LAND USE REPORT (LUR)
358-376 PORTUGAL COVE ROAD

Prepared for:
City of St. John's
P. O. Box 908
St. John's, A1B 4C4

ST. JOHN'S

Proponent:
Fine Homes by Gibraltar
33 Pippy Pl Suite 103,
St. John's, NL A1B 3X2

FINE HOMES BY GIBRALTAR

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INTRODUCTION

Gibraltar Fine Homes is proposing to develop low density, infill housing at 358-376 Portugal Cove Place intended meet the needs of the residents of St. John's during a time of immense housing shortage and rising residential costs.

Gibraltar proposes to construct 14 dwelling units designed to cater to seniors in 3 townhouses facing Portugal Cove Place. On-site parking will be provided for each home. These will enhance the visual appeal of the street and the integrity neighbourhood.

Behind these residential grade units, there will be a cluster development of 11 multifamily low-rise, apartment buildings providing 154 units as shown on the overview map below.

The associated upgrade to Portugal Cove Place will address both vehicle and pedestrian accessibility and safety issues. These include a sidewalk on both sides of the road from Hunt's Lane to Aylward's Lane on the west side, and on the east side as far as the cul-de-sac bulb. This will provide a complete sidewalk connections to transit stops on Hunt's Lane and Higgins Line. The proponent is working with Metrobus to provide a dedicated stop within the area of the development.

Behind the seniors housing, Gibraltar is proposing a cluster development consisting of eight multi-family, low-rise apartment buildings ranging in size from 8 to 23 units as shown on the Concept Plan in Appendix C. Local access roads will connect on-site parking areas to two accesses to Portugal Cove Place. Parking for vehicle and bicycles will meet and exceed City standards. Sidewalks throughout the site will connect to Portugal Cove Place.

Gibraltar Fine Homes Ltd. Has made an application to the City of St. John's to rezone land at 358-376 Portugal Cove Place from the Residential (1) Zone to the Residential 2 (R2) and Apartment 1 (A1) Zone for a mixed subdivision development. The property is designated as Residential; therefore, no amendment is required to the Municipal Plan.

The Cluster Development offers a blend of attractive buildings with individual style, functionality, landscaping, and community-centric living creating a neighbourhood within a neighbourhood. The internal road, parking and sidewalk connectivity addresses the needs of both vehicular and pedestrian traffic for future residents of all ages and household incomes.

From a fiscal perspective, this proposed infill development maximizes the use of existing city services and will provide a positive contribution to the tax base for the City

In considering the amendment the City issued a Terms of Reference for a Land Use Report (LUR) (see Appendix A) to provide additional information on the proposed development and to identify any significant impacts that the development may have on land uses adjoining the subject property.

The report has been prepared to address the requirements of the Terms of Reference with input from the following firms:

- Gibraltar Fine Homes., Project Management
- HW Architecture
- Pinnacle Engineering Ltd.
- Anna Myers, Planning Consultant
- Mills and Wright, Landscape Architecture

A. Public Consultation

A flyer outlining the proposed development was prepared (Appendix B) and distributed by drop off to the households in the neighbourhood potentially affected by the development). About 75 flyers were put in mailboxes in the area shown on the map. As the weather was clear and cold for the entire week, a corner of the flyer was made visible so that the occupant of the home would see that there was a new item in the mailbox. The neighbourhood appears to consist of middle class households with mainly modest homes and a number of homes had subsidiary apartments.

Only five residents were available to discuss the proposal. In general, they commented on the fact that many of the homes in the area were occupied by renters. They speculated that the renters would be unlikely to respond to the flyer and that they may not actually pass the information on to the property owners. They were very positive about the type of housing being constructed; and appreciated the proposed upgrade of the sidewalks on Portugal Cove Place to the bus stop. Apparently people are often walking on the street and not facing traffic when doing so.

Seven responses were received. The key points are summarized as follows:

1) **Concerns About Traffic:**
   - The development proposal for nearly 160 housing units in a low-density area raises concerns about congestion and traffic bottlenecks, especially as the area is not designed to handle high-density traffic.
   - There are concerns about the capacity of local roads, such as Portugal Cove Place and the intersection at Bells Turn and Higgins Line.
   - Several individuals raised concerns about the accuracy and comprehensiveness of the proposed traffic impact assessments, particularly the intersection at Bells Turn and Higgins Line. A more thorough traffic study is suggested to evaluate the full impact of the development on the existing infrastructure.

2) **Road and Infrastructure Issues:**
   - The local roads, particularly Portugal Cove Place and the surrounding area, may not be wide enough to accommodate construction traffic.
   - Concern about safety of proposed new exit onto Portugal Cove Road,

3) **Safety Concerns:**
   - Specific safety issues include the dangerous intersection, the need for better road markings and signage (such as improving STOP sign compliance), and pedestrian safety concerns near bus stops and mailboxes.
   - Suggestions include removing parking in hazardous areas, adding speed bumps, and improving the visibility at critical intersections.

4) **Impact on Neighborhood Character:**
   - Some concern about the shift in neighborhood dynamics, such as increased rental housing and changes to the community's character. There is also skepticism about the claim of "seniors housing," given the potential for student rentals.

5) **Request for Further Consultation:**
   - There is a call for more consultation with the local community and residents to ensure that the impacts on traffic, infrastructure, and safety are adequately addressed before the development moves forward.

In summary, residents are concerned about traffic congestion, road safety, and the potential negative impact of the proposed development on the neighborhood's infrastructure and character. They are advocating for a more thorough traffic study and further consideration of safety issues before proceeding with the project.

