Overall	0.41	B	Overall	0.54	B	Overall	0.52	B
Marine Dr. & 15 th St. (signalized)	Overall	0.53	C	Overall	0.72	C	Overall	0.67	C
<i>Critical Movement</i>	-	-	-	EBT	0.93	D	-	0.93	D
Bellevue Ave. & 13 th St.	Overall	-	A	Overall	-	A	Overall	-	A
Bellevue Ave. & 14 th St.	Overall	-	A	Overall	-	B	Overall	-	B

iii) 2027

Location	Weekday AM			Weekday PM			Saturday Mid-day		
	Movement	V/C	LOS	Movement	V/C	LOS	Movement	V/C	LOS
Marine Dr. & 13th St. (signalized)	Overall	0.62	B	Overall	0.84	C	Overall	0.67	B
<i>Critical Movement</i>	-	-	-	EBT	0.96	C	-	-	-
Marine Dr. & 14th St. (signalized)	Overall	0.44	B	Overall	0.59	B	Overall	0.55	B
Marine Dr. & 15th St. (signalized)	Overall	0.57	C	Overall	0.79	C	Overall	0.73	C
<i>Critical Movement</i>	-	-	-	EBT	1.02	D	-	0.99	D
Bellevue Ave. & 13th St.	Overall	-	A	Overall	-	A	Overall	-	A
Bellevue Ave. & 14th St.	Overall	-	A	Overall	-	B	Overall	-	B

Bolded values in the Tables above highlight values at a critical level. The corresponding values for previous time periods for the same movements are also provided in the tables for comparison purposes.

As indicated in Table 3, all intersections are anticipated to operate within capacity during both the Background 2017 and 2027 peak hour periods. However the eastbound through movement at Marine & 15th shows a 1.02 v/c ratio during the forecasted Background 2027 Weekday PM peak hour, and a 0.99 v/c ratio during the forecasted 2027 Saturday peak hour.

This same issue (Background 2027) was found with data collected by Bunt in December 2010 for the 1650 Marine Drive report (Ambleside Mixed-use Development, 1650 Marine Drive, February 17, 2011). In that report, the following conclusion was reported:

The Marine Drive & 15th Street intersection's eastbound leg is shown to experience a v/c ratio of 1.01 and the westbound leg shows a v/c ratio of 0.86 during the Background 2024 Weekday PM period.

Traffic volumes collected in June were slightly lower overall and in particular for the critical westbound and eastbound volumes and hence result in less critical conditions than the previous analysis of this intersection.

3.6 Background Conditions Issues and Traffic Impact Mitigation

3.6.1 Marine Drive & 15th Street

The impacts of signal optimization for the Marine & 15th intersection were examined. The results are presented below in Table 4.

Table 4: Impact of Optimizing Marine & 15th Signal

Marine Drive & 15 th St.	Weekday PM			Saturday Mid-day		
	Overall Intersection			Overall Intersection		
	Movement /Lane	V/C	LOS	Movement/ Lane	V/C	LOS
Background 2026	Overall	0.79	C	Overall	0.73	C
<i>Critical Movement</i>	EBT	1.02	D	EBT	0.99	D
Background 2026 Optimized – Signal Splits (same cycle length)	Overall	0.75	C	Overall	0.69	C
<i>Critical Movement</i>	EBT	0.91	C	EBT	0.91	c

The eastbound through at capacity condition is remedied with signal split optimization; hence the cycle length does not change allowing for no alterations to the cycle lengths of coordinated intersections along Marine Drive.

Optimizing the Marine & 15th signal using the higher December volumes was also shown to be mitigated by signal optimization. A 90 second cycle length was used for the Total 2027 condition resulting in an overall v/c of 0.78, individual movements for eastbound through at 0.85 and westbound through at 0.75. Increasing the coordinated cycle length of adjacent signals along Marine Drive to 90 seconds does not significantly impact their performance.

The impact of adding left turn lanes to Marine Drive at the Marine & 15th intersection was also examined. The results are presented below in Table 5. Permissive, protected as well as protected-permissive phases were examined for added left turn lanes. In addition, a pre-emptive east bound left turn phase was examined with the existing laning (eastbound shared left and through lane).

Table 5: Impact of Adding Left-Turn Lanes and Alternate Left Turn Phases to Marine & 15th Signal

Marine Drive & 15 th St.	Weekday PM		
	Overall Intersection		
	Movement/Lane	V/C	LOS
Background 2027	Overall	0.79	C
<i>Critical Movement</i>	EB Through	1.02	D
Background 2027 Left-Turn Lanes, Protected Phase	Overall	0.73	C
<i>Critical Movement</i>	EB Left	0.78	E
Background 2027 Left-Turn Lanes, Permissive Phase	Overall	0.66	C
<i>Critical Movement</i>	EB Left	0.76	D
Background 2027 Left-Turn Lanes, Prot. Perm. Phase	Overall	0.72	C
<i>Critical Movement</i>	EB Through	0.47	B
Background 2027 Left-Turn Prot. Phase – No Additional Lane	Overall	0.73	C
<i>Critical Movement</i>	EB Through	0.76	B

The addition of left turn bays on Marine Drive at the Marine & 15th intersection is shown to improve operating conditions. However, significant improvement is also shown by adding a protected left turn phase for the eastbound to north bound movement.

The addition of left turn bays on Marine Drive at this intersection would result in the loss of approximately 8 to 10 parking spaces and would also increase pedestrian crossing distances. Hence the option of signal optimization and the addition of a left turn phase for eastbound to northbound vehicles would be recommended over left turn bays in order to mitigate expected Background 2027 operational issues at this intersection.

3.6.2 Marine Drive & 13th Street

The present analysis does not indicate background issues at the Marine & 13th intersection. However, previous analysis for the December 2010 volumes collected for the West Vancouver Community Development project suggested the westbound left movement at this intersection may be nearing capacity conditions during the peak Weekday PM hour for the longer term (Year 2036) horizon year analysis.

3.6.3 Bellevue Avenue & 13th Street

As shown in Table 3 the Bellevue and 13th Street intersection operates well within capacity according to the Synchro analysis. However, issues beyond Synchro's ability to calculate are of concern, specifically:

- The short southbound approach, where queues at the intersections north leg spill back towards the busy Marine and 13th Street intersection;
- The train tracks just meters from the south leg; and,
- The offset of Bellevue and the playing field access.

As these issues are part of the existing condition and are best to be mitigated during the developments adjacent second phase, mitigation options are described in the Future Condition Analysis - Section 3.10.3.

3.7 1300 Block Development Generated Traffic

The ITE Trip Generation Manual is the industry-wide standard in North America for assessing vehicle trip generation for new developments. However, its focus is primarily on suburban sites where the automobile is the dominant transportation mode, and this is acknowledged on page 80 in the ITE Handbook as follows:

"The focus of the data presented throughout the trip generation is on sites in suburban settings with limited or no transit service and free parking" and that site selection is based on "limited ability for pedestrians to walk into the site from nearby parcels".

Given that this is not entirely the case for the proposed development, we have assumed a number of trip rates that are more in keeping with the urban character of the corridor.

A description of the assumed trip rates is provided below:

3.7.1 Residential Trip Rates

The residential trip rates are based on observations made by Bunt & Associates at several developments located in commercial areas, and on main transit routes. Three such studies have shown similar results and have consistently shown that residential trip rates in these areas are lower than standard ITE suburban rates. Table 6 summarizes observed trip rates in Metro Vancouver for medium to high density residential developments in areas with a wide range of local facilities and easy access to transit.

Table 6: Observed Residential Trip Rates* in Urban Areas

Residential Site	Weekday AM			Weekday PM		
	In	Out	Total	In	Out	Total
Newport Village, Port Moody	0.07	0.22	0.29	0.18	0.11	0.29
Kerrisdale, Vancouver	0.05	0.20	0.25	0.21	0.09	0.30
Lower Lonsdale, North Vancouver	--	--	--	0.22	0.11	0.33
UniverCity at SFU, Burnaby	0.03	0.19	0.22	0.14	0.09	0.23
Shaughnessy Village, Port Coquitlam	--	--	--	0.26	0.14	0.40
Arbutus Walk, Vancouver	--	--	--	0.19	0.08	0.27
Average Observed Rates	0.05	0.20	0.25	0.20	0.10	0.30

Notes: * Trip Rates expressed in vehicle trips/1,000 SF of GFA

The assumed trip generation rates are as per the observed trip rate average in Table 6. The Saturday trip rate was calculated assuming the ITE ratio of ITE-PM rate to ITE-Sat rate. Table 7 summarizes the ITE residential trip rates, which as shown are slightly higher than what we would expect for this development. Again, the ITE rates are more suited to a suburban development with minimal local shops and transit connections.

Table 7: ITE Residential Trip Rates

ITE	Trip Rates*		
	AM	PM	Sat
Code 232 (High-rise Condo/Townhouse)	0.34	0.38	0.35

Notes: * Trip Rates expressed in vehicle trips/1,000 SF of GFA

3.7.2 Retail Trip Rates

The assumed retail trip generation rates are based on ITE general rates for retail stores and were assumed for 28,250 sq.ft of the retail CRU component of the site. The Weekday PM and Saturday peak hour rates are based on ITE Code 814 (Specialty Retail). The AM peak hour rate is based on ITE Code 815 (Free-standing Store), deemed the most appropriate comparison as the Specialty Retail code does not have AM data for the peak hour of adjacent traffic. The remaining 15,000 sq.ft of the commercial space was assigned the higher trip rate of “Quality Restaurant” (ITE Code 931).

3.7.3 Pass-by Rates

We have assumed that the commercial component of site traffic will include a portion of pass-by trips. Pass-by trips are trips that are already passing by the site and would continue to do so whether or not the project proceeds. Pass-by trips are made as intermediary stops along the course of a trip between an origin and a primary trip destination. These trips are attracted from existing traffic passing the site on adjacent streets, in this case Marine Drive. The weekday pass-by trips were assumed to account for 30% of the retail site traffic, and the Saturday pass-by trips were assumed to account for 25% of the retail site traffic.

3.7.4 Trip Generation Summary

The trip generation estimate for the proposed mixed-use development is summarized in Tables 8 and 9 during the three time periods for Phase 1 and Phase 2 (shown as Phase 1 +2) respectively. Note: all trip rates are per 1,000 square feet of space or the number of residential units.

At Phase One completion the Police Station and the existing retail space is expected to continue operations, hence the traffic generation for these uses was not subtracted from the Phase One trip generation calculations. The police generated traffic is represented within the existing volumes.

As shown in Tables 8 and 9, the development at Phase 1 completion is anticipated to generate a total of approximately 15 new trips during the Weekday AM peak hour (2 in, 13 out), approximately 61 new trips during the Weekday PM peak hour (52 in, 9 out) and about 88 new trips during the Saturday peak hour (57 in, 31 out).

At the completion of Phase 2 the police station will be closed, hence the police station trips were subtracted out to obtain the site's net trip generation. At Phase 2 completion the development is expected to generate a total of approximately 22 new trips during the Weekday AM peak hour (4 in, 18 out), approximately 98 new trips during the PM peak hour (51 in, 47 out) and about 136 new trips during the Saturday peak hour (74 in, 62 out).

Table 8: Estimated New Site Generated Traffic Volumes – Phase I

i) AM Peak Hour – Phase I

Use	# Units , Size (SF)	Trip Rate	Source	Traffic Volumes Traffic Volumes		
				In	Out	Total
Residential	50	0.25	Bunt	3	10	13
Retail – Restaurant	15,000	0.81	ITE 931	6	6	12
Retail	7,079	1.06	ITE 815	5	2	7
Subtotal Additions				+14	+18	+32
Police Station	30,423	Survey	Bunt	remains	remains	remains
Retail	15,000	1.06	ITE 815	-10	-5	-15
Retail Pass-by Trips (30%)				-2	0	-2
Retail Internal Trips (5%)				0	0	0
Subtotal Subtractions				-12	-5	-17
TOTAL Net Trips				+2	+13	+15

ii) PM Peak Hour- Phase I

i)

Use	# Units , Size (SF)	Trip Rate	Source	Traffic Volumes Traffic Volumes		
				In	Out	Total
Residential	50	0.30	Bunt	9	6	15
Retail - Restaurant	15,000	7.49	ITE 931	75	37	112
Retail	7,079	2.71	ITE 814	9	10	19
Subtotal Additions				+93	+53	+146
Police Station	30,423	Survey	Bunt	remains	remains	remains
Retail	15,000	2.71	ITE 814	-18	-23	-41
Retail Pass-by Trips (30%)				-20	-19	-39
Retail Internal Trips (5%)				-3	-2	-5
Subtotal Subtractions				-41	-44	-85
TOTAL Net Trips				+52	+9	+61

ii) Saturday Afternoon Peak Hour – Phase I

Use	# Units , Size (SF)	Trip Rate	Source	Traffic Volumes Traffic Volumes		
				In	Out	Total
Residential	50	0.27	Bunt	6	8	14
Retail - Restaurant	15,000	10.82	ITE 931	96	66	162
Retail	7,079	4.20	ITE 814	15	15	30
Subtotal Additions				+117	+89	+206
Police Station	30,423	Survey	Bunt	remains	remains	remains
Retail	15,000	4.20	ITE 814	-32	-31	-63
Retail Pass-by Trips (25%)				-24	-24	-48
Retail Internal Trips (5%)				-4	-3	-7
Subtotal Subtractions				-60	-58	-118
TOTAL Net Trips				+57	+31	+88

Table 9: Estimated New Site Generated Traffic Volumes – Phase II

i) AM Peak Hour – Phase I & II Combined

Use	# Units , Size (SF)	Trip Rate	Source	Traffic Volumes Traffic Volumes		
				In	Out	Total
Residential	88	0.25	Bunt	4	18	22
Retail - Restaurant	15,000	0.81	ITE 931	6	6	12
Retail	28,250	1.06	ITE 815	20	10	30
Subtotal Additions				30	34	64
Police Station	30,423	Survey	Bunt	-6	-6	-12
Retail	15,000	1.06	ITE 815	-11	-5	-16
Retail Pass-by Trips (30%)				-8	-5	-13
Retail Internal Trips (5%)				-1	0	-1
Subtotal Subtractions				-26	-16	-42
TOTAL Net Trips				+4	+18	+22

ii) PM Peak Hour- Phase I & II

Use	# Units , Size (SF)	Trip Rate	Source	Traffic Volumes		
				In	Out	Total
Residential	88	0.30	Bunt	16	10	26
Retail - Restaurant	15,000	7.49	ITE 931	56	56	112
Retail	28,250	2.71	ITE 814	33	44	77
Subtotal Additions				+105	+110	+215
Police Station	30,423	Survey	Bunt	-6	-6	-12
Retail	15,000	2.71	ITE 814	-18	-23	-41
Retail Pass-by Trips (30%)				-27	-30	-57
Retail Internal Trips (5%)				-3	-4	-7
Subtotal Subtractions				-54	-63	-117
TOTAL Net Trips				+51	+47	+98

iii) Saturday Afternoon Peak Hour – Phase I & II

Use	# Units , Size (SF)	Trip Rate	Source	Traffic Volumes		
				In	Out	Total
Residential	88	0.27	Bunt	10	14	24
Retail - Restaurant	15,000	10.82	ITE 931	96	66	162
Retail	28,250	4.20	ITE 814	57	62	119
Subtotal Additions				+163	+142	+305
Police Station	30,423	Survey	Bunt	-6	-6	-12
Retail	15,000	4.20	ITE 814	-32	-31	-63
Retail Pass-by Trips (25%)				-46	-38	-84
Retail Internal Trips (5%)				-5	-5	-10
Subtotal Subtractions				-89	-80	-169
TOTAL Net Trips				+74	+62	+136

3.8 Trip Distribution and Assignment

The distribution of the new site-generated traffic was assigned to the adjacent road network based on existing traffic patterns. The estimated new site generated development volumes at each Study Area intersection for the Weekday AM, PM and Saturday Mid-day peak hour periods are provided in Exhibits 9 & 10. *Note the development trips shown in Exhibits 9 and 10 are from an earlier rendition of the development plan which resulted in a modestly higher number of development generated trips. Using the previous, modestly higher trip generation estimates in our analysis adds a level of conservatism to our analysis but does not impact the conclusions and recommendations herein.*

For this analysis, 50% of the site generated entry traffic for Phase 1 was assigned to the site from 13th Street (although entering from Bellevue due to the Police Station remaining in Phase 1) and the remainder from the west, again using the Bellevue Avenue frontage. Exiting traffic was all assigned onto Bellevue Ave. with a 50% split to both the east and west.

Pass-by trip distribution was assumed for the AM at 70% from the west, 70% from the east in the PM, and a 50% split during the Saturday peak hour period.

Table 10 summarizes the assumed site traffic distributions for the three peak period hour periods.

Table 10: Estimated Site Traffic Distribution

Access Route	AM Peak Hour		PM Peak Hour		Sat. Peak Hour	
	In	Out	In	Out	In	Out
Marine Dr. - Westbound	30%	35%	40%	45%	25%	40%
Bellevue Ave. - WB	0%	10%	0%	10%	0%	10%
13 th Ave. - NB	0%	5%	0%	5%	0%	5%
14 th Ave. - NB	0%	5%	0%	5%	0%	5%
15 th Ave. - NB	0%	15%	0%	15%	0%	15%
13 th Ave. - SB	5%	0%	5%	0%	5%	0%
14 th Ave. - SB	5%	0%	5%	0%	5%	0%
15 th Ave. - SB	15%	0%	15%	0%	15%	0%
Marine Dr. - EB	35%	30%	25%	20%	40%	25%
Bellevue Ave. - EB	10%	0%	10%	0%	10%	0%
Total	100 %	100 %	100 %	100 %	100 %	100 %

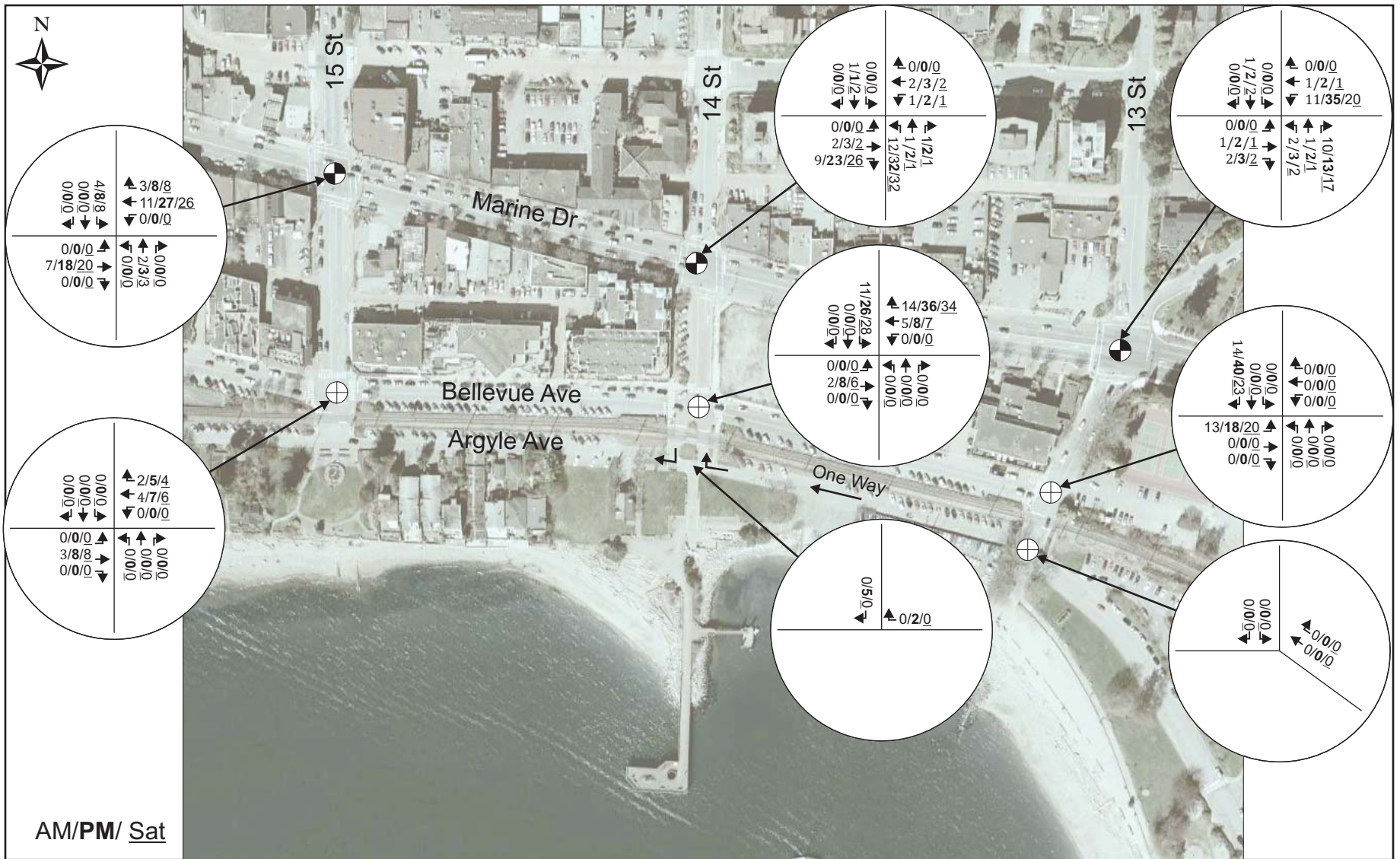


Exhibit 9 2015 Development Volumes Phase 1

Ambleside Mixed-Use Development, 1300 Block Marine Drive, West Vancouver
4275.06 November, 2012 Scale NTS

3.9 Future Total Traffic Conditions

Total traffic consists of the proposed development site-generated traffic volumes added to the projected background traffic volumes. The projected Total traffic volumes for 2015, 2017 and 2027 are provided in Exhibits 11-13. Table 11 summarizes the future (post-development) traffic operations of the Study Area intersections in the Weekday AM, PM and the Saturday mid-day peak hours at Phase 1 Opening Day 2015, Phase 2 Opening Day 2017 and Opening Day plus 10 years, 2027.