Response to Concerns

Traffic:
While the Higgin's Line/Bell's Turn intersection is a key access to the area, it is not the only access/egress to the area. Residential traffic can also take the Hunt's Lane/Gloucester Street route in order to access Ridge Road and the Outer Ring Road.

The Traffic study was conducted by professional traffic engineers using industry standards. Their calculations for projected peak hour traffic indicated the increased traffic was not great enough to trigger more detailed traffic study according the existing City standards; nonetheless, the concerns raised in the community will be discussed with the City.

Road and Infrastructure:
Gibraltar is confident that access to the site for construction traffic can be accommodated in the existing road infrastructure. Given the type of construction and the phasing of the project, there should be minimum overall impact on the local traffic.

The proposed exit onto Portugal Cove Road is no longer part of the Concept for this proposed development; therefore, this concern has been addressed.

Safety:
Regarding safety, the proposed sidewalk enhancements on Portugal Cove Place to Higgin's Line will be a benefit to the safety of pedestrians and vehicles alike. Other safety measures, as suggested, may be implemented as the need arises.

Neighbourhood Character:
Gibraltar is committed to preserving the integrity of the residential character of this centrally located neighbourhood in the city. The housing facing Portugal Cove Place will visually blend with the housing across the street. It will be designed to appeal to seniors; however, it is acknowledged that this housing may appeal to other demographics as well. The apartment housing behind the detached units constitutes a cohesive, integrated low-rise cluster development that will have little to no visual impact on the neighbourhood.

Conclusion

Gibraltar's attention to design detail reflecting the character of the neighbourhood and market-responsive housing options, combined with the accessibility to a wide variety of transportation modes, access to established municipal services, makes this proposed housing concept a valuable asset to the City of St. John's and the neighbourhood of Portugal Cove Place.

B. Site Location and Lot Layout

1) Site Location

The property address 358-376 Portugal Cove Place as shown on the map (red polygon). The site consists of approximately 2.8 hectares in the middle of the east end of St. John's Located between Higgins Line/Newfoundland Drive to the south, Outer Ring Road to the North and Portugal Cove Road to the east, it is a very central location. The land is uncleared and overall site is generally level. There is about 126 m frontage onto Portugal Cove Place.

There are 12 adjoining residential properties consisting of single detached dwellings facing onto Portugal Cove Place (as shown on map in blue overlay). Behind the houses on the east side of Portugal Cove Place there are several accessory buildings and vacant land.

The lot layout is provided in the Concept Plan found in Appendix C.

The types of proposed housing and number of buildings is set out on the following table.

RESIDENTIAL 2 ZONE (R 2)		
• Townhouse	3 buildings	14 units
CLUSTER DEVELOPMENT IN APARTMENT 1 ZONE (A 1)		
• 23 unit-Apartment	3 buildings	69
• 14 unit-Apartment	2 buildings	28
• 12 unit-Apartment	1 building	12
• 10 unit-Apartment	**2 buildings**	20
• 9 unit-Apartment	**1 building**	9
• 8 unit-Apartment	**2 buildings**	16
		154 units
Total number of dwelling units = 168		

2) The requirements as set out in the Terms of Reference are addressed below. Details are also set out in the Concept Plan found in Appendix C.

   a. Include all zone requirements on a subdivision plan, such as lot area, frontage, building line, all setbacks and building height. These are found in Appendix C.

      The Building heights are not shown on the drawings at this time, but will be included in the submissions for at the building design stage. At this time, the building heights are provided below from front grade and rear grade:.

      - 23 unit buildings – 8.5m at front elevation, 9.8m at rear elevation
      - 10 unit buildings – 4.0m at north elevation, 6.7m at south elevation
      - 14 unit buildings – 8.5m at front elevation, 9.8m at rear elevation
      - 9 unit buildings – 7.3m at front elevation, 9.8m at rear elevation
      - 8 unit buildings – 7.3m at front elevation, 7.3m at rear elevation
      - 12 unit buildings – 8.5m at front elevation, 9.8m at rear elevation

   The Concept Plan is in conformity with the standards for development for the Residential 2 (R2) zone as follows:

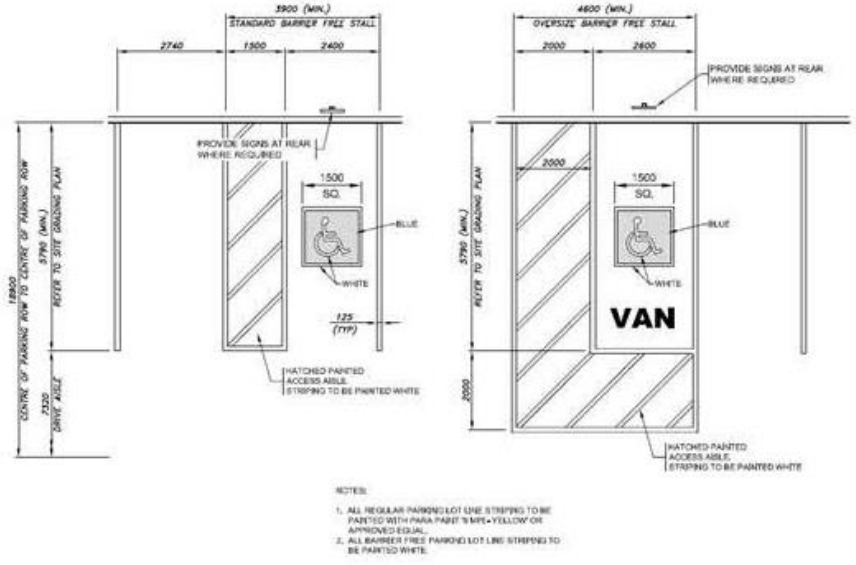
Development standard	**Townhouse**
Lot area (minimum)	180 square metres
Lot Frontage (Minimum)	6 metres
Building Line (Minimum)	6 metres
Building Height (Maximum)	10 metres
Side Yards (Minimum)	0 metres, except on a Corner Lot where the Side Yard abutting the Street shall be 6 metres and except for the end unit where the Side Yard on the unattached side shall be 1.2 metres
Rear Yard (Minimum)	6 metres

The Concept Plan is in conformity with the development standards for the Cluster Development in the Apartment 1 zone (A1) zone (DRA #37-Housing amendment) as follows:

Development standard	**Zone: Apartment 1: A1**
Lot Area -Min. m^2 per Dwelling Unit	Council Discretion
Lot Frontage -Min (m)	20
Building Line -Min (m)	6
Building Height-max (m)	14
Side Yard -Min (m) *	Two, each equal to 1 metre for every 4 metres of Building Height, except on a Corner Lot where the Side Yard abutting the Street shall be 6 metres
Rear Yard -Min (m)	6
Lot Coverage	35%
Landscaping -Min (%)*	35%

* Note that a request has been made to the City to reduce the percentage to 30%

b. Indicate driveway locations and dimensions.
   - In the proposed R 2 zone, driveways are in front of each dwelling unit; driveway dimensions are 6m x 3 m.
- In the proposed A 1 zone, parking is provided in parking lots associated with each building and meet the requirements of the City of St. John's. There is a total of 172 standard parking spots for the total of 154 units and 12 barrier-free parking spots.
- The individual stalls for standard parking are 5.79 m x 2.74 m. The barrier-free stalls are shown on the diagram below. The City of St. John's standards for the width of barrier free parking stalls is met: 94 inches for a car and 102 inches of a van.



c. Indicate front yard landscaping percentage for each lot.

   The Concept Plan is in conformity with the development standards for 35% landscaping per townhouse building in the R 2 zone. For the Cluster Development, the standard landscaping (excluding greenspace) is 0.85 hectares (30%) plus 924 m^2 of green space as shown in Appendix K and statistics in Appendix C. Note that the Developer has requested a reduction in the minimum requirement for standard landscaping from 35% to 30%.

d. Indicate the required resident green space for the Cluster Development.

   - The Concept Plan is in conformity with the development standards requiring a minimum of 6m^2 per unit with the Concept Plan showing 924 m^2 of Green Space. The location of the green space is shown on the drawing in Appendix K which illustrates how each multi-unit building is surrounded by green space. It also shows the green space between the Cluster Development and the R 2 housing as well as the green buffer between the development and Portugal Cove Roads. There is also green space between the multi-unit buildings and the dry pond.
   - The key open space area is located at the southeast entrance to the site. This provides a natural green welcoming entrance to the site and a park space that can be used by both the resident's of the apartment buildings and the residents of the existing neighbourhood. At this time there is no park in the neighbourhood and the improvements to the sidewalks plus the walkways within the site make this park accessible to everyone.

e. Provide a dimensioned parking plan, including circulation details and parking lot buffers. Identify the number and location of off-street parking spaces to be provided, including accessible parking spaces.

   The Concept Plan is in conformity with the development standards for Parking, set out below as provided in the Development Regulations:

Type of Building	Minimum spaces	Maximum spaces
Apartment	2-bedroom=1 space Visitor parking: 0 visitor parking spaces for the first 7 Dwellings; 1 visitor parking space per 7 Dwellings thereafter	2-bedroom=1.5 spaces ○ Maximums are cumulative for building and inclusive of visitor parking
Residential, except ○ Apartment Building, Dwelling Units in a Commercial or Institutional Zone, Micro Unit Dwelling and Tiny Home Dwelling	1 parking space for every Dwelling Unit	n/a

A description of the proposed development and parking is outlined in the table below.

RESIDENTIAL 2 ZONE (R 2)			
HOUSING TYPE	**BUILDINGS**	**UNITS**	**PARKING**
• Townhouse	3	14	1 per unit
CLUSTER DEVELOPMENT IN APARTMENT 1 ZONE (A 1)			
• 23 unit-Apartment	3	69	-Standard parking=172 -Barrier free=12 -Total parking spots=184 -Bicycle=74
• 14 unit-Apartment	2	28	
• 12 unit-Apartment	1	12	
• 10 unit-Apartment	2	20	
• 9 unit-Apartment	1	9	
• 8 unit-Apartment	2	16	
	11	154	
• Parking requirements: 154 for DU + 21 for visitors=175 • Bicycle requirement: 1 per 2 units=72 spots			

- The Concept Plan (Appendix C) indicates how the parking lots in the Cluster Development meet the buffer standard set out in 8.8 (1) ((b): "… have a Buffer of 6 metres from any Street Line and a Buffer of 3 metres from any other Lot Line, and where abutting a Residential Use have a privacy fence not less than 1.8 metres in height, unless otherwise approved by Council…"

- Parking lot circulation should be reasonably clear and intuitive for people accessing the residential units. Residents and visitors must be able to easily navigate the site without unnecessary circulation. It is standard practise to provide information/wayfinding signs with building numbers and directional information which would ensure that the make the site is easily accessible.

f. Note that the applicant does not wish to change the parking requirements of the Development Regulations, therefore no further information is included here.

g. Identify the number and location of bicycle parking spaces to be provided.