Table 11: Total Traffic Operations
i) Phase 1 Opening Day - 2015

Location	Weekday AM			Weekday PM			Saturday Mid-day		
	Movement	V/C	LOS	Movement	V/C	LOS	Movement	V/C	LOS
Marine Dr. & 13 th St. (signalized)	Overall	0.59	B	Overall	0.80	b	Overall	0.64	B
Marine Dr. & 14 th St. (signalized)	Overall	0.41	B	Overall	0.55	B	Overall	0.55	b
Marine Dr. & 15 th St. (signalized)	Overall	0.53	C	Overall	0.74	C	Overall	0.69	C
<i>Critical Movement</i>	-	-	-	EBT	0.95	D	-	0.94	D
Bellevue Ave. & 13 th St.	Overall	-	A	Overall	-	A	Overall	-	A
Bellevue Ave. & 14 th St.	Overall	-	A	Overall	-	B	Overall	-	B

ii) Phase 2 Opening Day - 2017

Location	Weekday AM			Weekday PM			Saturday Mid-day		
	Movement	V/C	LOS	Movement	V/C	LOS	Movement	V/C	LOS
Marine Dr. & 13 th St. (signalized)	Overall	0.59	B	Overall	0.81	B	Overall	0.65	B
<i>Critical Movement</i>	-	-	-	EBT	0.90	C	-	-	-
Marine Dr. & 14 th St. (signalized)	Overall	0.42	B	Overall	0.55	A	Overall	0.53	b
Marine Dr. & 15 th St. (signalized)	Overall	0.53	C	Overall	0.75	C	Overall	0.70	C
<i>Critical Movement</i>	-	-	-	EBT	0.97	D	-	0.95	D
Bellevue Ave. & 13 th St.	Overall	-	A	Overall	-	A	Overall	-	A
Bellevue Ave. & 14 th St.	Overall	-	A	Overall	-	B	Overall	-	B

iii) Future Horizon Year 2027

Location	Weekday AM			Weekday PM			Saturday Mid-day		
	Movement	V/C	LOS	Movement	V/C	LOS	Movement	V/C	LOS
Marine Dr. & 13 th St. (signalized)	Overall	0.63	B	Overall	0.86	B	Overall	0.69	B
<i>Critical Movement</i>	-	-	-	EBT	1.00	C	-	-	-
Marine Dr. & 14 th St. (signalized)	Overall	0.45	B	Overall	0.61	B	Overall	0.57	B
Marine Dr. & 15 th St. (signalized)	Overall	0.58	C	Overall	0.82	D	Overall	0.76	d
<i>Critical Movement</i>	-	-	-	EBT	1.06	E	EBT	1.03	E
Bellevue Ave. & 13 th St.	Overall	-	A	Overall	-	A	Overall	-	B
Bellevue Ave. & 14 th St.	Overall	-	A	Overall	-	B	Overall	-	B

As indicated in Table 11, all intersections overall operate well within capacity during the Total 2015, 2017 and 2027 Weekday AM, PM and Saturday mid-day peak hour periods.

However, like in the Background 2027 analysis, the eastbound through (EBT) movement at the Marine & 15th intersection shows a 0.95 v/c ratio during the 2015 period, a 0.97 v/c ratio during the 2017 period and a 1.06 v/c ratio during the forecasted Total 2027 Weekday PM peak hour.

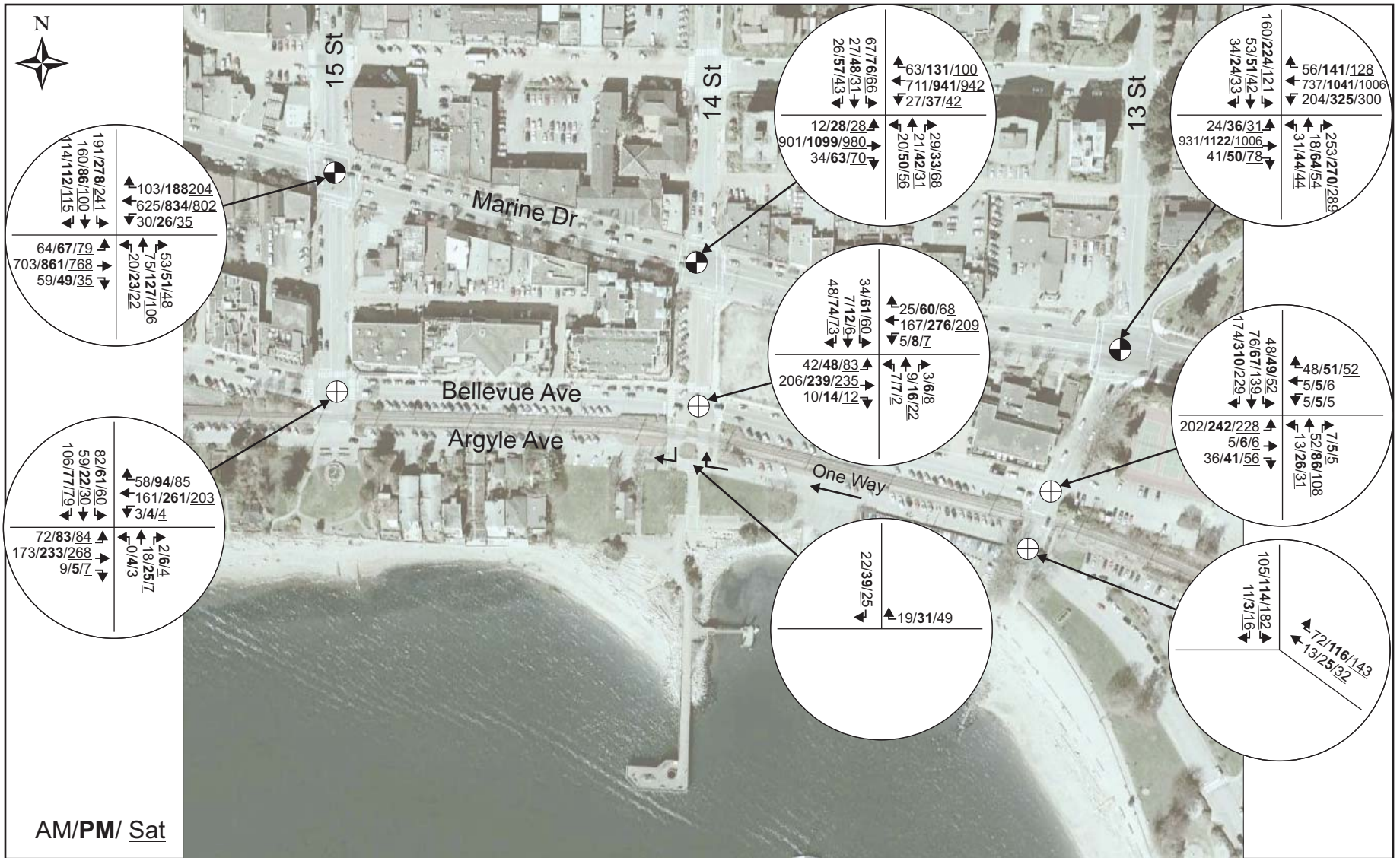


Exhibit 11 Total Traffic Volumes 2015

Ambleside Mixed-Use Development, 1300 Block Marine Drive, West Vancouver
4275.06 November, 2012 Scale NTS

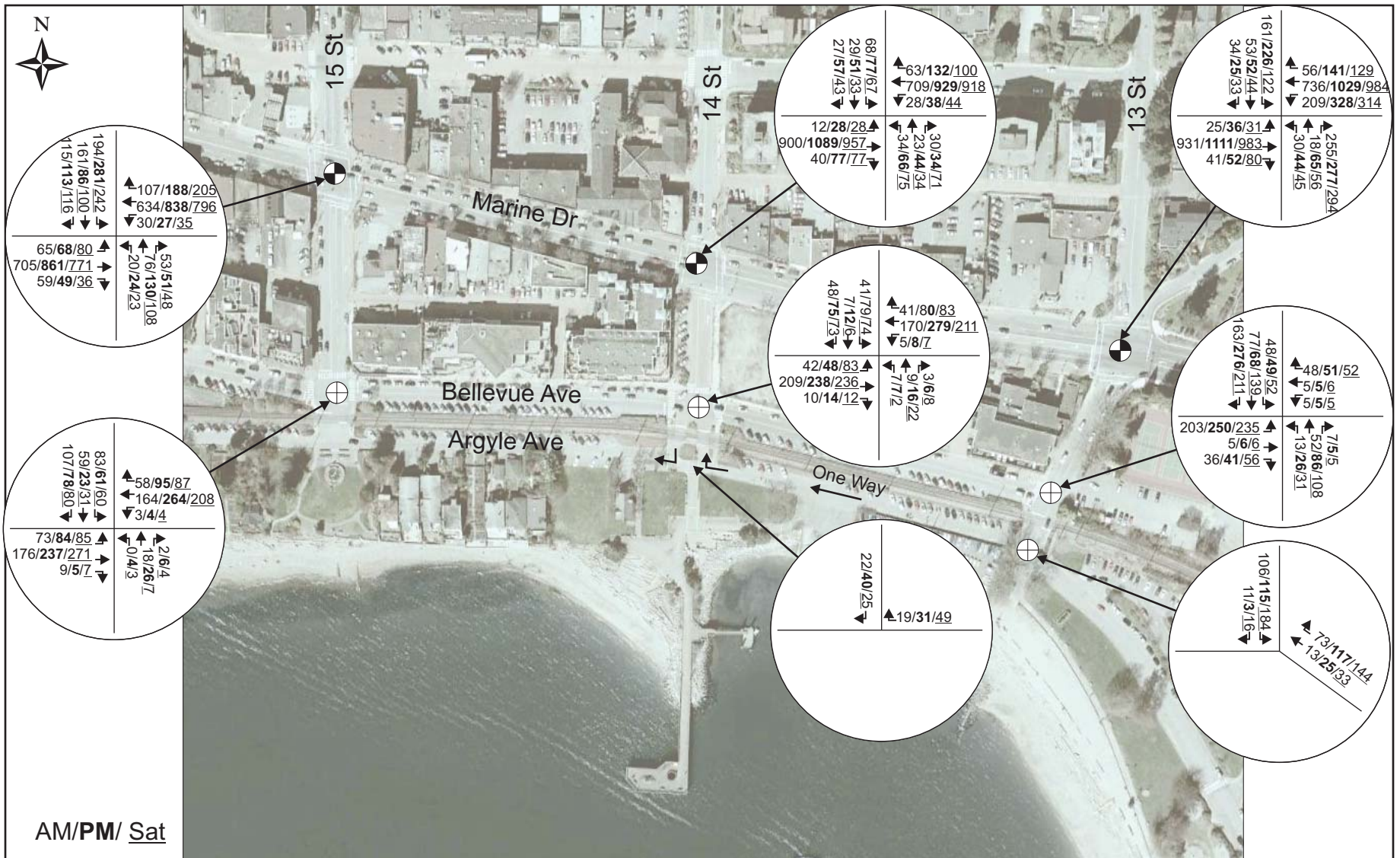


Exhibit 12 Total Traffic Volumes 2017

Ambleside Mixed-Use Development, 1300 Block Marine Drive, West Vancouver
4275.06 November, 2012 Scale NTS

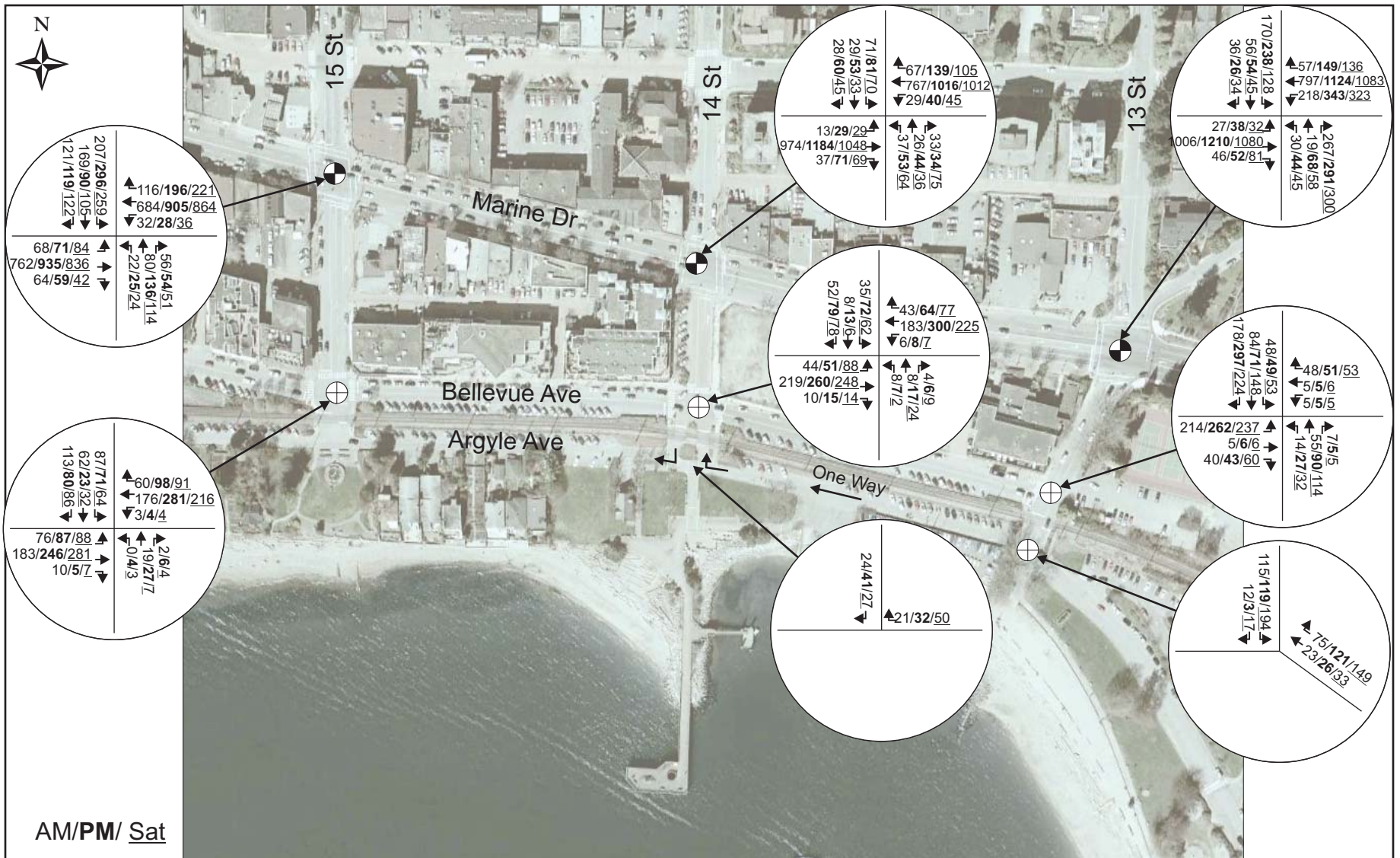


Exhibit 13 Total Traffic Volumes 2027

The eastbound through movement at the Marine & 13th intersection shows a 1.00 v/c ratio during the Total 2027 Weekday PM peak hour period.

3.10 Mitigation for Total Conditions

3.10.1 Marine & 15th Street Intersection

The impact of signal optimization for the Marine & 15th intersection was examined for the Weekday PM total condition. The results are presented below in Table 12.

Table 12: Impact of Optimizing Marine & 15th Signal

Marine Drive & 15 th St.	Weekday PM		
	Overall Intersection		
	Movement/Lane	V/C	LOS
Background 2027	Overall	0.79	C
<i>Critical Movement</i>	EBT	1.02	D
Background 2027 Optimized – Signal Splits (same cycle length)	Overall	0.75	C
<i>Critical Movement</i>	EBT	0.91	C
Total 2027	Overall	0.82	D
<i>Critical Movement</i>	EBT	1.06	E
Total 2027 Optimized – Signal Splits (same cycle length)	Overall	0.79	C
<i>Critical Movement</i>	EBT	0.94	D

The eastbound through movement at Marine & 15th is again remedied with signal split optimization for the total traffic condition; keeping the cycle length does not require alterations to the cycle lengths of the other coordinated intersections along Marine Drive. However the v/c ratio for the eastbound through movement is shown to be at the cusp of operating at capacity conditions.

The impact of adding left turn lanes to Marine Drive at the Marine & 15th intersection was also examined. The results are presented below in Table 13. The better performing permissive phasing was examined for the left turn lanes. Like in the Background condition analysis, adding a protected eastbound to northbound left turn phase, without adding a left turn lane was also examined.

Table 13: Impact of Adding Left-Turn Lanes and Alternate Left Turn Phases to Marine & 15th Signal

Marine Drive & 15 th St.	Weekday PM		
	Overall Intersection		
	Movement/Lane	V/C	LOS
Background 2026	Overall	0.79	C
<i>Critical Movement</i>	EB Through	1.02	D
Background 2026 Left-Turn Lanes, Prot./ Perm. Phase	Overall	0.72	C
<i>Critical Movement</i>	EB Through	0.47	B
Total 2026	Overall	0.82	C
<i>Critical Movement</i>	EB Through	1.06	E
Total 2026 Left-Turn Lanes, Prot./ Perm. Phase	Overall	0.77	C
<i>Critical Movement</i>	EB Through/ EBL	0.55 / 0.44	B/B
Total 2026 Protected Eastbound Left Turn Phase	Overall	0.78	C
<i>Critical Movement</i>	EBT	0.90	C

The addition of left turn lanes on Marine Drive at the Marine & 15th intersection is again also shown to improve operating conditions for the eastbound left movement; however significant improvement is also shown by adding a protected left turn phase for the eastbound to northbound movement.

As mentioned prior, the addition of left turn bays on Marine Drive at this intersection would result in the loss of approximately 8 to 10 parking spaces and would also increase pedestrian crossing distances.

Hence the less intrusive and simple option of signal optimization and the addition of a protected left turn phase for eastbound to northbound vehicles would be recommended over adding left turn lanes to mitigate expected post-development operational issues at this intersection.

This recommendation is the same as the recommendation for background condition mitigation.

3.10.2 Marine Drive & 13th Street Intersection

The development site at project build out is expected to add approximately 30 to 40 Marine Drive westbound left to southbound turning vehicles during the Weekday PM and Saturday peak hours resulting in an overall v/c ratio of 0.86 and an eastbound through v/c ratio of 1.00 during the highest volume Weekday PM period during the Total 2027 Weekday PM peak hour condition (shown in Table 12iii).

Previous analysis for the December 2010 volumes collected for the West Vancouver Community Development project suggested the opposing westbound left movement at this intersection may also be nearing capacity conditions during the peak Weekday PM hour for that study's horizon year analysis (2036).

Signal optimization within the 90 second cycle length results in expected conditions at the intersection during the Total 2026 condition of v/c ratio 0.83 overall, with an LOS C, the eastbound left v/c ratio lowers to a 0.93 and the westbound left lowers to a v/c ratio of 0.92.

The northbound queues at the Marine & 13th Street intersection are also of interest as they may impact site access configurations off of 13th Street.

The northbound queues extending south from Marine Drive were examined using the SimTraffic software package. During the peak Weekday PM period average queues are expected to extend 28 m for the northbound right movement and approximately 24 m for the northbound through/ left lane. The 95th percentile northbound right turn queues are expected to extend up to 55m in the Weekday AM and 35 m in the Weekday PM peak hour periods. As there is approximately 50 m between Marine Drive and Bellevue Avenue on 13th Street, accessing this area may prove difficult for northbound vehicles wishing to exit the development site. Further discussion regarding limiting the 13th Street access to a right-in only is discussed in Section 4.2.

3.10.3 Bellevue Avenue & 13th Street

As described in Section 2.6.3 existing issues are noted at the Bellevue & 13th Street intersection. They are:

- The short distance between Marine Drive and Bellevue Avenue results in a short north leg approach, queues at the intersections north leg could spill back towards the busy Marine and 13th Street intersection;
- The CN Rail train tracks run immediately across the intersections south leg; and,
- The approximate 8 m offset of 1300 Block Bellevue Avenue from the playing field access.

All three of these issues are existing, pre-development issues of intersection configuration. The additional traffic from the proposed development will represent a minor (0 to 7%¹) component of the overall total traffic volumes.

While not a product of the proposed development, it is our belief that the District would be prudent to explore the proposed redevelopment of 1300 Block as opportunity to improve this intersection.

It is recommended that after the developments first phase the District should consider adding a traffic signal and to reconfigure the intersection to minimize potential queuing issues and to move away from the adjacent rail crossing. A potential reconfiguration scheme is presented in **Exhibit 14**.

¹ Estimated as difference of development generated volumes over total 2026 volumes for key or critical movements to Marine Drive & 13th Street and Bellevue Avenue & 13th Street intersections.

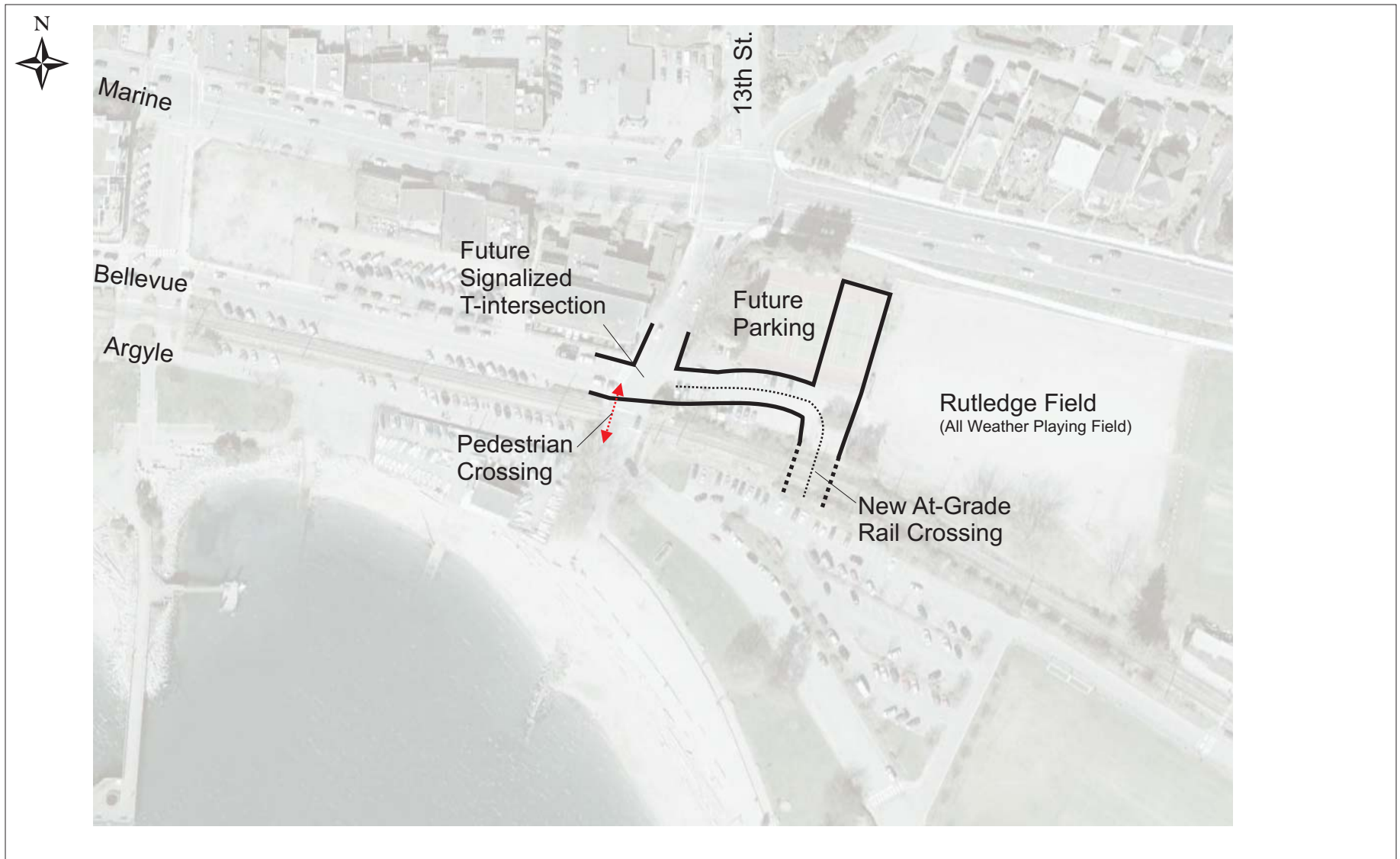


Exhibit 14
Potential Bellevue & 13th Street Reconfiguration

Ambleside Mixed-Use Development, 1300 Block Marine Drive, West Vancouver
4275.06 February, 2012 Scale NTS

3.10.4 Sensitivity Test for Potential Squamish Lands Development

The District also expressed interest in examining the future impact of potential Squamish Nation development, which would be located at the north end of the Lions Gate Bridge. There are currently no proposed development plans hence we proceeded with an assumption of 1,000 residential units. A 30% distribution to the Study Area on an approximate 0.30 trip rates results in approximately generated 100 trips during the peak hour periods. Applying and distributing these 100 trips into the Study Area (Total 2027) resulted in the following key impacts after recommended mitigation measures mentioned above implemented (add protected eastbound left phase to Marine & 15th intersection and signal optimization along Marine corridor):

- Eastbound through at Marine & 15th Street 0.95 v/c ratio; and,
- Eastbound through at Marine & 13th Street 0.97 v/c ratio.