    - The Concept Plan is in conformity with the development standards that require one bicycle space for every two units. The location of the bicycle

parking is shown on the Concept Plan in Appendix C. They are generally at the end of each of the eight apartment buildings.

h. Identify the location of all access and egress points, including pedestrian access.

- The Concept Plan in Appendix C shows the two access/egress points to Portugal Cove Place (8.25 m);
- Barrier-free accessible walkways, 1.6 metres wide are provided from the public sidewalk of each apartment building entrance to the relevant amenities including bike parking and garbage bins (Refer to Appendices D and K).
- These walkways around the buildings connect with the sidewalk system to Portugal Cove Place. They are outside the area of door swings, curb ramps, and vehicle loading areas.
- The developer also proposes to extend the sidewalks on Portugal Cove Place so that pedestrians will have sidewalks on both sides of the road all the way from Higgin's Line to the cul-de-sac at the top access/egress point into the Cluster development.
- Vehicle turning movements for garbage truck and firetrucks are shown on the drawing in Appendix. D. This drawing demonstrates access to garbage bins and the feasibility of site circulation. The private contractor will load the garbage by hand into trailers

i. The future easements will be shown on the engineering drawings when the concept plan is finalized. are no existing or proposed easements on the site.

3) Provide a Legal Survey of all properties:

- The legal survey of the overall property can be found in Appendix E. The legal survey for the attached dwellings facing Portugal Cove Place will be provided when the subdivision plan is approved. At this stage, the lots are outlined in the Concept Plan. A new survey will be completed at the detail design phase after re-zoning.

C. Municipal Services

1) The Preliminary site servicing plan in provided in Appendix F. While It is indicated that an enclosure will be constructed to accommodate the premise isolation equipment for this site, the developer will consult with the City to review the various options for this site prior to finalizing the detailed site servicing plans. It is recognized that the complexity of this site will require multiple devices and associated equipment which may make this enclosure fairly large and hence expensive; therefore, it there are more economical options that can be used to satisfy the premises isolation requirements for this site that meet the requirements of the City, these options will be pursued.

2) Points of connection to existing and proposed sanitary sewer, storm sewer and water system; location of all existing sewers with any existing or proposed easements are shown the preliminary site servicing plan in Appendix F

    a. The R 2 housing will connect directly to services proposed for Portugal Cove Place. The storm water for this housing will be managed as per the DDM and will meet the predevelopment flow rate. The residential townhouses fronting on Portugal Cove Place can direct stormwater to the street, as long as they are adhering to the DDM and stormwater detention requirements.

    b. The A 1 Cluster Development will be serviced by a water connection to the existing 400mm water main located in Portugal Cove Place. Sanitary services will be connected to services located at Portugal Cove Place. Storm water services for the A 1 cluster will be collected and stored in the on-site stormwater detention dry pond, and led to the existing storm sewer at Portugal Cove Road. The proposed storm water flow equals the pre-development flow of 0.124 m per second.

    c. Two new private hydrants will be provided on site in the central location in the Cluster development, in accordance to municipal requirements.

    d. Sanitary sewer service for the site will be provided by connection to the existing 200 mm in Portugal Cove Place at the southeast entrance to the site. The proposed sanitary sewer generation rate from the proposed development is 8.01 L/s. Prior to final development approval, an analysis will be provided of the

existing sanitary sewer system to demonstrate the existing municipal sanitary sewer system can accommodate the flow.

e. The existing water transmission main from Windsor Lake which supplies 45-50% of the water to the City of St. John's crosses this proposed site. As required by the city, the concept plans provide for a 12-meter-wide easement centered over the existing pipe.

3) Compliance with the City's Stormwater Detention Policy: location of the proposed stormwater detention facility;

a. The stormwater detention dry pond storage volume is 3,492 m^3.
b. The land area required for this pond is 0.360 hectares located on the southeast side of the Cluster development.
c. The stormwater detention facility will be constructed according to the City's Stormwater Detention policy. In Phase 1, there will be underground stormwater storage in the area identified for Green Space on the Concept Plan;
d. Access to the stormwater detention dry pond will be off the existing City of St. John's metering house access which is located off-site between the proposed pond location and Portugal Cove Road off the northeast corner of the site. The access roads will cross the water transmission main with a finished elevation that is not reduced by more than 300 mm or increased by more than 1000 mm. The pond will be privately owned.
e. Any excavated work associated with this development/stormwater detention pond is proposed a minimum of 6 meters from the existing water transmission main.
f. An emergency spillway outlet structure will be installed. Details of structure will be provided during the detailed design phase once accurate flows/elevations have been determined, and emphasis will be provided to ensure the existing water transmission main is not compromised.
g. Stormwater detention will maintain the 100-year pre-development flows.

4) Storm and sanitary drainage area plans along with proposed generation rates for each.
a. In Appendix G, the Sanitary Drainage Area Plan (23034-F014 Rev. 1) shows the proposed flow from development along with the preliminary site servicing plan.
b. Appendix H shows the Pre-Development Stormwater Drainage Area Plan (23034-F001)

c. Appendix I shows the Post-Development Stormwater Drainage Area Plan (23034-F002) Proposed flows are from development are provided on plan along with the preliminary site servicing plan.
d. .A post development storm generation rate of 0.089cms (for the underground stormwater detention facility) is expected from the proposed R2 site development, but it is noted that this is only for a portion of the site and will have to be confirmed at the development phase. A predevelopment storm rate of 0.124cms is also included in the design drawings for the proposed dry pond and this will be confirmed at the development phase. The sanitary calculations are based on a population density of 140 people per hectare. (Refer to Appendix J)
e. Storm sewer infrastructure system complete with new catch basins and manholes will be installed to service the subject property. The post-development storm generation rate of 0.089m^3/s is expected from the proposed R2 site development.
f. The outlet from the storm water detention pond crosses the water transmission main. There will be a minimum of 450 mm of vertical separation between the two pipes as required by the city. To be determined in the Development Stage once accurate flows/elevations have been determined

5) Sanitary calculations
    a. Sanitary calculations follow Development Design Manual guidelines and the calculation are provided in an Excel spreadsheet with formula in Appendix J.
    b. Sanitary calculations were based on a population density of 140 people/ha.

D. Landscaping, Buffering & Snow Clearing/Snow Storage

a. A landscaping plan with details of site landscaping (hard and soft) in found in Appendix K that illustrates:
    a. placement of trees or other plant material (species to be determined);
    b. areas of hard and soft landscaping;
    c. total landscaped area: 865 m^2 standard landscaping, excluding green space (which translates to 30.4%);
    d. green space area of 924 m^2 -this does not include infill lot front yard landscaping;
    e. snow storage;
    f. buffering and screening (dimensions on Concept Plan in Appendix C and Appendix K).

b. Tree plan/inventory indicating which trees will be preserved.

a. The proponent wished to maintain perimeter trees that are not in the scope of the developed areas. For onsite trees, it is premature to confirm which trees will be preserved; however, once the concept plan is confirmed, a tree inventory can be prepared.

b. New tree plantings are shown in Appendix K In the proposed R 2 zone; each unit will have a tree planted in the front yard. In the proposed Cluster zone, trees will be planted along the road at the southeast entrance as a buffer and along the south east boundary between the open space and adjacent residence. Trees will be planted on the northwest side of the detention pond. Tree plantings are proposed throughout the cluster development between the multi-unit apartments and parking lots.

c. Location and proposed methods of screening of any electrical transformers and refuse containers to be used at the site.

   There are four electrical transformers anticipated within the Cluster Development. It is premature to indicate screening at this time as locations have not been finalized.

d. Information on any snow clearing/snow removal operations.

   Areas designated for snow storage are show in Appendix K. These are located in the Green Space at the southeast entrance to the site, in the 6-metre buffer on the outside of the site between the parking lots and outer perimeter bordering Portugal Cove Road, and in located away from entrances at the back of the multi-unit apartment buildings in the centre of the Cluster development. These locations ensure that the snow storage does not affect onsite vehicle or pedestrian circulation on roads, sidewalks and walkways. Snow clearing and removal will be the responsibility of the private owner of the site.

E. Transportation System

1) Traffic Assessment: Applicant to provide a traffic impact assessment summarizing the anticipated peak hour and daily trips generated by the proposed development. Depending on the results of the assessment, capacity analysis of nearby intersections, including Bell's Turn at Higgins Line, may be required.

a. Harbourside Transportation Consultants completed a Transportation Impact report relating to the development application for a proposed residential development at 358 Portugal Cove Place in St. John's, NL. The report can be found in Appendix L .The following conclusions are noted from the investigations carried out:
    i. **Site-Generated Traffic**: The proposed development is expected to generate 70 new vehicle trips in the AM peak hour (17 trips entering, 53 trips exiting) and 87 vehicle trips in the PM peak hour (54 trips entering, 33 trips exiting). This analysis considers that all of the site generated traffic will be routed through the intersection of Higgins Line and Bell's Turn, a conservative approach as there is an alternate route available via Portugal Cove Place - Hunt's Lane – Gloucester Street – Ridge Road.

    ii. **Emergency Access Sight Distance:** The proposed emergency access on Portugal Cove Road will meet minimum stopping and turning sight distance requirements for both Portugal Cove Road and the TCH eastbound off ramp.

    iii. **Existing Operations:** The intersection of Higgins Line and Bell's Turn is stop-controlled and has separate left and right turn lanes for vehicles exiting Bell's Turn as well as a median left turn lane for vehicles turning left from Higgins Line. There are no existing operational deficiencies/concerns at the intersection of Higgins Line and Bell's Turn.

    iv. **5-year Background Operations:** The addition of background traffic growth is not expected to cause any significant operational deficiencies/concerns at the intersection.

    v. **5-year Total Operations:** The addition of site-generated traffic will result in the eastbound left turn (Bell's Turn) operating at LOS E during the AM and PM peak hours. Volumes for this movement are expected to remain below capacity.

    vi. **Signal Warrant:** Traffic signals are not warranted at the intersection of Higgins Line and Bell's Turn based on existing and future traffic volumes.

2) Recommendations

The new vehicle trips associated with the proposed residential development can be accommodated at the intersection of Higgins Line and Bell's Turn with a minor impact on traffic operations – overall delay per vehicle on the stop-controlled approach (Bell's Turn) is expected to increase by 13.8 seconds in the AM peak hour and 5.9 seconds in the PM peak hour when compared to the exiting conditions. The left turn movement from Bell's Turn is expected to experience the longest increase in delay during the AM peak hour, increasing from 29.7 s (LOS D) to 48.9 s (LOS E), however the v/c ratio for this movement will remain below capacity (v/c = 0.69). No improvements are proposed at the intersection of Higgins Line and Bell's Turn. As noted herein, to remain conservative the analysis considers that all the site generated traffic will be routed through the intersection of Higgins Line and Bell's Turn. An alternate route is available for drivers between the proposed development on Portugal Cove Place and Higgins Line via Hunt's Lane – Gloucester Street – Ridge Road. There is an existing traffic signal at the intersection of Higgins Line and Ridge Road. This is an available alternative for drivers that may be uncomfortable turning left at Bell's Turn.