3.11 Traffic Summary & Recommendations

- The observed Weekday AM and PM and Saturday mid-day peak hour periods were from 9 to 10 AM and 3 to 4 PM during the peak Weekday periods and between 2:30 and 3:30 PM during the Saturday.
- The Study Area road network does not encounter capacity issues during the Existing peak Weekday or Saturday periods.
- The eastbound through movement at the Marine & 15th Street intersection does encounter capacity issues during the Background 2027 scenario. This issue is mitigated by signal timing optimization.
- The proposed development at build out is expected to generate a maximum net trip increase of 22 (4 in and 18 out) vehicle trips in the weekday AM peak hour, 98 trips (51 in and 47 out) in the Weekday PM peak hour and by 136 (74 in and 62 out) trips during the Saturday mid-day peak hour.
- Each of the Study Area capacity issues were found to occur in both the future total and future background scenarios. The issues flagged by Synchro were at the Marine & 15th intersection (eastbound through) and the Marine & 13th intersection (westbound left & eastbound through).
- With signal split optimization and the addition of an eastbound protected left turn phase at the Marine & 15th Street intersection all intersection in the Study Area are expected to operate within capacity during all time periods in the horizon Total 2027.

- Northbound queues on 13th Street adjacent to the development block are expected to potentially interfere with access movements out of the development site. Hence a right-in only configuration may be best suited to this location. This will be addressed further in the Access & Loading section of the report.
- It is recommended that after the developments first phase the District should consider adding a traffic signal to the Bellevue & 13th Street intersection and to consider reconfiguring the intersection to allow for better queue storage, alignment and to move away from the adjacent rail crossing.
- Traffic operations in the adjacent road network area are not expected to encounter capacity issues due to the proposed development. Potential issues are largely a product of background traffic growth on Marine Drive. The examined intersections on Marine Drive demonstrate the ability to accommodate the increased traffic levels with traffic signal optimization.
- Mixed-use development such as this proposed development can be expected to have a positive impact on future mode split trends.

4. PARKING & LOADING

4.1 Background

The parking Study Area's existing (August 2011) parking supply and regulations are illustrated in **Exhibit 15**.

There are presently 44 on-site spaces that serve the block's current land uses. Within the on-street Study Area there are 102 publicly available parking spaces around the site's immediate area (area shown in Exhibit 6). Of these 102 spaces, 40 are on Marine Drive, 8 are on 14th Street, 24 on Bellevue Avenue and 30 on Argyle Avenue. Note, development plans do not include the spaces on Argyle Avenue, hence an existing supply of 72 spaces is shown with a proposed supply of 77 spaces.

Ambleside Park to the southeast of the site is serviced with a parking lot of approximately 118 publicly available parking spaces. The recently completed playing fields to the east of the site are serviced with 50 parking spaces.

Previous reporting by Bunt in September of 2006 indicated that parking within the Study Area fills to approximately 80% occupancy during the Weekday and Saturday peak periods. This was confirmed with recent (summer 2011) spot counts, and also with parking data from the 1600 Block Safeway site study², 3 blocks to the west where peak parking occupancy occurred at 2 PM during the observed Weekday (85% occupancy) and at 2 PM during the Saturday (84%).

Previous reporting by Bunt for the playing fields to the immediate east of the development block indicated that the playing fields may be short of parking by approximately 15 spaces.

4.2 Estimated Development Parking Demand

As shown below in **Table 13**, the parking provisions for the proposed development, at project build-out results in an excess of 29 parking spaces over bylaw requirements. 14 of these extras spaces are for the residential component and 15 are from the commercial component.

²December 2010 data for Marine Drive areas combined with summer data for waterfront areas

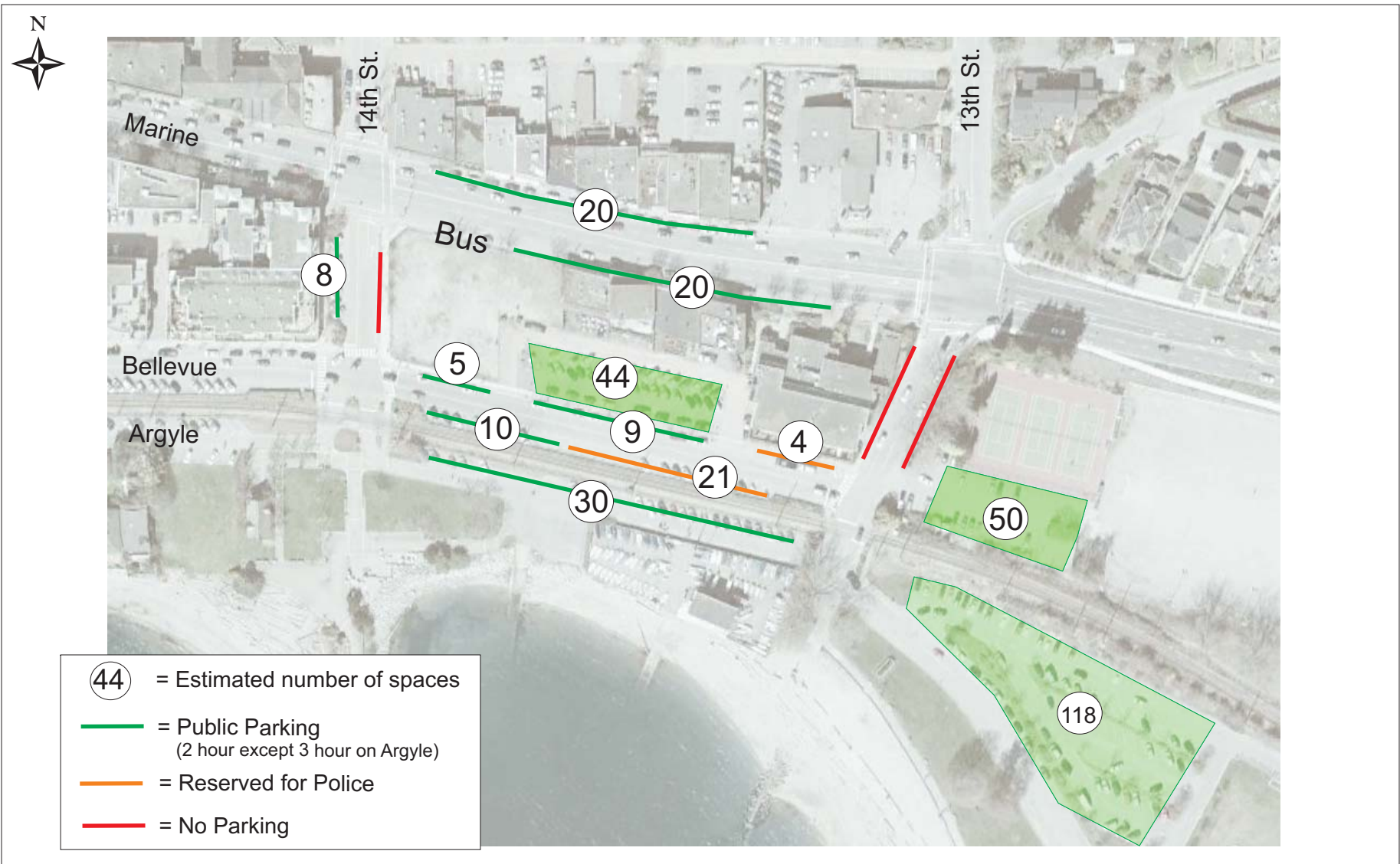


Exhibit 15 Existing Parking Supply and Regulations

Table 13: On-site Parking Requirements and Proposed Provisions

	Bylaw Rate	Bylaw Requirement	Provision	Difference
Phase 1				
Commercial	1 per 398 sf	56	62	+6
Residential	1 per 904 sf./ 2 per unit	100	140	+40
Phase 1 Subtotal	-	156	202	+46
Phase 2				
Commercial	1 per 398 sf	53	62	+9
Residential	1 per 904 sf./ 2 per unit	76	50	-26
Phase 2 Subtotal	-	129	112	-17
Project Build-out				
Commercial	1 per 398 sf	109	124	+15
Residential	1 per 904 sf./ 2 per unit	176	190	+14
Total	-	285	314	+29

Eleven of the resident parking spaces are for resident visitors.

Considering potential for shared parking synergies from the different land uses within the proposed development, the actual parking space demand is expected to be approximately 5 -10% lower than the figures presented in Table 13. A key synergy would be between commercial components and the residential visitor parking component as the two land uses have separate peak periods.

Parking and vehicle trip generation rates are also expected to be lowered slightly due to the number of residents that will now be living on-site.

The above commercial rates are consistent with observed rates at the 1650 Marine Drive Safeway site where parking generation rates of 3.3 spaces per 1,000 square feet of commercial space during the Weekday peak hour and 2.7 spaces per 1,000 square feet during the Saturday peak hour were observed.

The reason for the slightly higher residential parking rates is the relative large size of the units and in order to provide residents with an enclosed garage style flex space. Because the 2 spaces per unit will be

built garage style, it is likely that the extra space will be used for garage style activities and storage rather than to park a second vehicle.

The extra 15 commercial spaces are in excess of projected on-site development demand.

4.2.1 On-Street Parking

The on-street parking supply on Marine Drive is to remain the same. The number of spaces on 14th Street is also to remain the same as existing as the current 8 angled spaces on the west side of the Street are replaced with 4 parallel on each side of 14th Street adjacent to the site.

There are expected to be 5 more public use spaces on Bellevue Avenue as the current 24 spaces (14 on the north side of Bellevue and 10 on the south) are replaced with 29 angled spaces on the south side of Bellevue.

In total, on the adjacent roads the number of publically available parking spaces increases from approximately 102 to 107 spaces as the Police Station reserved use spaces will become open to the public.

A portion of the existing on-site surface parking lot is expected to remain with the completion of the developments first phase.

4.3 Parking Summary and Recommendations

- The immediate parking area has a total of 102 on-street parking spaces, and 44 on-site spaces, which are meant for the current land uses on the block.
- On-street parking in the area is currently highly occupied during peak periods. This is projected to continue due to potential shortfall at the playing fields of approximately 15 spaces.
- The proposed development at build-out provides 29 on-site spaces above bylaw. 14 of these extra spaces are for the residential component and 15 are from the commercial component.
- The 14 extra residential spaces reflect the larger family orientated unit sizes and the desire to provide garage style parking spaces. The flex use ability of the extra garage style parking spaces is expected to have a positive impact on vehicle ownership rates.
- The publically available on-street parking supply on the adjacent roads (1300 block Marine, 1300 Block Bellevue, on 14th Street adjacent to the site, as well as on Argyle to the south of site) will increase by 5 parking spaces over current supply (102 to 107 spaces).
- The 44 at-grade spaces which are currently on-site service the parking requirements of the block's current land uses. The development's proposed 124 commercial on-site parking spaces for its commercial component replace these current 44 on-site spaces.

- In sum, the development will result in 15 on-site commercial spaces above bylaw and an additional 5 on-street spaces over current levels, for a post-development total of 20 additional publically available parking spaces over bylaw forecasted demand.
- Total parking supply available to the public (non-residential) before the proposed development is 146 spaces (102 on-street plus 44 on-site). The development will result 231 publically available parking spaces (107 on-street plus 124 on-site). This represents an increase of 85 publically available parking spaces on site and on the streets adjacent to the 1300 block development site.
- We would encourage the developer to actively promote transit use, provide higher than bylaw bicycle parking and to explore the potential for providing parking for future car share vehicles. Suggested methods for promoting non-vehicle modes of transportation are presented in Section 5.5.

4.4 Loading

Loading vehicles as well as garbage and recycling trucks will access the site from Bellevue Avenue. All loading and garbage/recycling collection will be accommodated internally within the development.

5. BELLEVUE AVENUE – STREET PARKING

5.1 Driveway Access

There will be a full movement access from Bellevue Avenue that will service both the developments first and second phase. There is no current or future vehicular access to the site from Marine Drive.

We would recommend a right-in only entry off of 13th Street. This is due to space restrictions on 13th Street between Marine Drive and Bellevue Avenue. This right-in will allow vehicles to enter the site without having to be added on the Bellevue and 13th Street intersection.

5.2 Bellevue Avenue

With the redevelopment of the Marine Drive 1300 Block, Bellevue Avenue's 1300 Block section will also be redeveloped. As the development area of the 1300 Block parcel is at a premium, we would suggest that parking along Bellevue's south side to be at 45 degrees. The proposed Bellevue configuration is shown in **Exhibit 16**. This option balances the on-street parking needs, development parcel area, and maintains good traffic flow along Bellevue. The development plans also show a space for public art and space provided along Bellevue's south edge for a two-way cycling facility.

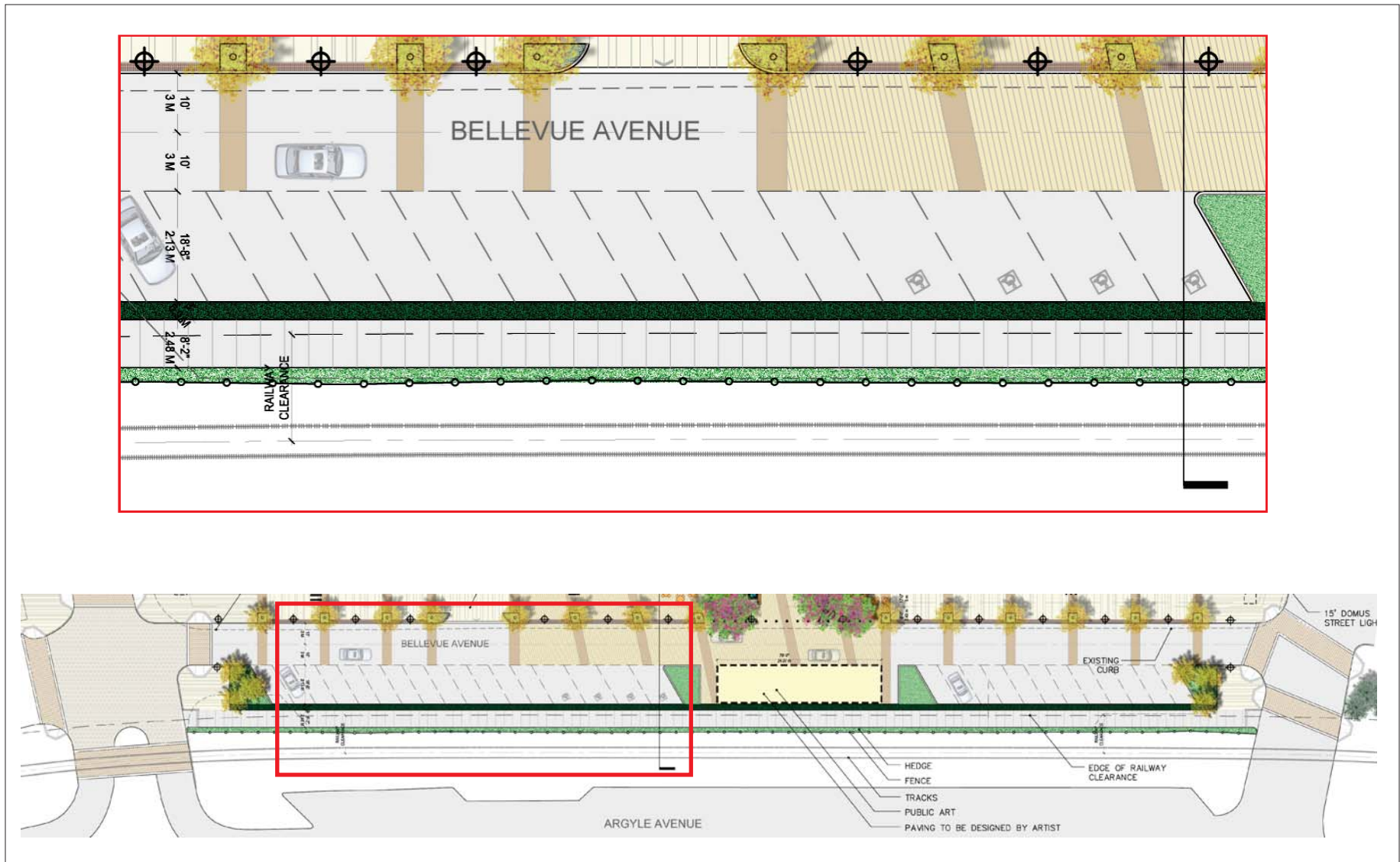


Exhibit 16 Bellevue Avenue

Ambleside Mixed-Use Development, 1300 Block Marine Drive, West Vancouver
4275.06 November, 2012 Scale NTS

6. MULTI-MODAL TRAVEL ASSESSMENT

6.1 Walking

The adjacent walking amenities adjacent to the site and along the waterfront provide excellent pedestrian connections to/from the site and the local amenities.

The Study Area is a comparatively high pedestrianized area. The number of peak hour pedestrian at each of the surveyed intersections is presented below in **Exhibit 17**.

6.1.1 Development Impact to Walking

An increase in overall pedestrian activity is anticipated in this area with up to 300-400 new residents living at the 1300 Block site. As the number of residential units in the neighbourhood continues to increase the walking mode split is expected to continue to grow into the future.

The development plans offer generous sidewalks and public realm. In addition, the pedestrian connections through the block support pedestrian activity in the area.

6.2 Cycling

The redevelopment of 1300 Block Marine Drive presents a strategic opportunity to improve bicycle connections in the Ambleside area. A number of existing cycling routes converge in this area including 14th Street, Clyde Avenue, Keith Road and Spirit Trail to the south.

With the proposed redevelopment the District of West Vancouver seeks to explore options regarding the connection of the 14th Street cycling route with Marine Drive to the east. This desire has led to discussions regarding the feasibility of adding cycling amenities to the south or eastbound side of 1300 Block Marine Drive. Options include adding sharrows to the existing width of the southernmost eastbound travel lane or adding width to this lane in order to provide a shared lane (space for motorists to pass cyclists within the lane).

Observed east-west cyclist volume data adjacent to the Study Area is presented on **Exhibit 18**. Cyclist volumes as a percentage of vehicle traffic are also displayed in order to understand the context of the volumes.

6.2.1 Cycling Route Recommendations

The adjacent cycling amenities along the waterfront (Argyle / Spirit Trail) provide excellent east - west cycling connections for the proposed site. Using Marine Drive for confident (existing) cyclists allows a more direct route along the corridor. However, if the District wishes to expand the cyclist modal split, in our opinion an east-west connection that encourages cycling south of Park Royal should be prioritized.