3) Provide confirmation from the province that the proposed access to the Outer Ring Road ramp is acceptable. Legal agreements will be required. The form of the agreements will depend on details of the provincial approval.

   The City has indicated that details of the emergency access can be addressed at the detailed design stage based on the design submitted to the provincial Department of Transportation and Infrastructure which resulted in their acceptance of an emergency access to the rear of the existing parking lot. This emergency access design will be subject to the following conditions:

   a. The developer has an agreement with the City over the use/maintenance of the parking area. (Developer should note that the City does not currently plow this parking area, but the emergency access must be accessible at all times – snow clearing into the lot would be a developer responsibility).
   b. The developer works with the City during the detailed design process to ensure that there is no conflict with existing infrastructure. (The City believes this should be achievable as much of the equipment in this area is abandoned).

4) Portugal Cove Place Improvements:

   a. Appendix N includes a separate plan that shows the general layout and horizontal alignment of required upgrades to Portugal Cove Place. The

adjacent property boundaries are shown so that any impacts to private property can be clearly identified. The plans include a proposed cross section for the required upgrades. This cross section complies with minimum requirements of the City's DDM and includes the right-of-way buffer behind the sidewalk on Portugal Cove Place.

b. Access Sight Distance: Sight lines at the southern site access on Portugal Cove Place are anticipated to be adequate. The northern site access is located off the proposed cul-de-sac bulb. Sight lines will only be required in one direction - south of the northern access (looking to the left). Without vehicles parked in the adjacent town house driveways, stopping sight distance is available. With parked vehicles the sight distance is reduced to approximately 45 metres. While the intersection sight distance will not meet the requirements for a speed of 50 km/h, speeds approaching the cul-de-sac can reasonably be assumed to be lower, and the volume of conflicting vehicles (i.e. vehicles continuing past the driveway to go around the cul-de-sac bulb) is anticipated to be very low. Given the location of this driveway, the speed reduction necessary for vehicles approaching the cul-de-sac bulb, and the anticipated very low volume of vehicles that would conflict with vehicles exiting the driveway, this is not a significant concern. A concealed intersection sign (WA-13R) could be considered but is not deemed necessary. General TAC guidance indicates that "concealed or unexpected intersection signs should not be used to warn of private driveways on entrances".

c. Pedestrian Access**:** Portugal Cove Place will have adequate pedestrian connections with the newly constructed sidewalks in front of the proposed development.

5) Cluster development:
   a. Parking: The site's proposed vehicle and bicycle parking supply will meet or exceed the City's minimum parking requirements.
   b. Site circulation (i.e. pavement markings) are illustrated in Appendix C (stop back signs) and Appendix D (passenger vehicle turning).
   c. The developer acknowledges that the City encourages incorporation of Electric Vehicle Charging Stations. The developer will follow the City lead with regard to policy on EV readiness and will address in greater detail in Detailed Design stage in order for the parking lots to be EV ready.

F. Public Transit

1) Consult with St. John's Metrobus (St. John's Transportation Commission) regarding public transit infrastructure requirements and include their response and any recommendations in the report.

   a. Metrobus noted that the closest bus stop is located at #4 Hunts Lane. The distance from the proposed property and the closest bus stop is less than 200 meters which is well within the Metrobus set standards of service. Metrobus indicated that the ridership on the bus stop located at 4 Hunts Lane averages 9.6 boarding per weekday. Metrobus has indicated that the development will have an effect on the existing stop, but not enough to warrant a shelter. In conclusion, Metrobus indicated that it will not require the developer to help with transit infrastructure upgrades at this location.

2) In addition, residents in the area can avail of other Metrobus routes nearby:
   a. Bell's Turn and Hunt's Lane are serviced by three Metrobus routes:
      i. Route 9 – MUN | Torbay Road | Logy Bay Road
      ii. Route 14 – Airport | Torbay Road | MUN
      iii. Route 23 – Avalon | MUN | Stavanger

   b. Two additional routes can be accessed on Higgins Line:
      i. Route 1 – Village | Institutes
      ii. Route 13 – Village | Institutes EXPRESS
      iii. The nearest stop on Higgins Line is located at the former Super 8 Hotel (Bus Stop ID: 1175) approximately 500 metres (7-minute walk) from the edge of the site.

G. Construction Timeframe

1) The site plan indicating the phasing of the project is provided in Appendix M.

2) Phasing of the project and approximate timelines for beginning and completion of each phase or overall project. At this time, the dates for each phase are as follows:
   i. Phase 1: Fall 2025 to Fall 2026;
   ii. Phase 2: Spring 2026 to Fall 2027;
   iii. Phase 3: Fall 2027 to Winter 2028.

3) Site plan showing any designated areas for equipment and materials during the construction period**.**

a. Equipment and materials will be located on the undeveloped areas of the site as construction progresses. As these are located within the Cluster Development area, they will not be visible from Portugal Cove Place and existing home owners.

CONCLUSION

- The City of St. John's is experiencing a housing shortage. Housing costs are rising, rental vacancy is low and there is a lack of new housing according to the City of St. John's Housing needs assessment. The proposed development would bring construct 14 dwelling units designed to cater to seniors in three townhouses facing Portugal Cove Place and 154 new apartment units in the cluster development for a total of 168 units into the market in a very central location within the city.