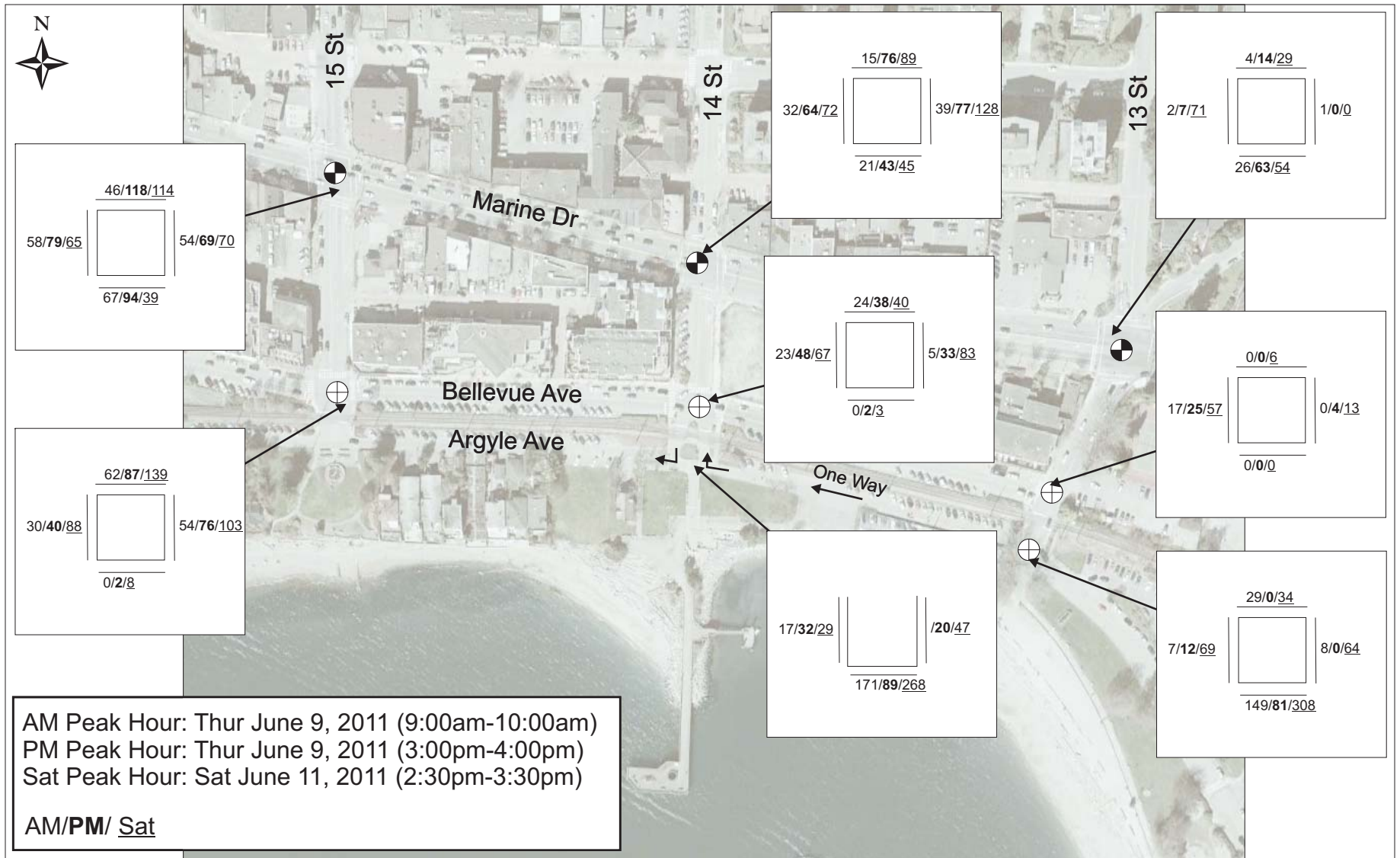
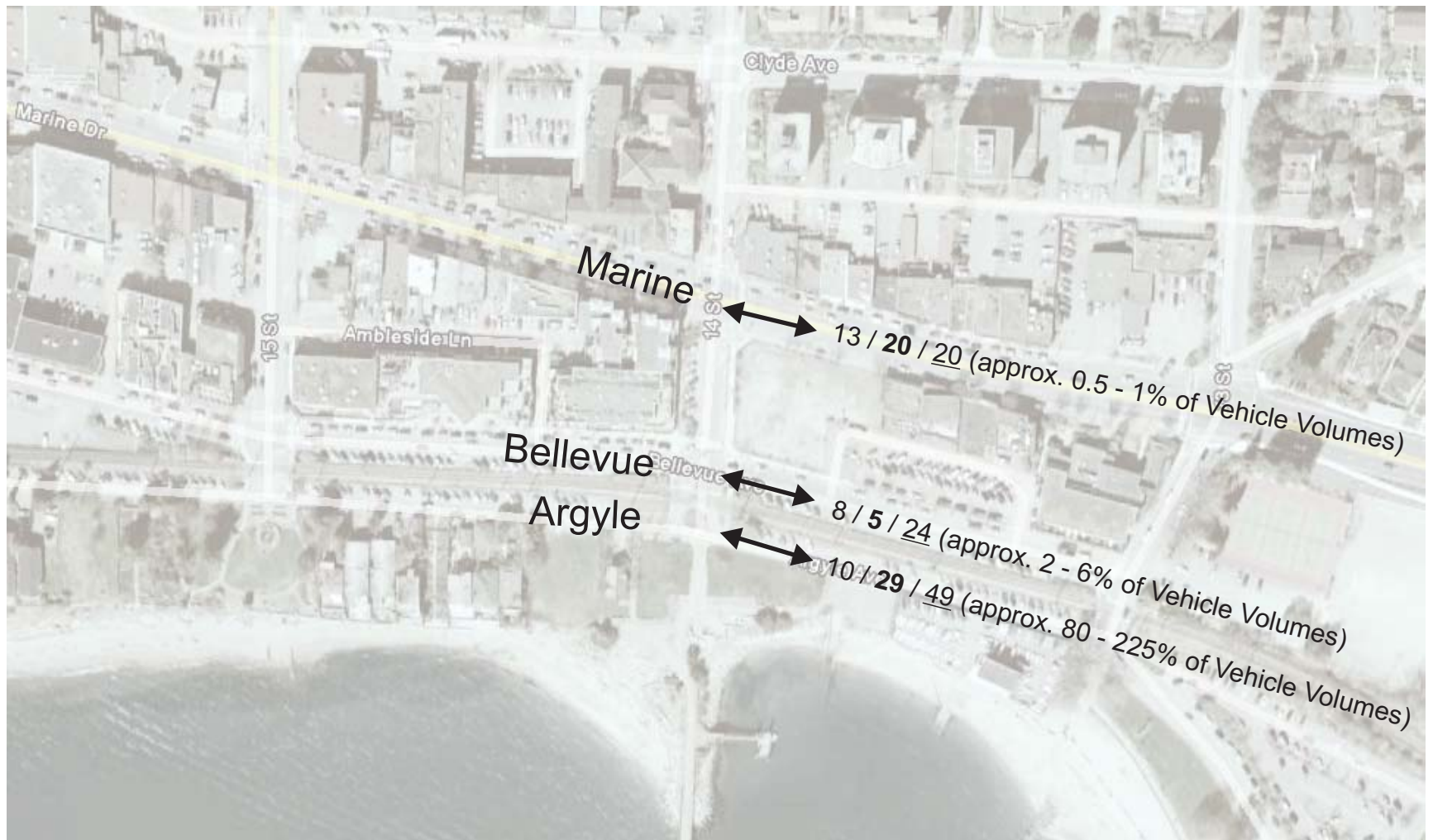


Exhibit 17 Existing (2011) Pedestrian Volumes



AM/PM/ Sat Peak Hour Volumes

Exhibit 18 Cyclist Volumes

Recent cycling advocacy has focused on the ‘potential’ cyclist demographic (3). Most important to this demographic is actual safety and also the feeling of, or perceived safety. Encouraging potential new cyclists to use busy and higher speed travel lanes on Marine Drive or the bus lanes on Marine Drive adjacent to Park Royal would run counter to the objective of providing actual and perceived cyclist safety. The high percentage of heavy vehicles and turning movement along this stretch of Marine Drive and the frequent stopping and starting does not provide a comfortable cycling environment for potential or more novice cyclists. Hence having a more formal cycling provision on Marine Drive, such as cycling lanes or a shared lane may only encourage more novice cyclists to use a route that is beyond their comfort level.

Cyclist volumes on Marine Drive represent less than 1% of the vehicle volumes, approximately 5% of the vehicle traffic on Bellevue and over 100% of the vehicle volume on Argyle Avenue. In addition to vehicle volumes, vehicle operating speeds are also higher on Marine Drive. Due to these factors we feel cycling amenity priority on Argyle would yield the highest return of cycling mode split increase by providing potential cyclists the perception of safety that they desire.

Cyclists desiring a higher speed route will continue to use Marine Drive, hence it is recommended that sharrows be painted onto the right eastbound lane (existing lane width) in order to alert motorists that the lane is also used by cyclists.

The alternative of providing additional lane width (to 4.3 m) on Marine Drive to create a shared lane for motorists and buses to pass cyclists within the lane up against a lane of parked vehicles is not considered the safest option for cyclists. Instead using the existing width and adding sharrows is a perfectly appropriate treatment where the purpose would be to give the lane to the cyclist, and have the motorist temporarily slow down or use the adjacent eastbound travel lane for passing. The use of sharrows in this manner is particularly suitable for short distances such as the 1300 block of Marine Drive.

Pavement variations on Bellevue Avenue can be used to slow vehicles and to give the street a muse feel which would be attractive to cyclists wishing to travel on a lower speed and lower vehicle volume route.

6.2.2 Sharrows on Eastbound Marine Drive

Sharrows are an appropriate treatment in travel lanes that are too narrow to accommodate in-lane motorist passing of cyclists. Sharrows are typically used to indicate that a cyclist may use the full travel lane and to position the cyclist within the lane away from adjacent car doors and expectations of far right side lane travel which may encourage motorists to attempt an unsafe in-lane pass. Sharrows are not intended to be

3 Cycling in Cities, TransLink & UBC, 2009.

a cycling provision, or even an attractor of cyclists. The purpose of a sharrow is simply to alert motorists of cycling presence, not to suggest extra lane width (4).

6.3 Transit

The site is well connected with transit. Bus stops immediately adjacent the site on Marine Drive provides access to 9 bus routes connecting the site with neighborhoods throughout West Vancouver and also the greater Metro Vancouver area. Currently the site is serviced with between 18-30 buses per hour in both the west and east directions on Marine Drive during peak activity periods.

6.3.1 Transit Projections

Recent improvements to the Marine Drive corridor have resulted in improved bus transit operation in the area, particularly in the eastbound direction toward the Lions Gate Bridge. These improvements include the construction of an eastbound bus lane along the Park Royal frontage, and transit only signal phasing through the Marine Drive/Taylor Way intersection. These improvements will continue to attract increasing levels of transit usage among existing and future residents of West Vancouver.

The multi-use synergy of mixing residential with commercial land uses is expected to lead to improved transit service for the Study Area and correspondingly ridership growth.

6.4 Car-Share

The Co-operative Auto Network (CAN) and Zip car, and car2go car share programs currently have no vehicles within 500 m of the site. However, their coverage is expanding from core areas in Vancouver and North Vancouver as demand of car sharing increases over time.

6.5 Transportation Demand Management (TDM)

To promote transit use the developer is encouraged to:

- Display transit routes schedules and maps for Marine Drive bus routes on residential and commercial bulletin boards and internet web pages; and,
- Retain and improve the bus stop (bus shelter, benches) along the Marine Drive frontage.

To encourage cycling the developer is encouraged to:

- Provide ample at-grade bicycle parking along all of the development's frontages.

4 "San Francisco's Shared Lane Pavement Markings: Improving Bicycle Safety", February 2004

6.6 Multi-Modal Travel Assessment: Summary and Recommendations

- Promote transit options with transit information/ links on relevant development internet web pages and within the developments residential and commercial bulletin boards.
- The site is very well serviced by public transit. Between 18 to 30 buses service the site in both the west and east directions on Marine Drive during peak activity periods.
- If required the developer could consider incentive programs for transit use to increase sustainable mode splits.
- Foster walking and cycling modal splits by protecting and enhancing the pedestrian and cycling connections between the site and the Marine Drive frontage and also with the waterfront area towards the south.
- Provide convenient, accessible and visible bike parking on all frontages of the development block.
- Cycling provisions aimed at increasing cycling modal split be applied to Bellevue Avenue, Argyle Avenue and the Spirit Trail all to the south of the site.
- Sharrows can be added to the right eastbound lane of Marine Drive in order to create motorist awareness that the lane is to be shared with cyclists. The sharrows would be used to encourage motorist not to attempt in-lane passing of cyclists due to narrow lane width.
- Recent improvements to the Marine Drive corridor, particularly in the eastbound direction toward the Lions Gate Bridge have resulted in considerably improved transit travel times. This improvement is expected to increase the transit mode split, both for existing and future residents and employees in the area.
- The multi-use synergy of land uses can be expected to lead to improved transit service for the Study Area and correspondingly ridership growth.
- Consider the provision of parking spaces for car share program use.

7. SUMMARY

7.1 Traffic Impact

- The observed Weekday AM and PM and Saturday mid-day peak hour periods were from 9 to 10 AM and 3 to 4 PM during the peak Weekday periods and between 2:30 and 3:30 PM during the Saturday.
- The Study Area road network does not encounter capacity issues during the Existing peak Weekday or Saturday periods.
- The eastbound through movement at the Marine & 15th Street intersection does encounter capacity issues during the Background 2027 scenario. This issue is mitigated by signal timing optimization.
- The modelled development is expected to generate a maximum net trip increase by 22 (4 in and 18 out) vehicle trips in the weekday AM peak hour, 98 trips (51 in and 47 out) in the Weekday PM peak hour and by 136 (74 in and 62 out) trips during the Saturday mid-day peak hour.
- Each of the Study Area capacity issues were found to occur in both the future total and future background scenarios. The issues flagged by Synchro were at the Marine & 15th intersection (eastbound through) and the Marine & 13th intersection (westbound left & eastbound through).
- With signal split optimization and the addition of an eastbound Marine Drive advance signal phase at the Marine & 15th Street intersection all intersection in the Study Area are expected to operate within capacity during all time periods in the horizon Total 2027.
- Northbound queues on 13th Street adjacent to the development block are expected to potentially interfere with access movements out of the development site. Hence a right-in only configuration may be best suited to this location.
- It is recommended that after Phase 1 development of the 1300 Block project, the District should consider adding a traffic signal to the Bellevue & 13th Street intersection together with a reconfiguration of the intersection to become a simple “T intersection”. This would require a relocation of the existing rail crossing from the 13th Street alignment to a point approximately 65 metres to the east closer to the gate entrance to Rutledge Field.

- Traffic operations in the adjacent road network area are not expected to encounter capacity issues due to the proposed development. Potential issues are largely a product of background traffic growth on Marine Drive. The examined intersections on Marine Drive demonstrate the ability to accommodate the increased traffic levels with traffic signal optimization.
- Mixed-use development such as this proposed development can be expected to have a positive impact on future mode split trends.
- We suggest that parking along Bellevue Avenue's south side be at 45 degrees with the Bunt recommended minimum dimensions (shown in Exhibit 16).

7.2 Parking

- The immediate parking area has a total of 102 on-street parking spaces (including 1300 block Argyle), and 44 on-site spaces.
- On-street parking in the area is currently highly occupied during peak periods. This is projected to continue due to potential shortfall at the playing fields of approximately 15 spaces.
- The proposed development at build-out provides 29 spaces above bylaw. 14 of these extras spaces are for the residential component and 15 are from the commercial components.
- The 14 extra residential spaces are a product of large unit size and the desire to provide garage style parking spaces. The flex use ability of the extra garage style parking spaces is expected to lower vehicle ownership rates as the extra space can be used for storage or other use.
- The extra 15 commercial spaces are in excess of expected on-site development demand. Their presence is generally welcome as they may help relieve an existing parking shortfall in the area.
- The publically available on-street parking supply on the adjacent roads (1300 block Marine, 1300 Block Bellevue, on 14th Street adjacent to the site and 1300 block Argyle) will increase by 5 parking spaces over current supply. The 5 on-street parking space increase is on Bellevue.
- We would encourage the developer to actively promote transit use, provide higher than bylaw bicycle parking and donate two parking spaces to potential car share vehicles. Suggested methods for promoting non-vehicle modes of transportation were presented in Section 5.5.

7.3 Multi-Modal Travel Assessment

- Promote transit options with transit information/ links on relevant development internet web pages and within the developments residential and commercial bulletin boards.
- The site is extremely well connected with bus transit. An estimated 18 to 30 buses service the site during peak traffic periods in both the west and east directions on Marine Drive.

- If required the developer could consider incentive programs for transit use or increased parking pricing schemes to increase sustainable mode splits.
- The developer is encouraged to foster walking and cycling modal splits by protecting and enhancing the pedestrian and cycling connections between the site and the Marine Drive frontage and also with the waterfront area towards the south.
- The developer is encouraged to provide convenient, accessible and visible bike parking on all frontages of the development block.
- It is recommended that cycling provisions aimed at increasing cycling modal split be applied to Argyle Avenue and the Spirit Trail all to the south of the site.
- Sharrows can be added to the right eastbound lane of Marine Drive in order to create motorist awareness that the lane is to be shared with cyclists. The sharrows would be used to encourage motorist not to attempt in-lane passing of cyclists due to narrow lane width.
- Recent improvements to the Marine Drive bridge over the Capilano bridge have resulted in improved bus queue hop lanes. This improvement is expected to increase the transit mode split.
- The multi-use synergy of land uses can be expected to lead to improved transit service for the Study Area and correspondingly ridership growth.
- Consider the provision of parking spaces for future car share program use.

APPENDIX A

WEEKDAY AM PEAK HOUR TRAFFIC VOLUMES

1300 Block Marine Dr.

West Vancouver

AM Peak Hour: 9am to 10am

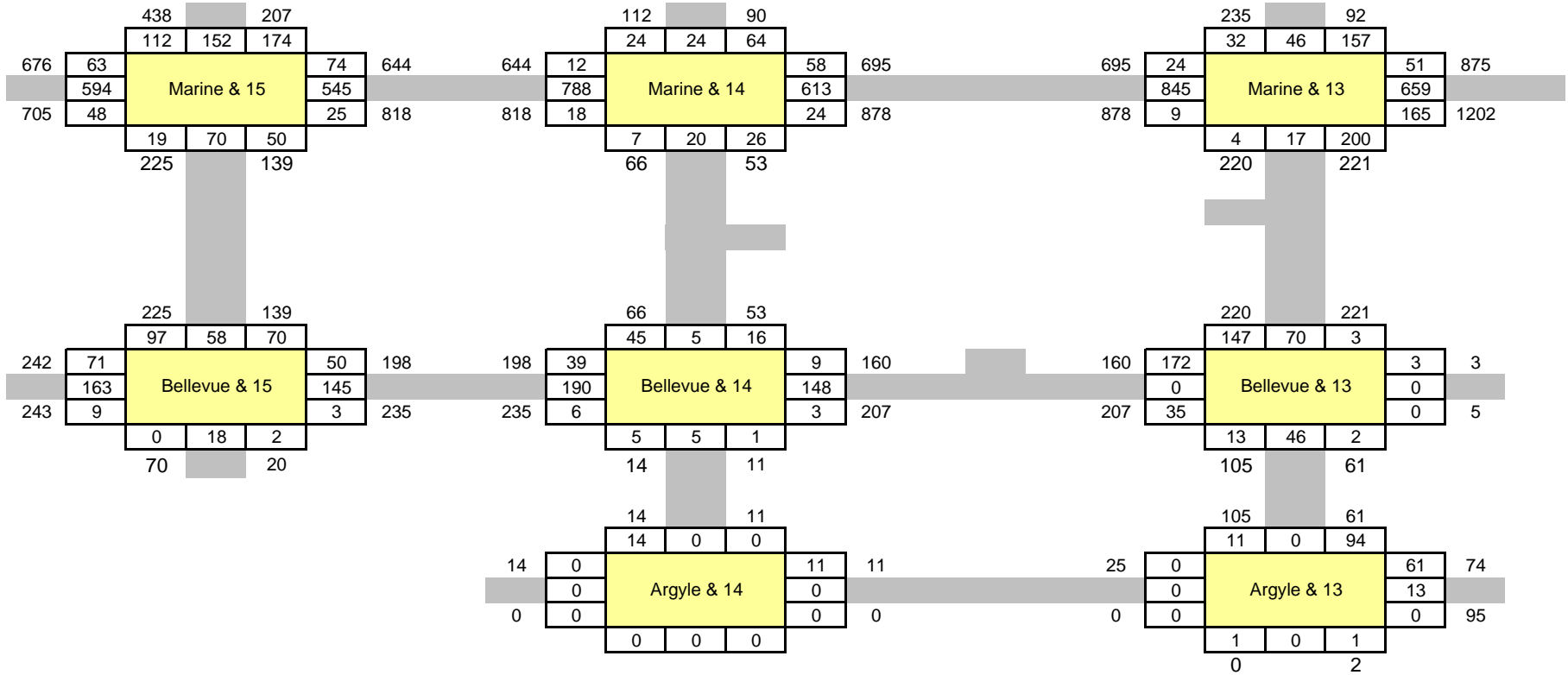
4275

1300 Block Redevelopment

West Vancouver

Traffic Count Data: Thursday June 9, 2011

Appendix A: Weekday AM



1300 Block Marine Dr.

West Vancouver

Other Developments, 2015

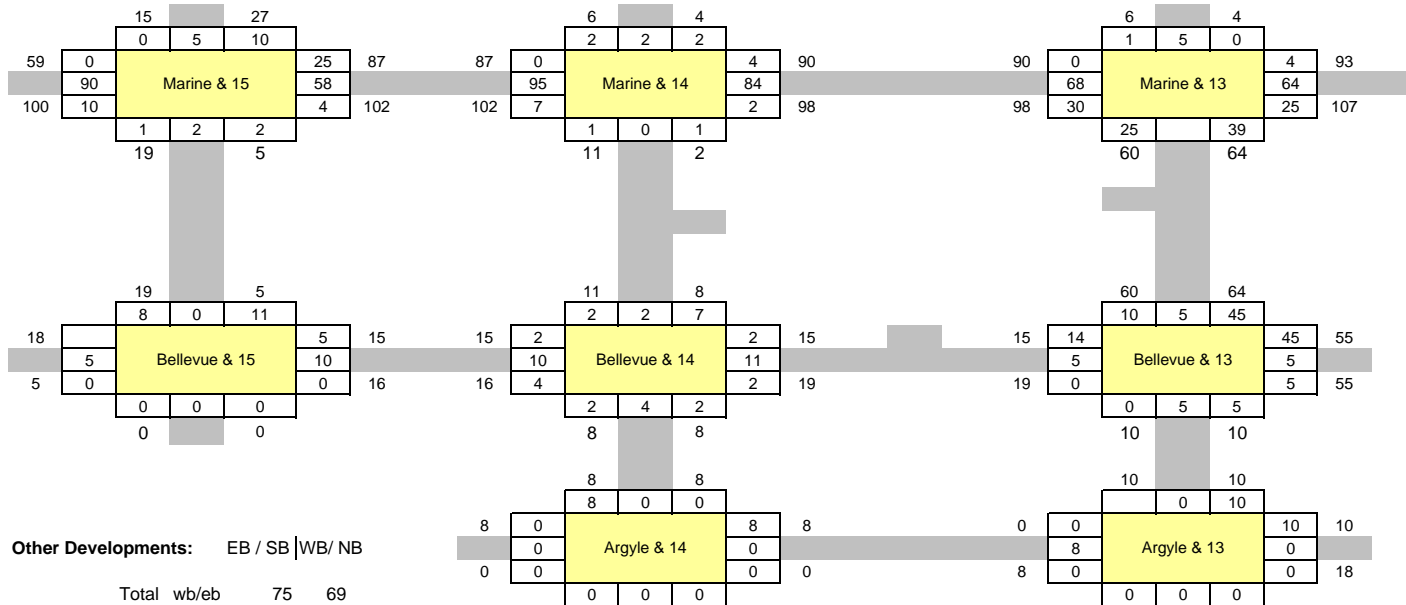
AM Peak Hour: 9am to 10am

4275

1300 Block Redevelopment

West Vancouver

Appendix A: Weekday AM



Other Developments: EB / SB | WB/ NB

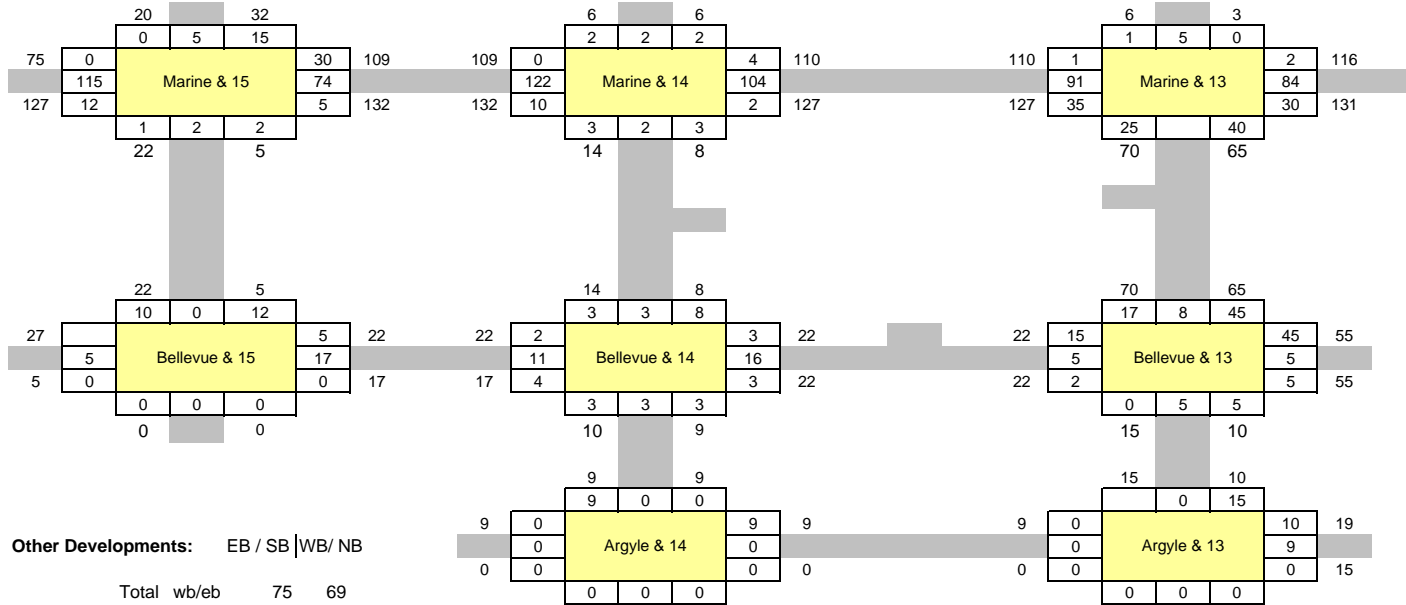
Total	wb/eb	75	69
	nb/sb	7	15
	Total	166	
Playing fields	110	55 in and 55 out, distributed according to existing patterns	
TOTAL	276		

1300 Block Marine Dr.

West Vancouver
 Other Developments, 2027
 Long Term

AM Peak Hour: 9am to 10am
 4275
 1300 Block Redevelopment
 West Vancouver

Appendix A: Weekday AM



Other Developments: EB / SB | WB/ NB

Total	wb/eb	75	69
	nb/sb	7	15
	Total	166	
Playing fields		110	55 in and 55 out, distributed according to existing patterns

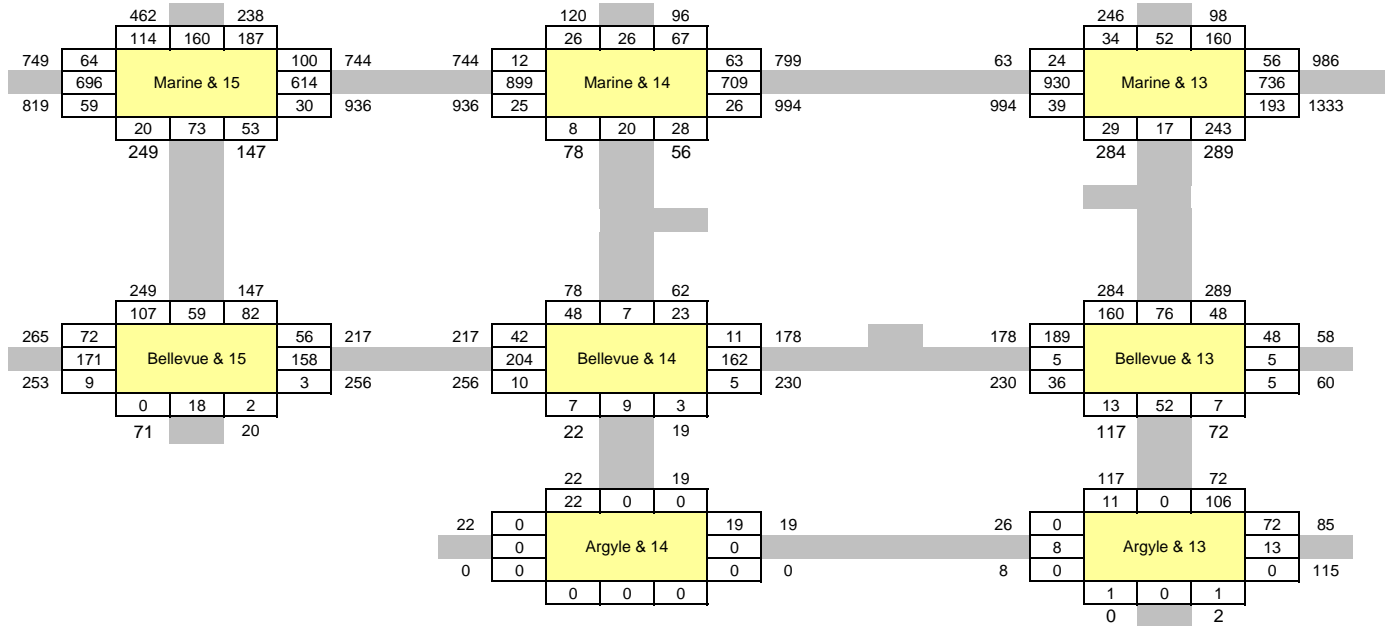
1300 Block Marine Dr.

West Vancouver
Background 2015

AM Peak Hour: 9am to 10am
4275
1300 Block Redevelopment
West Vancouver

Growth Rate
Growth Factor

Appendix A: Weekday AM
0.5%
1.020



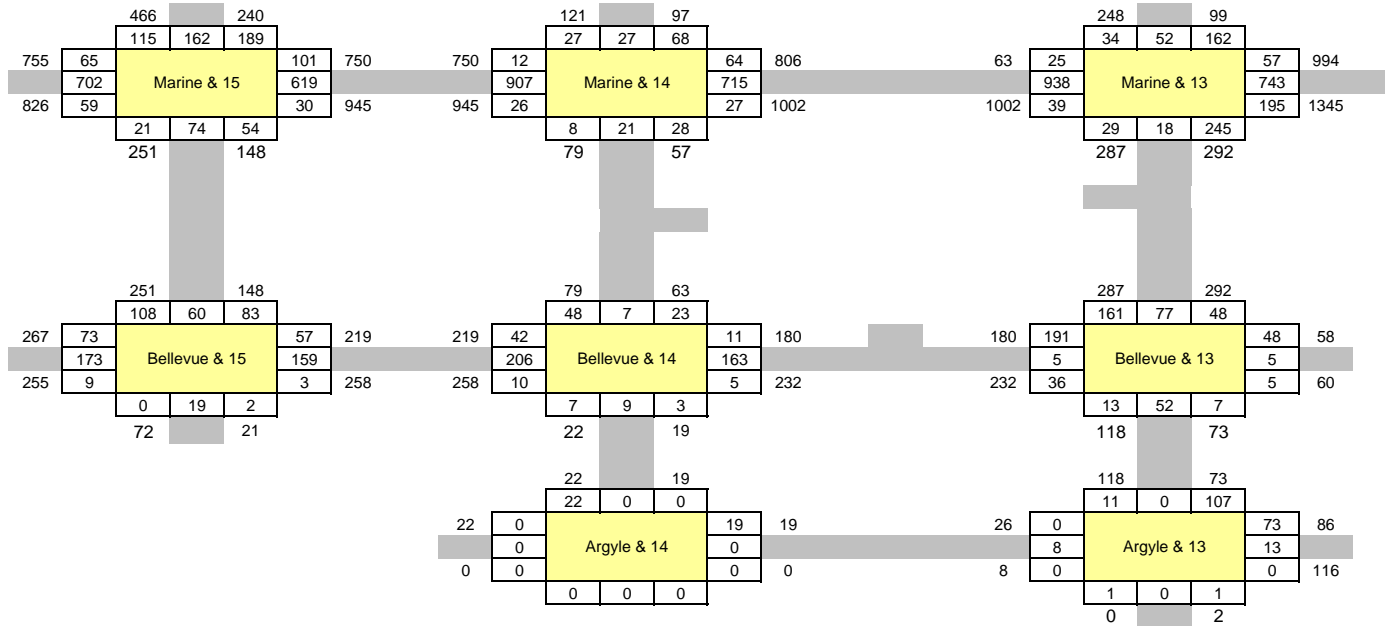
1300 Block Marine Dr.