- The project is close to services and transportation to jobs, education faculties and other amenities the city has to offer.

- The quality design by Gibraltar Fine homes is intended to offer a quality living environment that will appeal to a wide demographic. Such as young professionals, families or seniors or retirees seeking housing to down size, yet stay in the city. The structures will be low rise in nature and wood frame; these are generally quicker to construct and accelerate getting the housing to market as compared to commercial construction.

- The project will enhance the visual amenity of the neighbourhood with the addition of new street trees and sidewalks to provide safe walking for existing and future residents.

- The project will meet or exceed City requirements for standard and accessible vehicle parking and bicycle parking.

- The orientation of the site allows for the development to have minimal impact on the visual neighbourhood character as low-rise multi-unit face Portugal Cove Place.

- The proposed sidewalk enhancements to Portugal Cove Place will make the street safer for pedestrians, particularly those accessing the local bus stop and/or other bus stops nearby. (see proposed street upgrade in Appendix N)

- The key concern is related to the Bell's turn intersection at peak hours. However, the projected increase is less than the threshold for additional measure to be put in place. This may be the subject of additional discussions with the City.

Gibraltar Fine Homes is committed to working with the City of St. John's to make this exciting project a reality that enhances the community and meet the city's goals to provide housing for all.

APPENDIX A -TERMS OF REFERENCE

TERMS OF REFERENCE
LAND USE REPORT (LUR)
APPLICATION FOR SEMI-DETACHED DWELLINGS, TOWNHOUSES AND CLUSTER DEVELOPMENT AT
358-376 PORTUGAL COVE ROAD
AUGUST 12, 2024

The proponent shall identify significant impacts and, where appropriate, also identify measures to mitigate impacts on land uses adjoining the subject property. All information is to be submitted under one report in a form that can be reproduced for public information and review. The numbering and ordering scheme used in the report shall correspond with that used in this Terms of Reference and a copy of the Terms of Reference shall be included as part of the report (include an electronic PDF version with a maximum file size of 15MB). A list of those persons/agencies who prepared the Land Use Report shall be provided as part of the report. The following items shall be addressed by the proponent at its expense:

A. Public Consultation

a. Prior to submitting a first draft of the Land Use Report to the City for review, the applicant must consult with neighbouring property owners. The Land Use Report must include a section which discusses feedback and/or concerns from the neighbourhood and how the proposal addresses the concerns.
b. Should the site plan change following this consultation, additional neighbourhood consultation may be required.

B. Site Location and Lot Layout

1) Identify the location of the proposed development in relation to adjoining properties and identify the use of each lot (i.e. dwelling type).

2) Include all zone requirements on a subdivision plan:
   a. Include all zone requirements on a subdivision plan, such as lot area, frontage, building line, all setbacks and building height.
   b. Indicate driveway locations and dimensions.
   c. Indicate front yard landscaping percentage for each lot.
   d. Indicate the required resident green space for the Cluster Development.
   e. Provide a dimensioned parking plan, including circulation details and parking lot buffers. Identify the number and location of off-street parking spaces to be provided, including accessible parking spaces.

f. Where an applicant wishes to provide a different number of parking spaces then required in the Development Regulations, a Parking Report is required, which at a minimum must address:
    i. parking generation rates for the Development including pre- and post-development;
    ii. parking duration (short/long term);
    iii. available parking in the area (private/public on-street, parking lots and garages);
    iv. effects on traffic and local parking;
    v. traffic to and from the Development; neighbourhood impact;
    vi. other available transit options.
g. If parking relief is being requested, then a detailed rationale, as acceptable by staff, must be included. Additional information may be requested upon review of the parking proposal.
h. Identify the number and location of bicycle parking spaces to be provided.
i. Identify the location of all access and egress points, including pedestrian access.
j. Identify any existing or proposed easements.

3) Provide a Legal Survey of all properties.

C. Municipal Services

a. Provide a preliminary site servicing plan.
b. Identify points of connection to existing sanitary sewer, storm sewer and water system. The location of all existing sewers must be shown along with any existing or proposed easements.
c. The proposed development will be required to comply with the City's Stormwater Detention Policy. Stormwater detention is required for this development. Indicate the location of the proposed stormwater detention facility.
d. Provide the storm and sanitary drainage area plans along with proposed generation rates for each.
    i. Sanitary calculations to follow the Development Design Manual guidelines and all calculations must be provided in an Excel spreadsheet with formula.
    ii. Include additional information regarding population density that supports the type of development being proposed.

D. Landscaping, Buffering & Snow Clearing/Snow Storage

a. Identify with a landscaping plan, details of site landscaping (hard and soft) that illustrates:
    i. Proposed placement of trees or other plant material;
    ii. Show areas of hard and soft landscaping;
    iii. A calculation of the total landscaped area;
    iv. Proposed snow storage;
    v. Buffering and screening.

b. Indicate through a tree plan/inventory which trees will be preserved.
c. Identify the location and proposed methods of screening of any electrical transformers and refuse containers to be used at the site.
d. Provide information on any snow clearing/snow removal operations.

E. Transportation System

a. Applicant to provide a traffic impact assessment summarizing the anticipated peak hour and daily trips generated by the proposed development. Depending on the results of the assessment, capacity analysis of nearby intersections, including Bell's Turn at Higgins Line, may be required.
b. Provide confirmation from the Province that the proposed access to the Outer Ring Road ramp is acceptable. Legal agreements will be required. The form of the agreements will depend on details of the provincial approval.