West Vancouver
Background 2017

AM Peak Hour: 9am to 10am
4275
1300 Block Redevelopment
West Vancouver

Growth Rate
Growth Factor

Appendix A: Weekday AM
0.5%
1.030



1300 Block Marine Dr.

West Vancouver

Background 2027

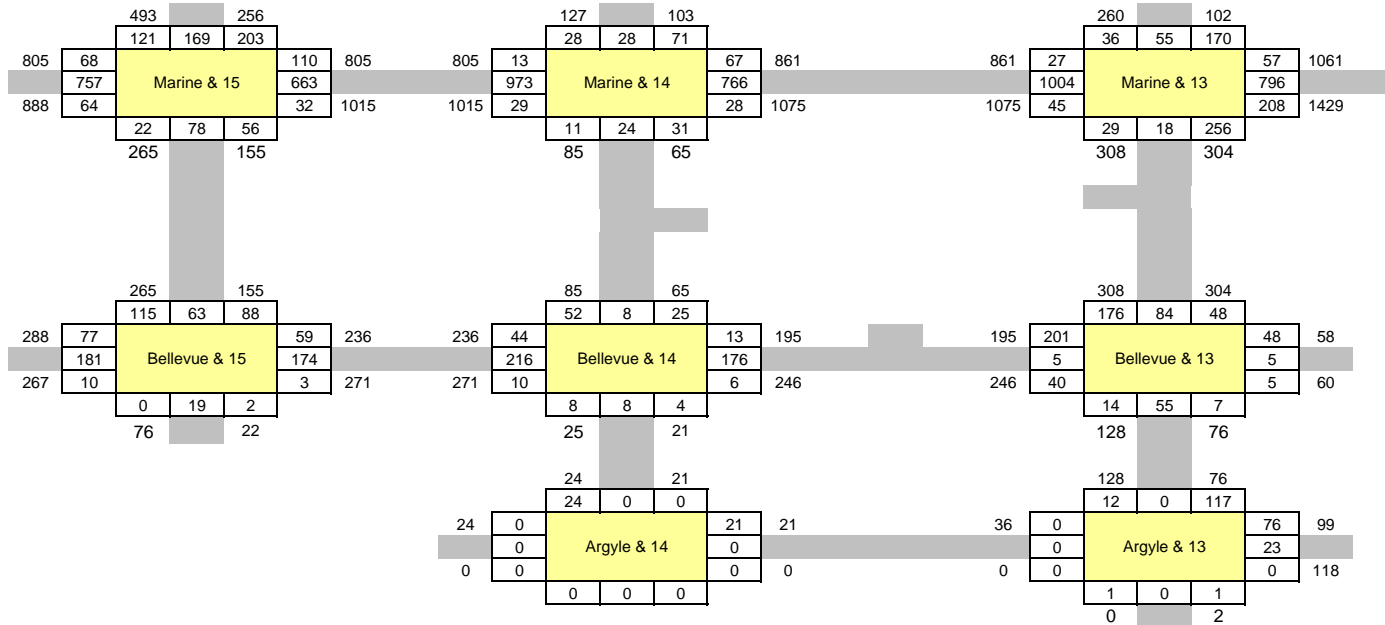
AM Peak Hour: 9am to 10am

4275
1300 Block Redevelopment
West Vancouver

Growth Rate
Growth Factor

Appendix A: Weekday AM

0.5%
1.080



1300 Block Marine Dr.
West Vancouver

2015 Development Volumes
Phase 1

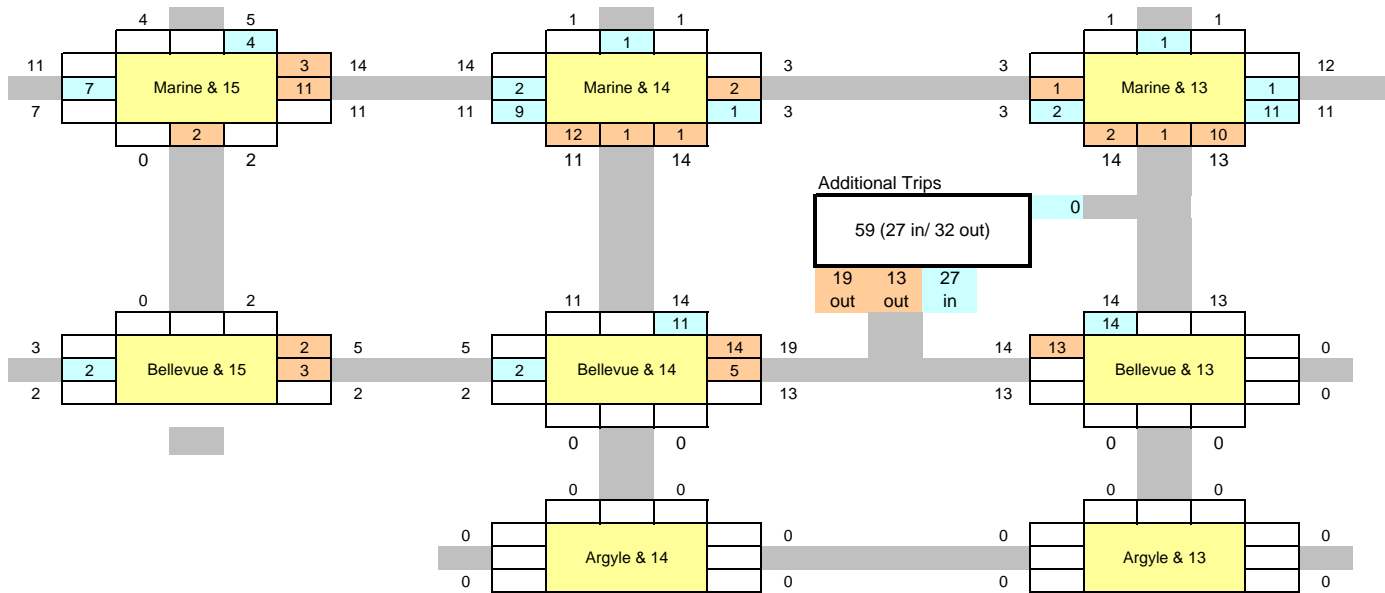
AM Peak Hour: 9am to 10am
4275

1300 Block Redevelopment
West Vancouver

Appendix A: Weekday AM

Distributions presented in Table 9

Total			59
In			27
Out			32



1300 Block Marine Dr.
West Vancouver

2017 Development Volumes
Phase 2

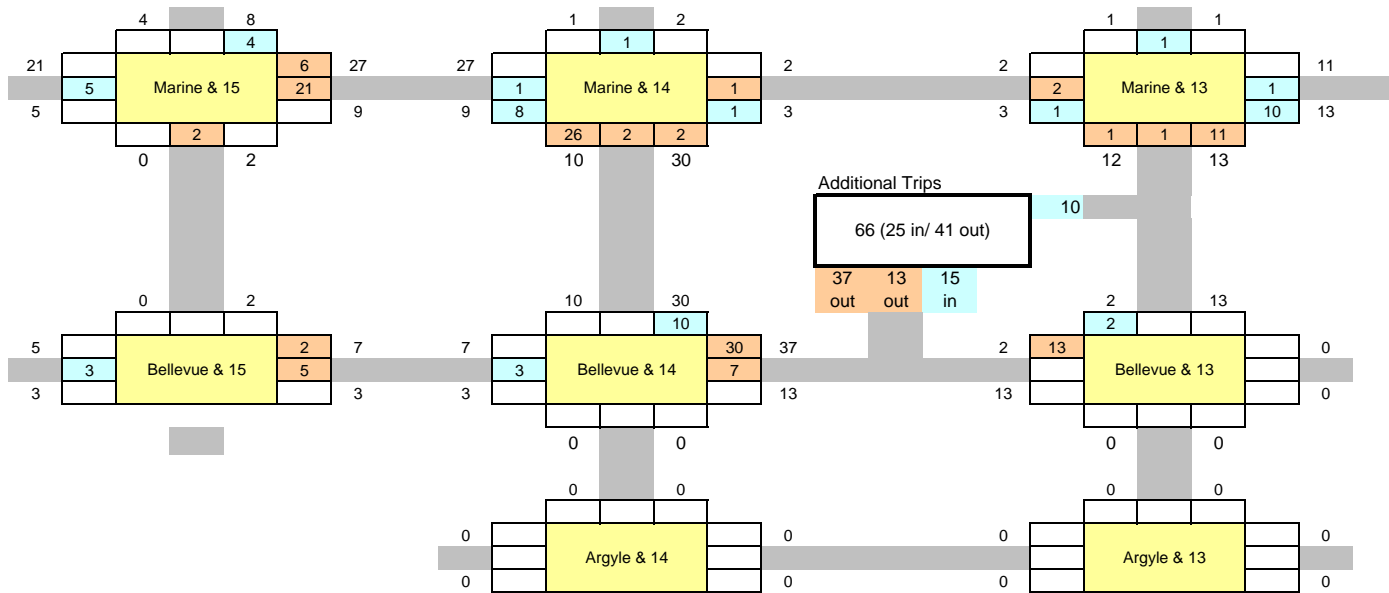
AM Peak Hour: 9am to 10am
4275

1300 Block Redevelopment
West Vancouver

Appendix A: Weekday AM

Distributions presented in Table 9

Total			66
In			25
Out			41



1300 Block Marine Dr.

West Vancouver

Total 2015

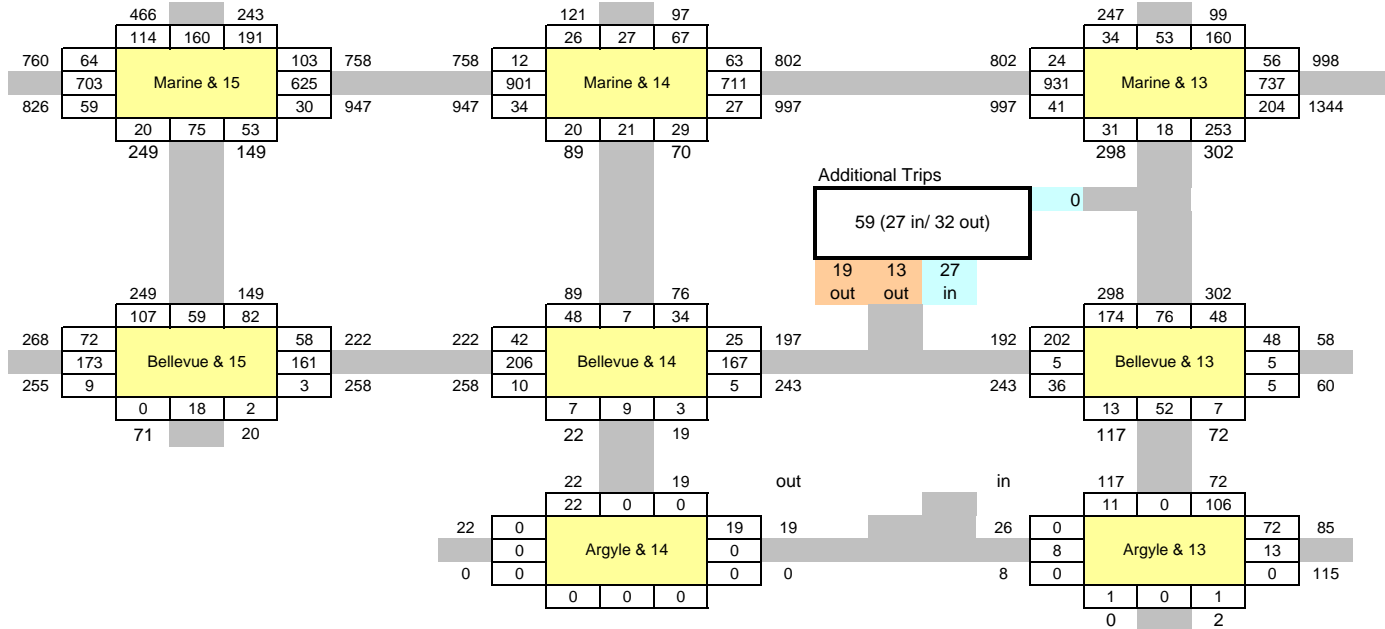
AM Peak Hour: 9am to 10am

4275

1300 Block Redevelopment

West Vancouver

Appendix A: Weekday AM



1300 Block Marine Dr.

West Vancouver

Total 2027

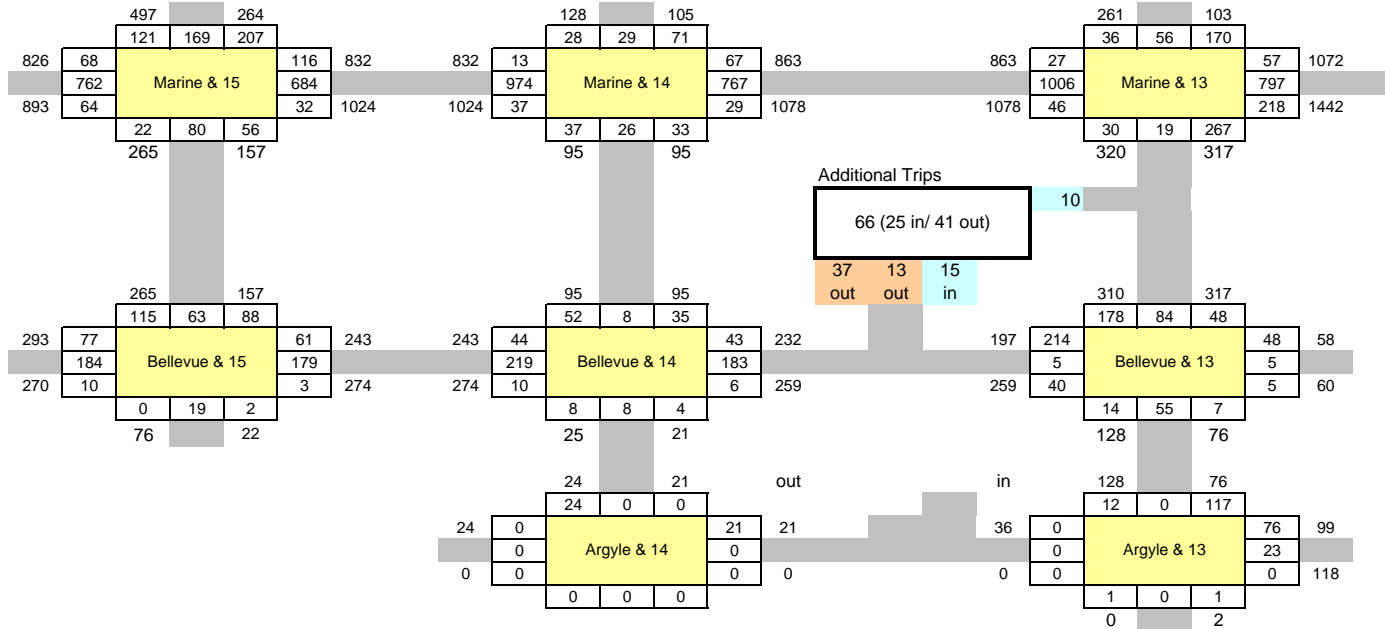
AM Peak Hour: 9am to 10am

4275

1300 Block Redevelopment

West Vancouver

Appendix A: Weekday AM





APPENDIX B

WEEKDAY PM PEAK HOUR TRAFFIC VOLUMES

1300 Block Marine Dr.

West Vancouver

PM Peak Hour: 3pm to 4pm

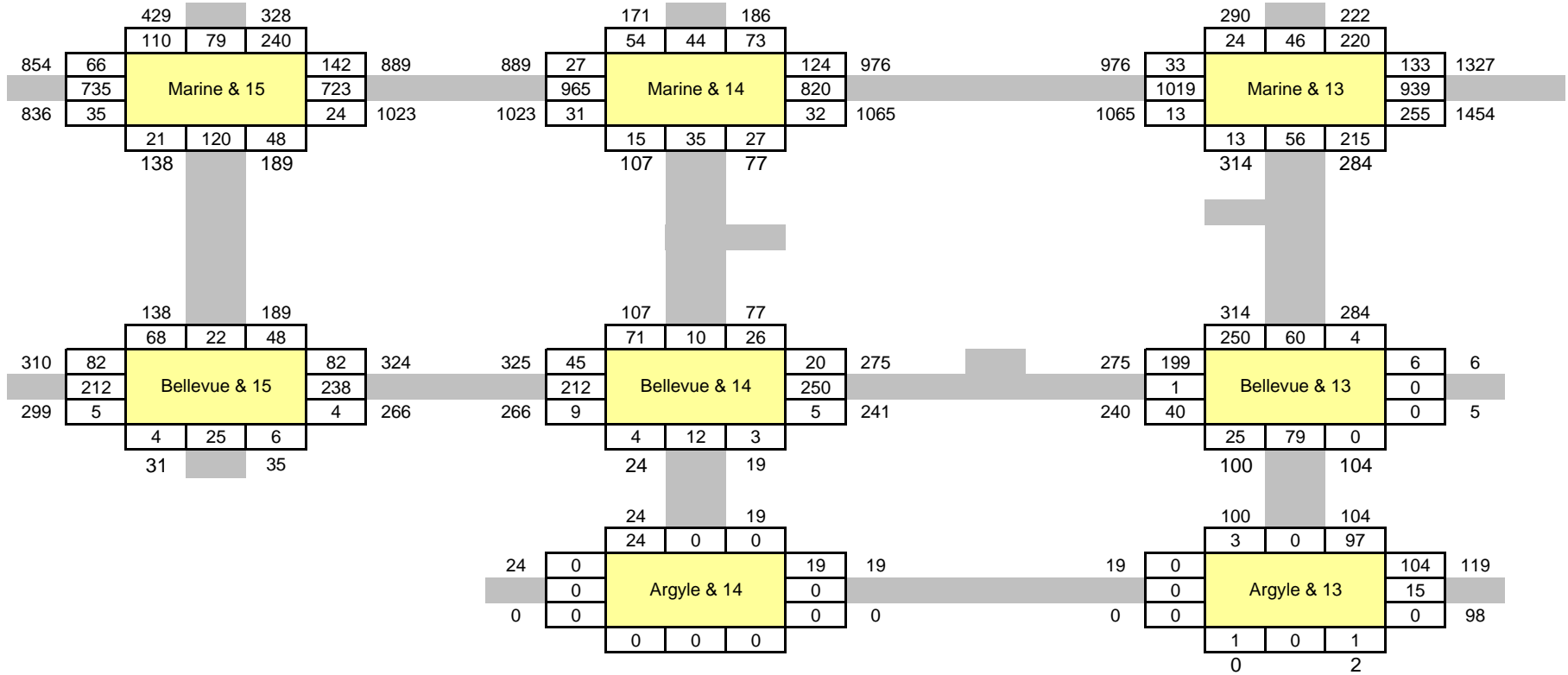
4275

1300 Block Redevelopment

West Vancouver

Traffic Count Data: Thursday June 9, 2011

Appendix B: Weekday PM



1300 Block Marine Dr.

West Vancouver

Other Developments, 2015

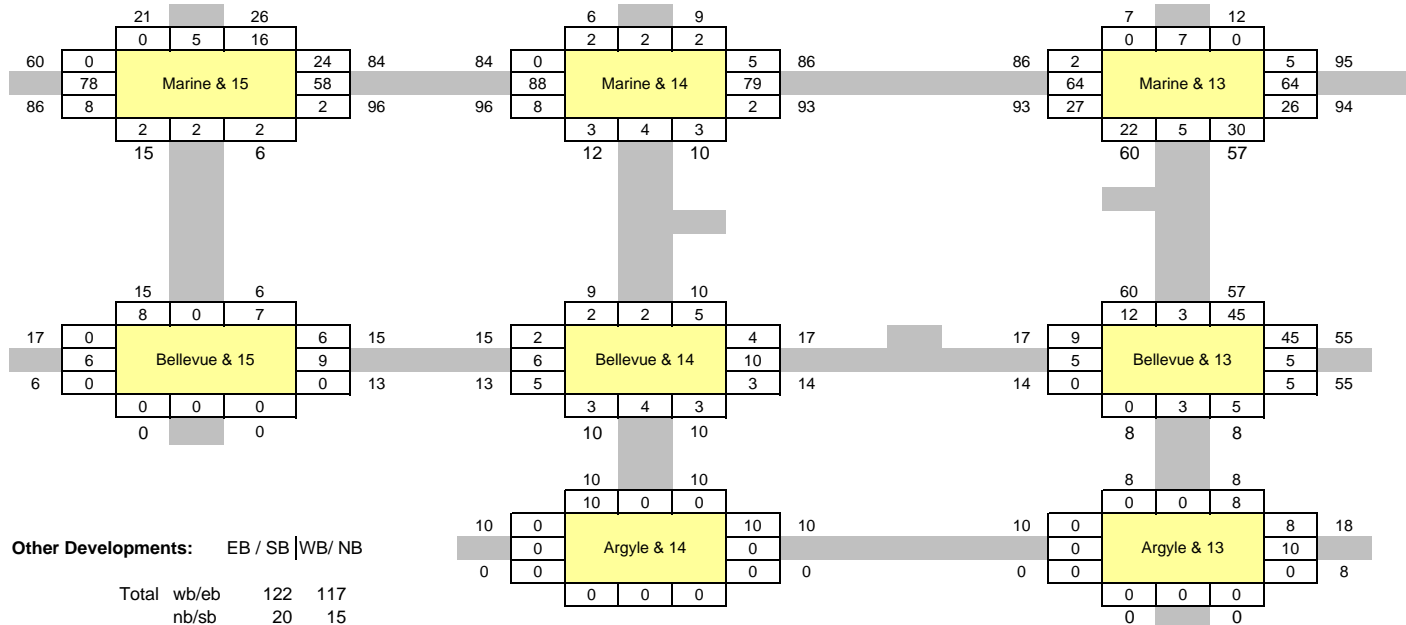
PM Peak Hour

4275

1300 Block Redevelopment

West Vancouver

Appendix B: Weekday PM



Other Developments: EB / SB | WB/ NB

Total	wb/eb	122	117
	nb/sb	20	15
	Total	274	
Playing Field:	110	55 in and 55 out	

1300 Block Marine Dr.

West Vancouver

Other Developments, 2027

Long Term

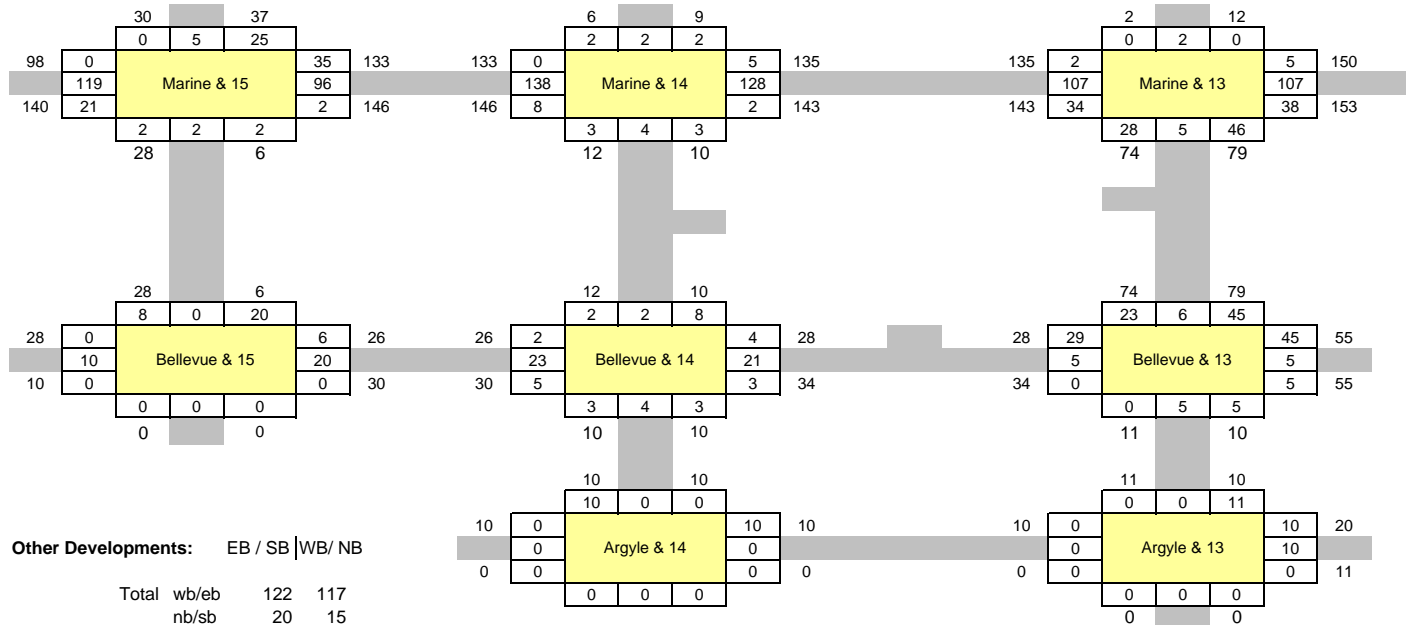
PM Peak Hour

4275

1300 Block Redevelopment

West Vancouver

Appendix B: Weekday PM



Other Developments: EB / SB | WB/ NB

Total	wb/eb	122	117
	nb/sb	20	15
	Total	274	
Playing Field:	110	55 in and 55 out	
	68	Long term Park Royal Res.	

1300 Block Marine Dr.

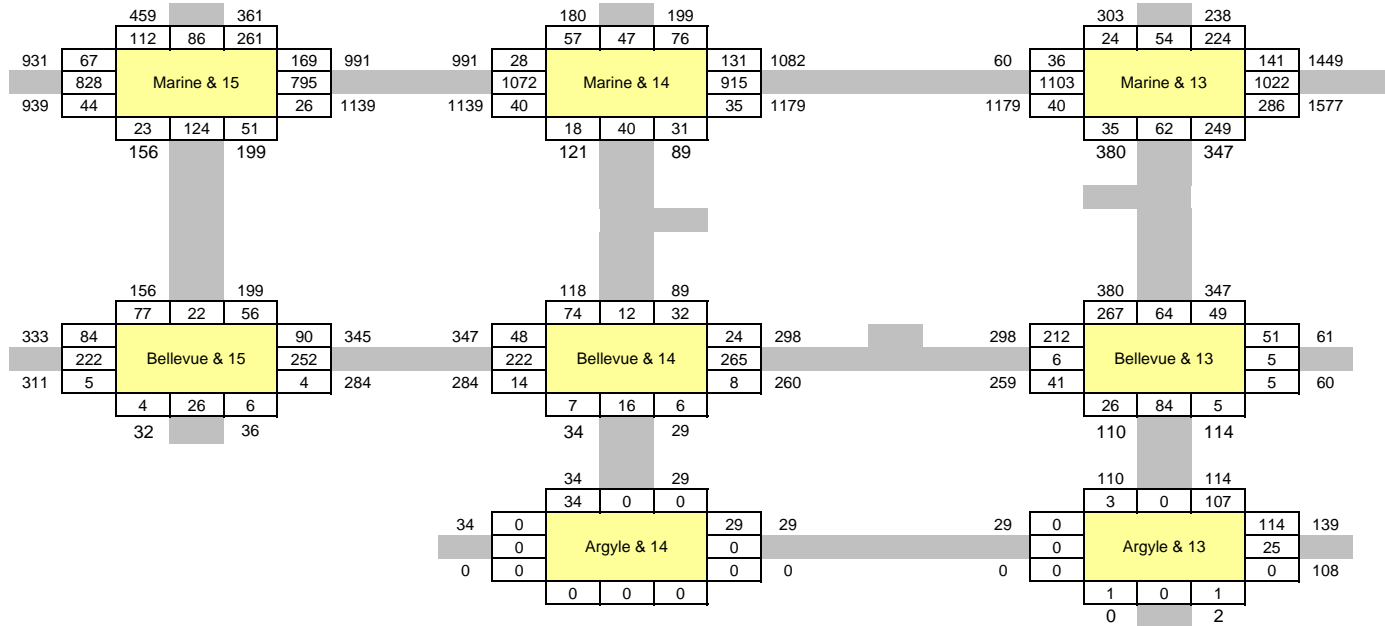
West Vancouver
Background 2015

PM Peak Hour

4275
1300 Block Redevelopment
West Vancouver

Appendix B: Weekday PM

Growth Rate 0.5%
Growth Factor 1.020



1300 Block Marine Dr.

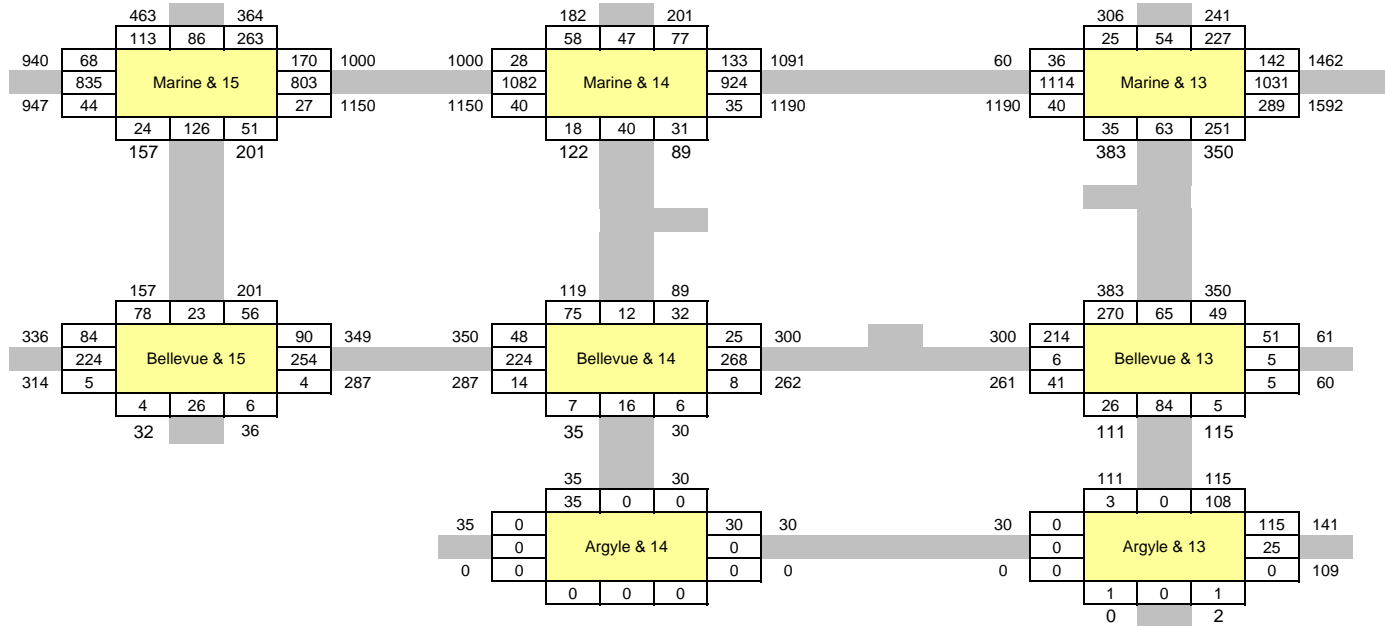
West Vancouver
Background 2017

PM Peak Hour

4275
1300 Block Redevelopment
West Vancouver

Appendix B: Weekday PM

Growth Rate 0.5%
Growth Factor 1.030



1300 Block Marine Dr.

West Vancouver

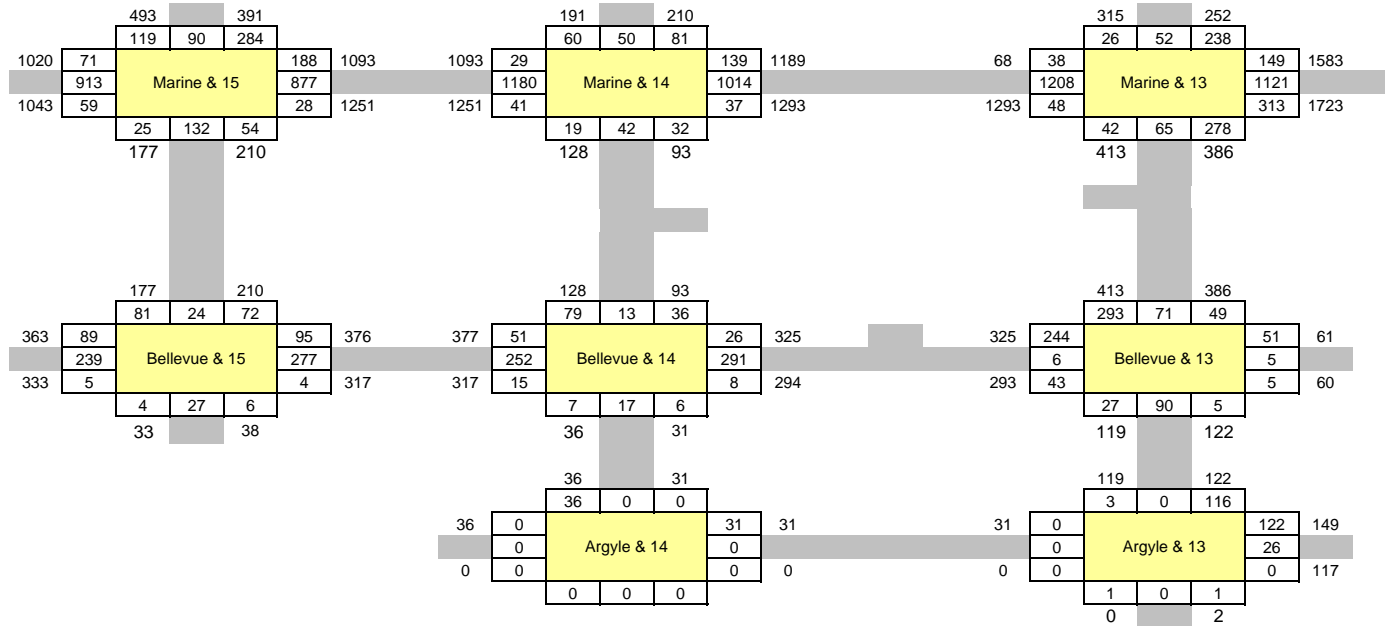
Background 2027

PM Peak Hour

4275
1300 Block Redevelopment
West Vancouver

Appendix B: Weekday PM

Growth Rate 0.5%
Growth Factor 1.080



1300 Block Marine Dr.
West Vancouver

2015 Development Volumes
Phase 1

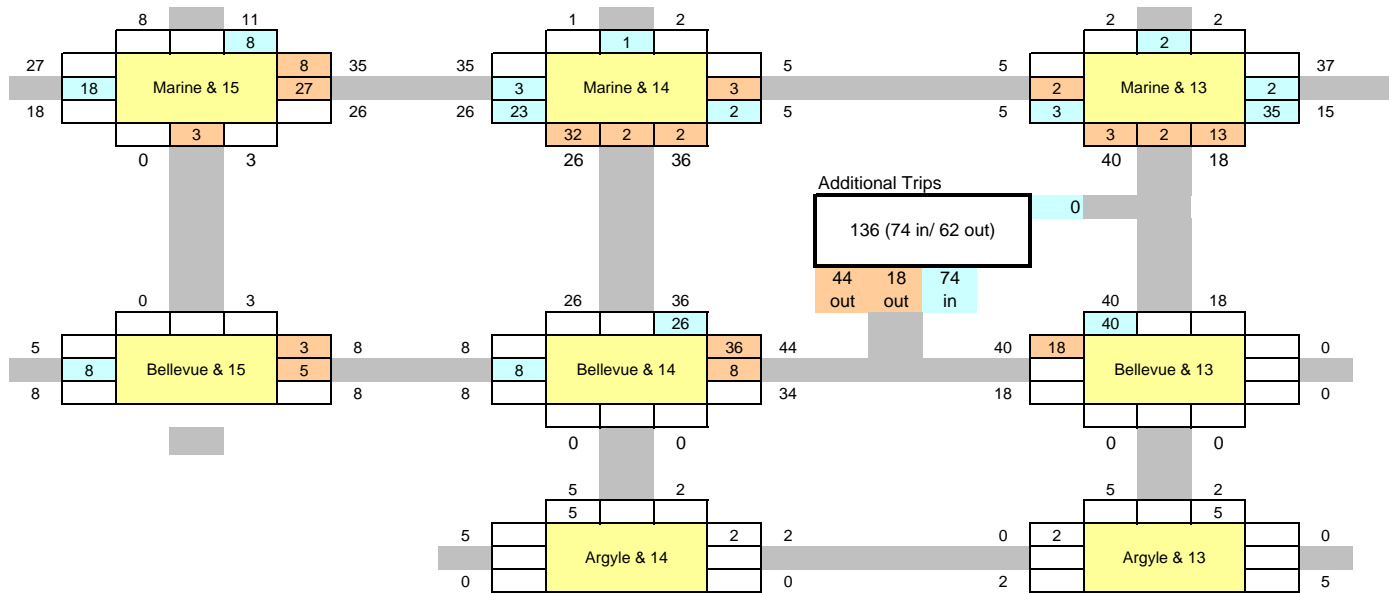
PM Peak Hour
4275

1300 Block Redevelopment
West Vancouver

Appendix B: Weekday PM

Total			136
In			74
Out			62

Distributions presented in Table 9



1300 Block Marine Dr.
West Vancouver

2017 Development Volumes
Phase 2

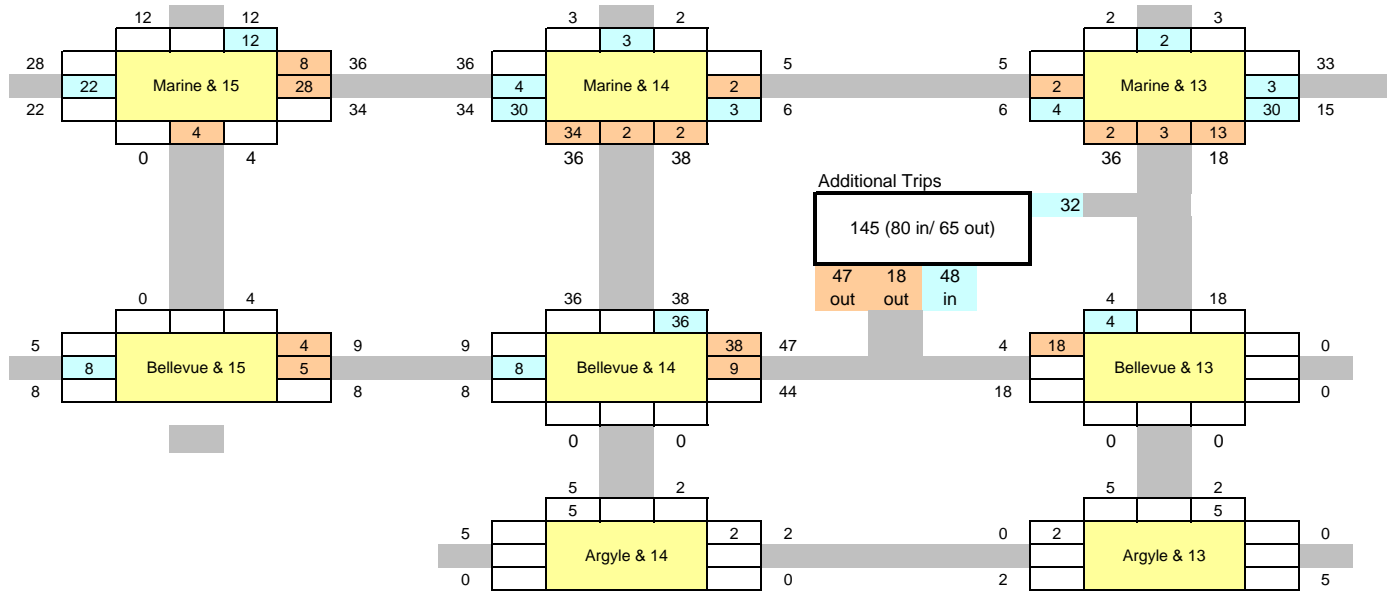
PM Peak Hour
4275

1300 Block Redevelopment
West Vancouver

Appendix B: Weekday PM

Total			145
In			80
Out			65

Distributions presented in Table 9



1300 Block Marine Dr.

West Vancouver

Total 2015

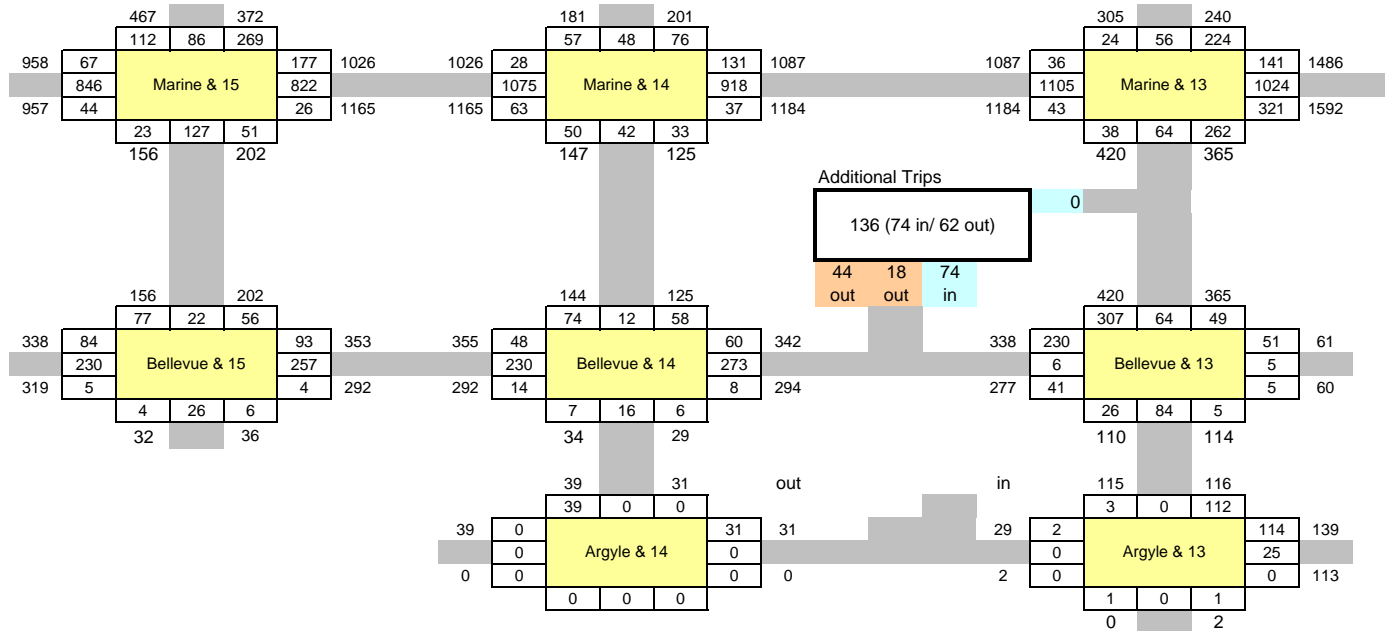
PM Peak Hour

4275

1300 Block Redevelopment

West Vancouver

Appendix B: Weekday PM



1300 Block Marine Dr.

West Vancouver

Total 2017

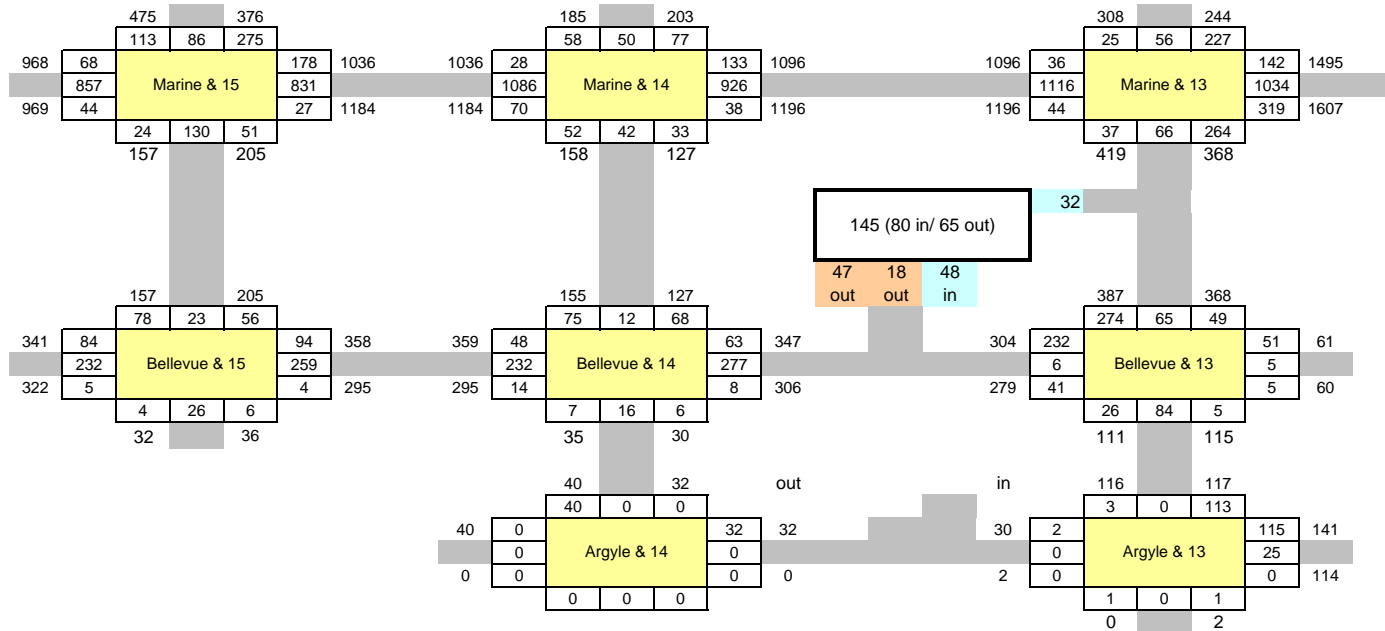
PM Peak Hour

4275

1300 Block Redevelopment

West Vancouver

Appendix B: Weekday PM



1300 Block Marine Dr.

West Vancouver

Total 2027

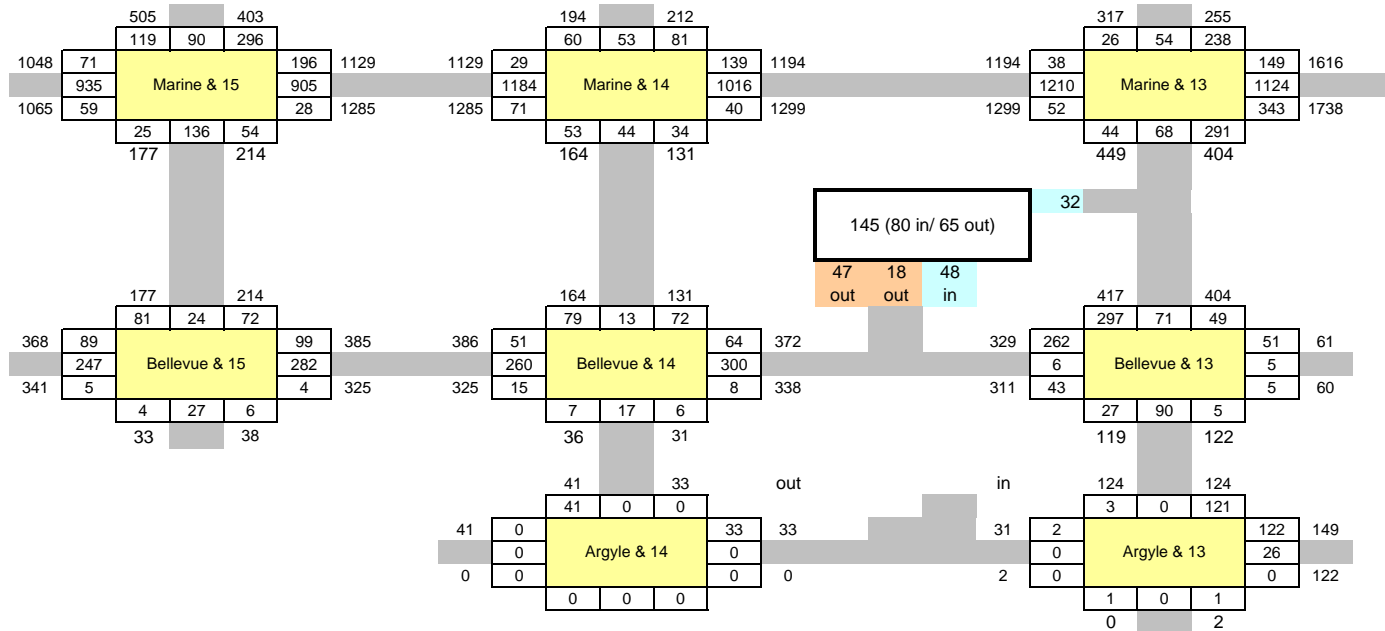
PM Peak Hour:

4275

1300 Block Redevelopment

West Vancouver

Appendix B: Weekday PM



APPENDIX C

SATURDAY PEAK HOUR TRAFFIC VOLUMES

1300 Block Marine Dr.

West Vancouver

Saturday Mid-day Peak Hour: 2:30 pm 3:30 pm

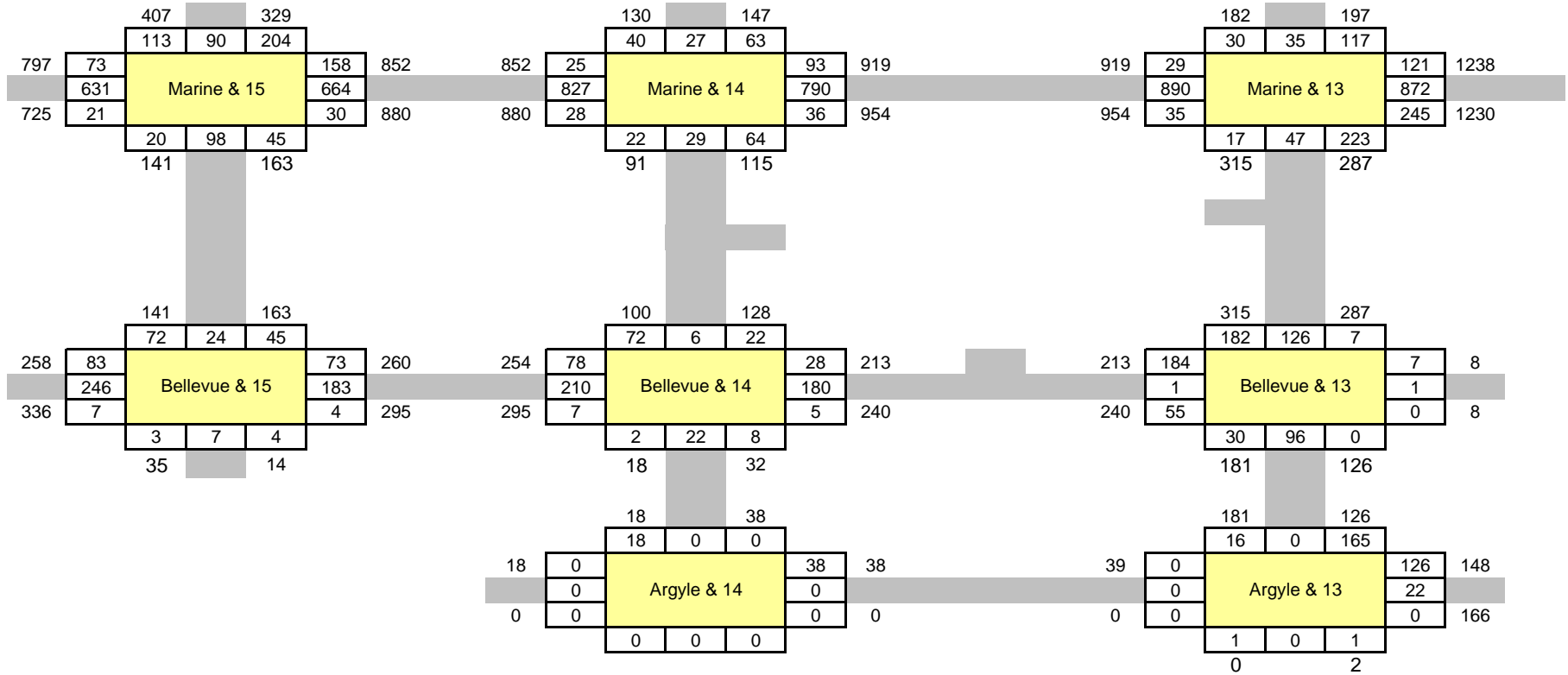
4275

1300 Block Redevelopment

West Vancouver

Traffic Count Data: Saturday June 11, 2011

Appendix C: Saturday



1300 Block Marine Dr.

West Vancouver

Other Developments, 2014

Saturday Mid-day Peak Hour: 2:30 pm 3:30 pm

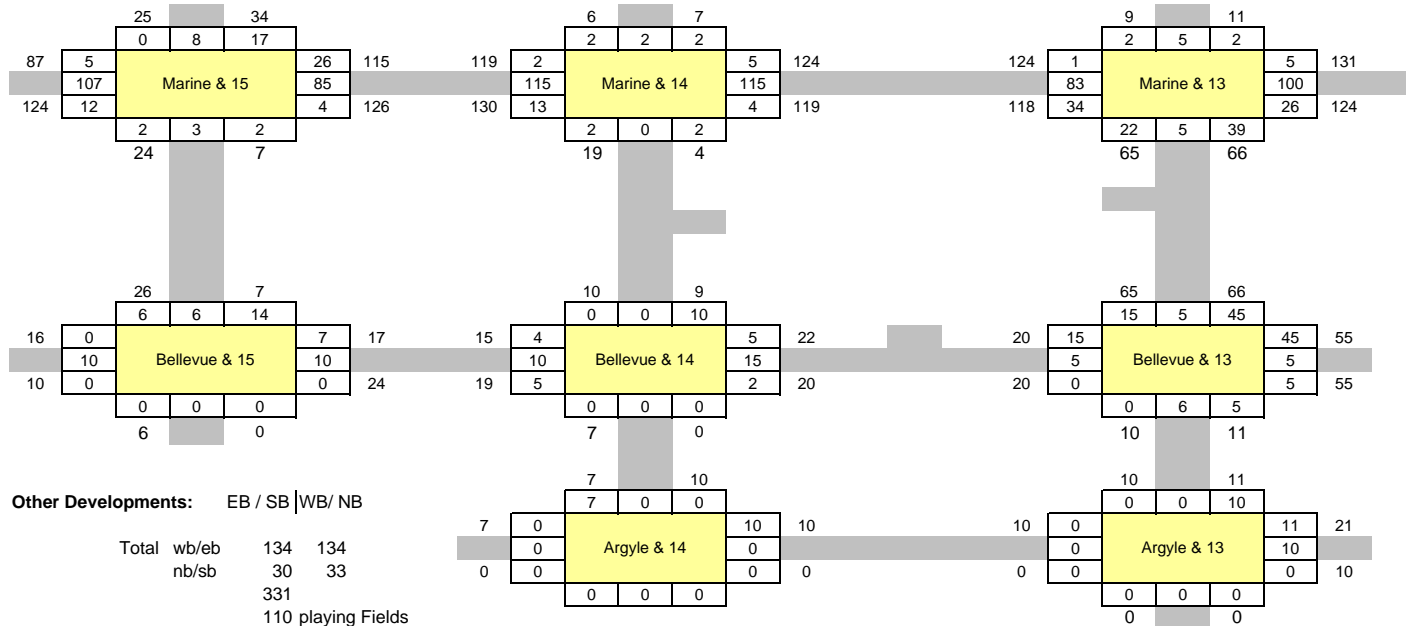
4275

1300 Block Redevelopment

West Vancouver

Traffic Count Data: Saturday June 11, 2011

Appendix C: Saturday



1300 Block Marine Dr.

West Vancouver

Other Developments, 2026

Long Term

Saturday Mid-day Peak Hour: 2:30 pm 3:30 pm

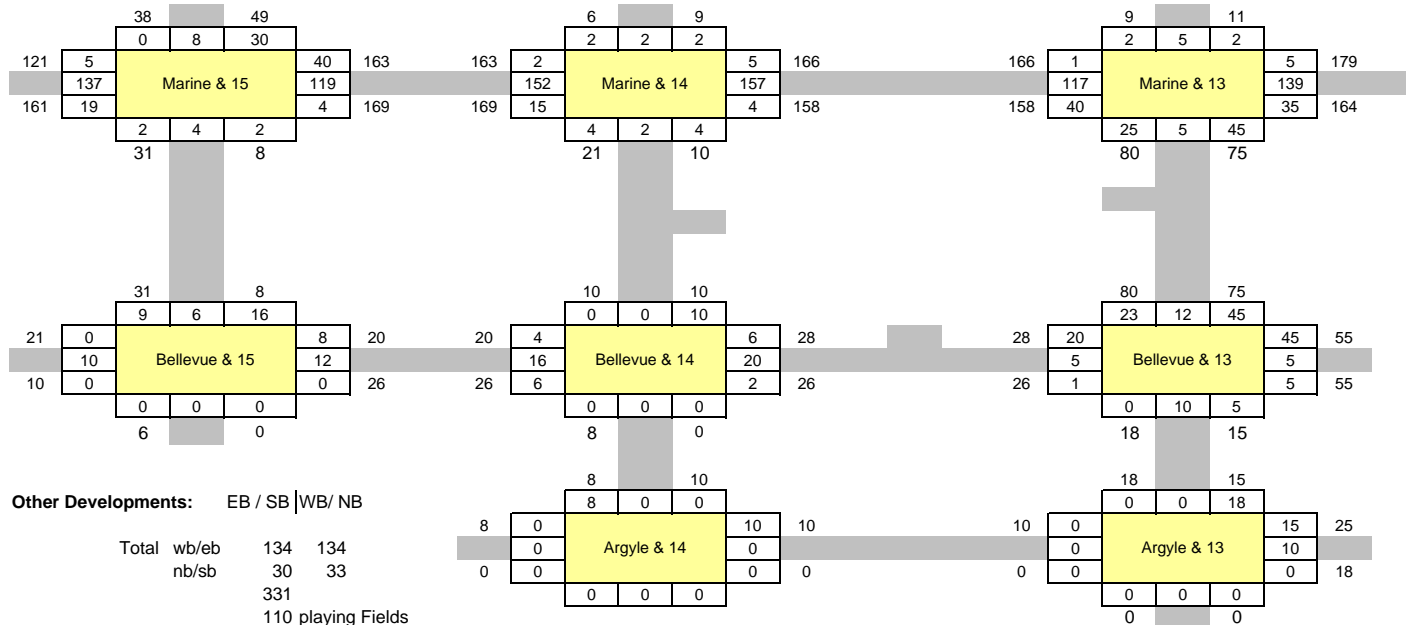
4275

1300 Block Redevelopment

West Vancouver

Traffic Count Data: Saturday June 11, 2011

Appendix C: Saturday



Other Developments: EB / SB | WB/ NB

Total	wb/eb	134	134
	nb/sb	30	33
		331	
		110	playing Fields
		61	Long Term Park Royal
		502	

1300 Block Marine Dr.

West Vancouver
Background 2014

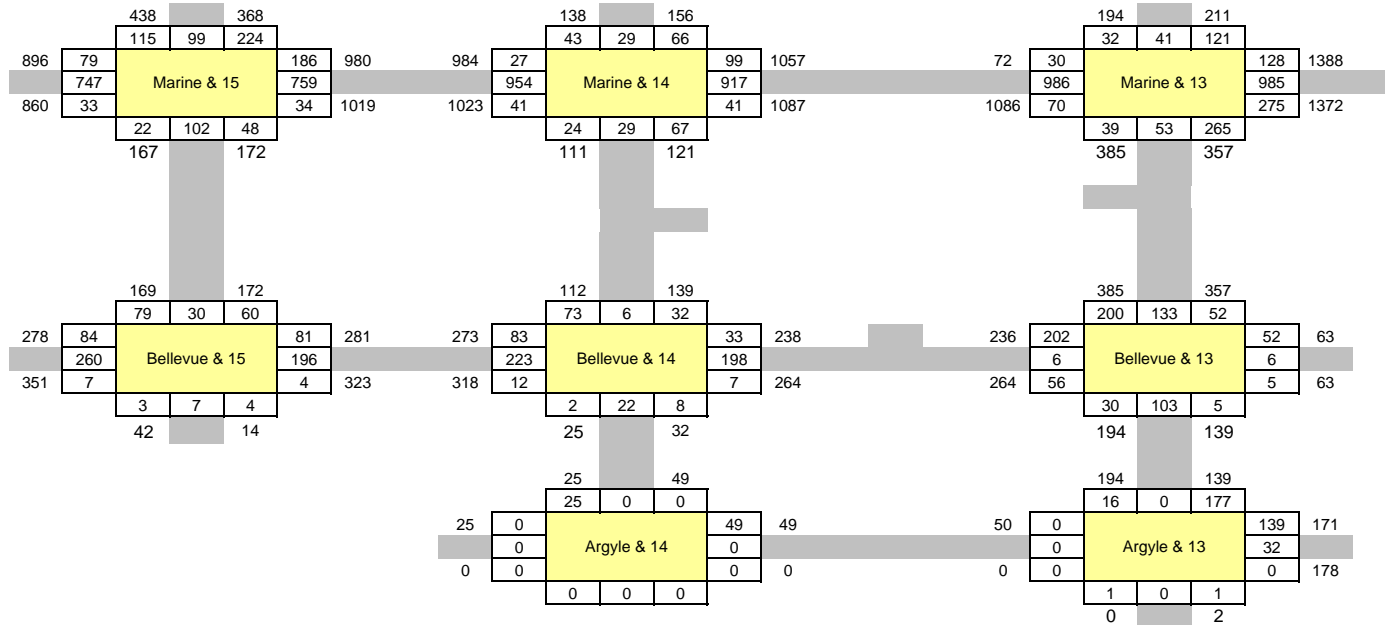
Saturday Mid-day Peak Hour: 2:30 pm 3:30 pm

4275
1300 Block Redevelopment
West Vancouver
Traffic Count Data: Saturday June 11, 2011

Growth Rate
Growth Factor

Appendix C: Saturday

0.5%
1.015



1300 Block Marine Dr.

West Vancouver
Background 2016

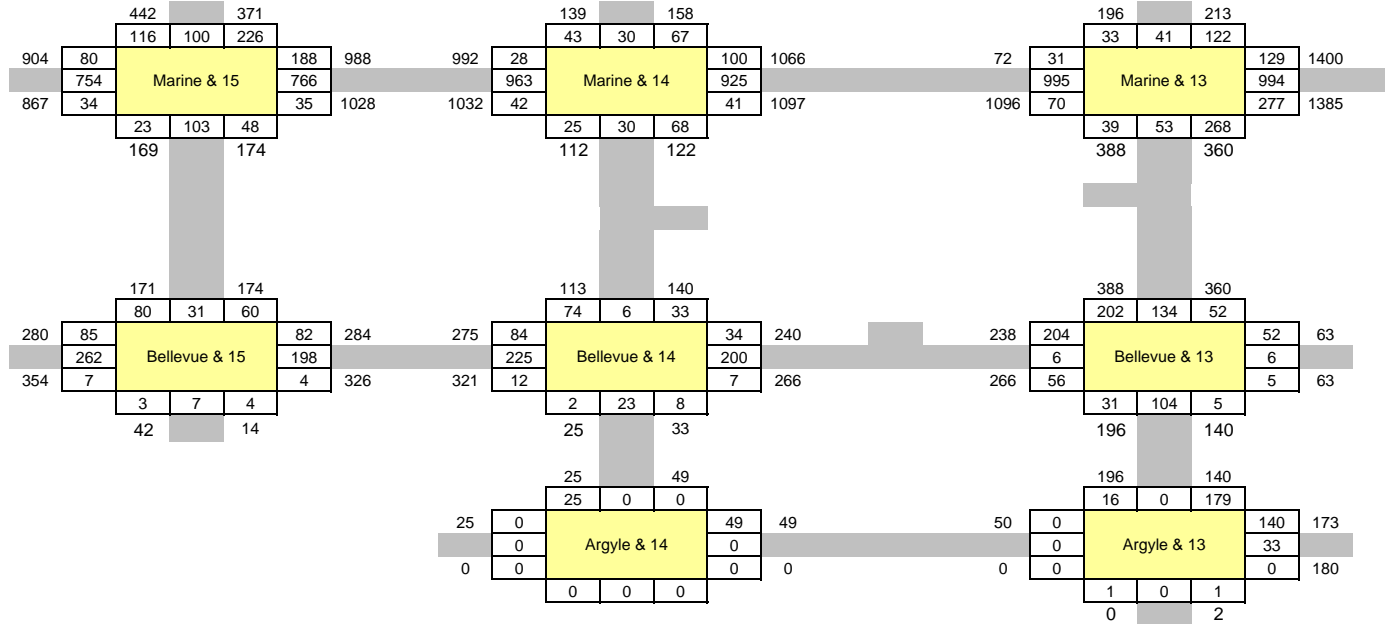
Saturday Mid-day Peak Hour: 2:30 pm 3:30 pm

4275
1300 Block Redevelopment
West Vancouver
Traffic Count Data: Saturday June 11, 2011

Growth Rate
Growth Factor

Appendix C: Saturday

0.5%
1.025



1300 Block Marine Dr.

West Vancouver

Background 2026

Saturday Mid-day Peak Hour: 2:30 pm 3:30 pm

4275

1300 Block Redevelopment

West Vancouver

Traffic Count Data: Saturday June 11, 2011

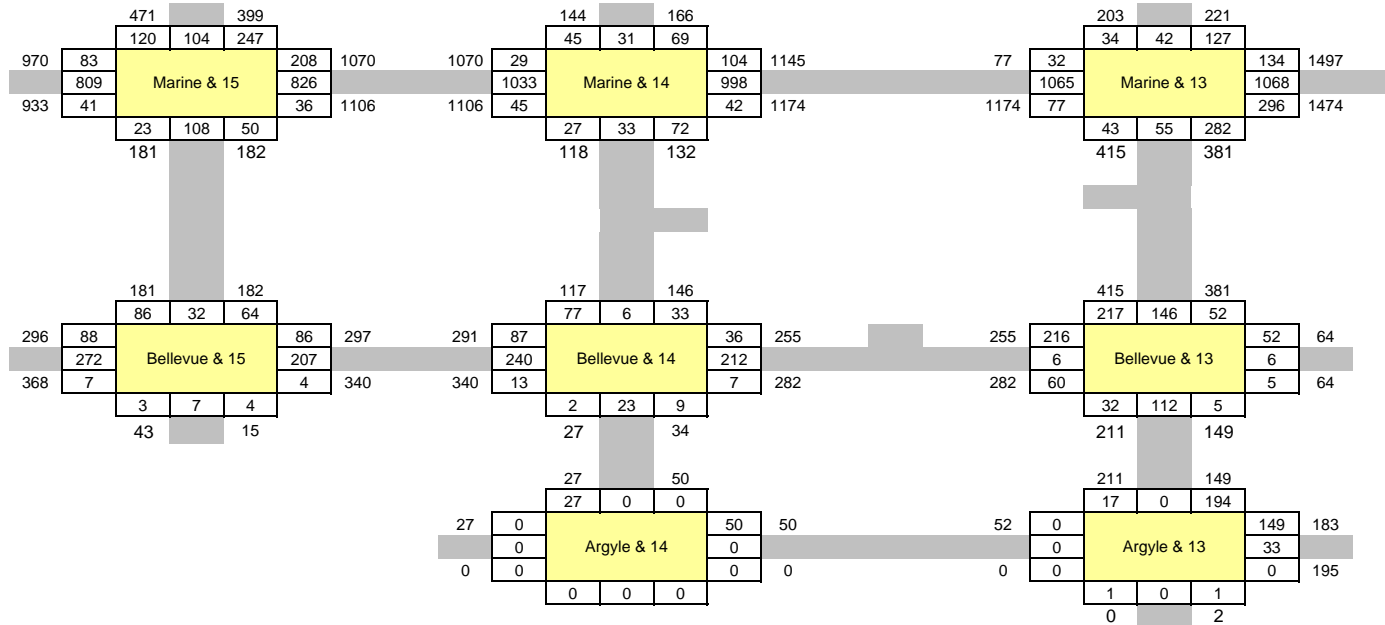
Growth Rate

Growth Factor

Appendix C: Saturday

0.5%

1.065



1300 Block Marine Dr.
West Vancouver

2014 Development Volumes
Phase 1

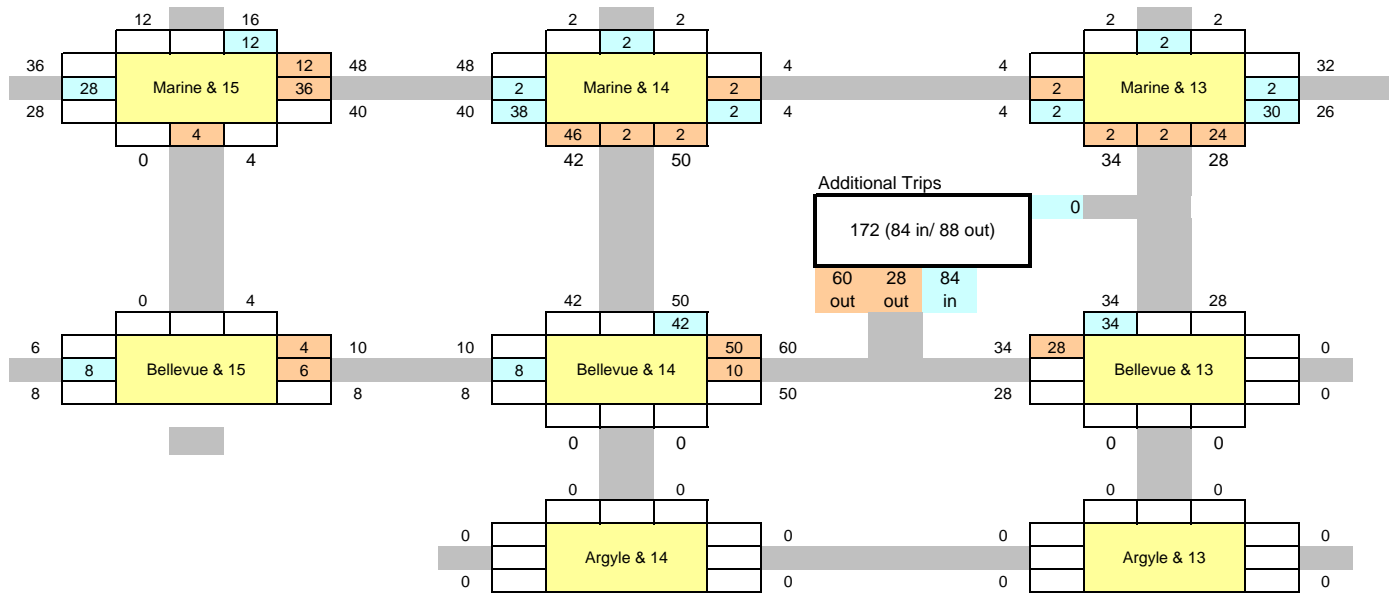
Saturday Mid-day Peak Hour: 2:30 pm 3:30 pm
4275

Appendix C: Saturday

1300 Block Redevelopment
West Vancouver
Traffic Count Data: Saturday June

Total			172
In			84
Out			88

Distributions presented in Table 9



1300 Block Marine Dr.
West Vancouver

2016 Development Volumes
Phase 2

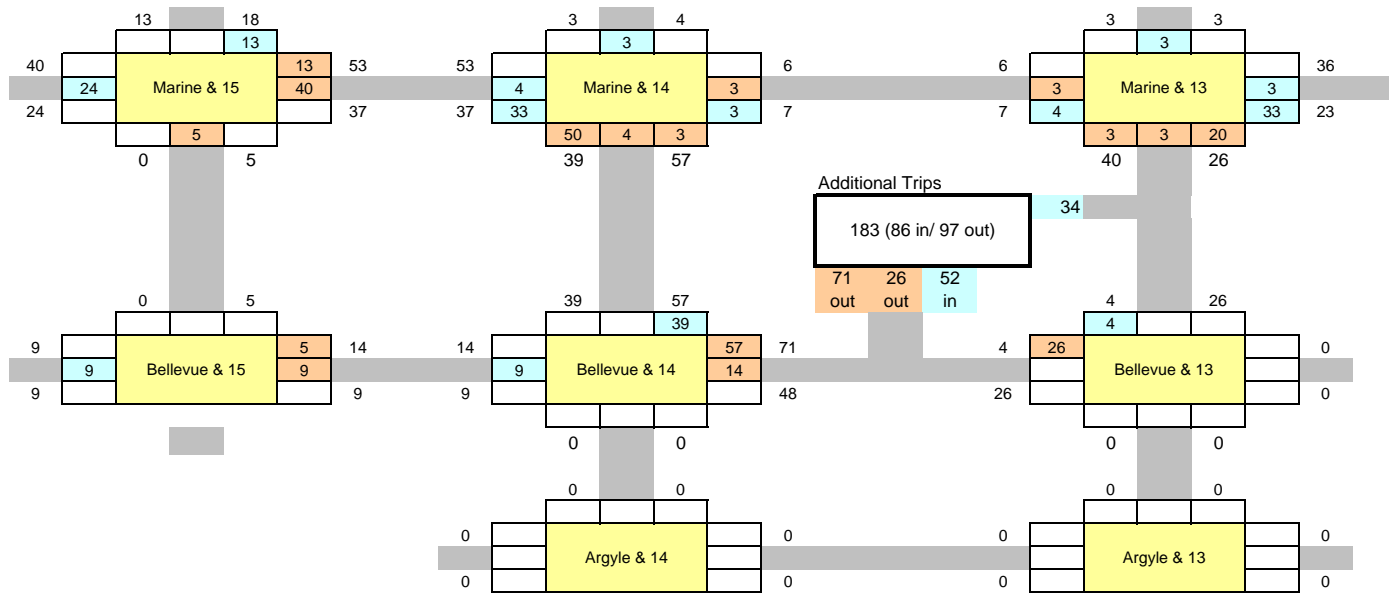
Saturday Mid-day Peak Hour: 2:30 pm 3:30 pm
4275

Appendix C: Saturday

1300 Block Redevelopment
West Vancouver
Traffic Count Data: Saturday June

Total			183
In			86
Out			97

Distributions presented in Table 9



1300 Block Marine Dr.

West Vancouver

Total 2014

Saturday Mid-day Peak Hour: 2:30 pm 3:30 pm

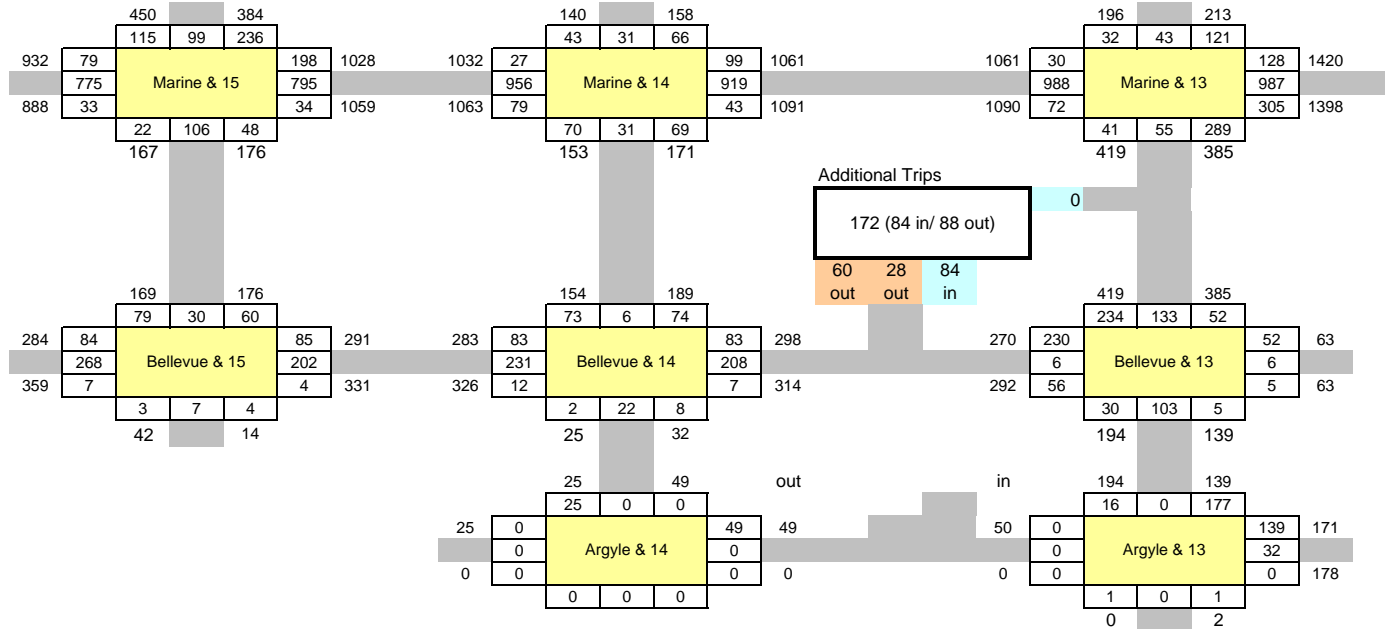
4275

1300 Block Redevelopment

West Vancouver

Traffic Count Data: Saturday June 11, 2011

Appendix C: Saturday



1300 Block Marine Dr.

West Vancouver

Total 2016

Saturday Mid-day Peak Hour: 2:30 pm 3:30 pm

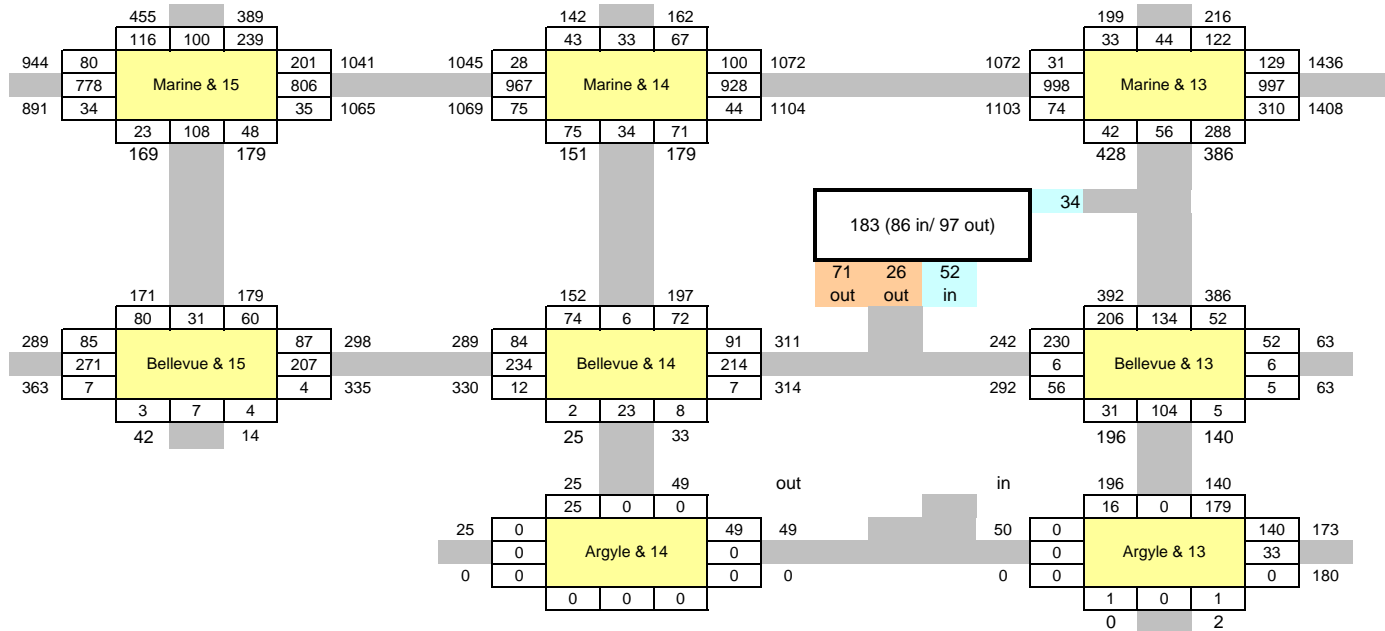
4275

1300 Block Redevelopment

West Vancouver

Traffic Count Data: Saturday June 11, 2011

Appendix C: Saturday



1300 Block Marine Dr.

West Vancouver

Total 2026

Saturday Mid-day Peak Hour: 2:30 pm 3:30 pm

4275

1300 Block Redevelopment

West Vancouver

Traffic Count Data: Saturday June 11, 2011

Appendix C: Saturday