F. Public Transit

Consult with St. John's Metrobus (St. John's Transportation Commission) regarding public transit infrastructure requirements and include their response and any recommendations in the report.

G. Construction Timeframe

a. Indicate any phasing of the project and approximate timelines for beginning and completion of each phase or overall project.
b. Indicate on a site plan any designated areas for equipment and materials during the construction period.

APPENDIX B – COMMENTS FROM PUBLIC & FLYER

From: [redacted]>
Sent: February 21, 2025 2:42 PM
To: [redacted]>
Subject: feedback on the Portugal Cove Place residential development proposal

Hello,

This e-mail is in response to your request for comments and feedback on the Portugal Cove Place Residential Development Proposal we received earlier this week.

1. The proposal calls for close to 160 units (the proposal is not specific enough to be precise) to be built on a relatively small piece of land, which will create high unit density island in a low unit density area. This might create congestion and bottlenecks the area is not designed to handle.

2. The Portugal Cove Place road between Hunts Lane and Aylwards Lane will no doubt be used by the heavy equipment required to built the proposed 160 units for possibly 2-3 years. However, the road might not be prepared to handle the additional heavy traffic: the road may not be wide enough (even narrower after upgrading to having sidewalks on both sides, too narrow to allow safe pass of heavy trucks). Besides, the heavy traffic along that road will negatively impact the residents of Gilmore Street and Aylward Lane, and may occasionally cut them off from accessing their homes. There is no alternative to Portugal Cove Place to access these two streets.

3. The bottlenecks on the Hunts Lane and Portugal Cove Place intersection and Bell's Turn and Higgins Line intersection might be much heavier than estimated by the proposal in particular during the 2-3 year construction time. The current proposal does not account for the traffic generated by the construction of the proposed 160 units. Neither does it consider an impact of the construction on the residents of Gilmore Street and Aylwards Lane, which may be quite adverse.

4. As far as it can be seen from the sketch provided, the proposal calls for an exit directly to Portugal Cove Road, and close the TransCanada Highway exit that feeds the Portugal Cove Road. This does not seem to meet the safety standards due the heavy traffic along that part of Portugal Cove Road

Best regards,

[redacted]

[redacted]

[redacted]

-Original Message-----
From: [redacted]>
Sent: February 21, 2025 10:48 AM
To: [redacted]>
[redacted]
Subject: Portugal Cove Road Place Development.

Good morning, [redacted].

I am writing as a [redacted] home owner on Gilmore Street, off Portugal Cove Road Place in response to your residential Development Proposal at the end of my street. I would describe Gilmore as a quiet street with a high concentration of residents with some affiliation to the Marine Institute or the University. The majority of homes on the street are 2 unit apartments with very few single family, owner occupied homes in the mix.

We have always commented on the number of cars that are constantly parked in front of the houses along the street. As an example, I can point out 3 houses [redacted] that are two apartment units that normally have 13 cars parked in front of them each and every night. This leads me to the point of my letter this morning. I think it is crucial that a true Transportation Impact Assessment be conducted at the Higgins Line, Bells Turn Intersection before any approvals are given for this development. As a resident who experiences that intersection many times a day, I can attest to the increased volume of traffic we see every day. Taking a left turn from Bells Turn onto Higgins line is taking your life in your hands. There are many factors that make that turn treacherous including the speed of the vehicles exiting Portugal Cove Road onto Higgins Line, vehicles making a left turn out of the Ultramar and other vehicles exiting the Tim Hortons just beyond that. We feel that the addition of traffic from your proposed development will only exacerbate the situation and someone could be hurt or killed.

Your flyer states your intention to construct “Seniors Housing” at the site. I am curious to know how you could limit your residents to this demographic with so many students actively looking for accommodation in the area all the time. I fear it will attract high volume of renters who do not display pride in ownership as owner occupied homes do.

Councillor Bruce, I ask that you take an active role ensuring thorough due diligence is completed before any permits are let and shovel’s put in the ground. This includes a complete traffic study of all four corners of this development to ensure the additional volume of traffic can be safely absorbed with the existing infrastructure.

Yours truly

[redacted]

[redacted]

From: [redacted]
Sent: February 20, 2025 10:15 AM
To: [redacted]>
Subject: Questions for Portugal Cove Place development

Good morning [redacted]

I am the process of preparing an email in response to the flyer you put in my mailbox this week. I have two questions that need clarification:

1. Regarding the Bells Turn/Higgins Line intersection; what time frame did you use for the count? Was it 15 minutes? 30 minutes? 60 minutes? How many days did you use? Which days?
   The count is strictly for vehicles entering and exiting the proposed development. The counts are generated based on the housing type and use of The Institute of Transportation Engineers Trip Generation Manual. The time-frame would be 60 minutes during the busiest AM hour and PM hour during weekdays.
2. Regarding the exit onto Portugal Cove Road (main road); is that a barricaded entrance for emergency? Or is that an exit for the residents?
   This is an emergency access only. This will be closed off from public use and only operable by Emergency Personnel.

Thank you for taking the time to make these clarifications for me.

Kind regards,

[redacted]

---Original Message-----
From: [redacted]
Sent: February 17, 2025 3:50 PM
To[redacted]>
Subject: Portugal Cove Place

Good afternoon,
I received a pamphlet in my mailbox about the proposed development. It says the deadline has been extended to February 21, but this is the first I have heard of it and the first time any information was delivered to me about it.
I do have concerns and will definitely be bringing them to the City when public consultations are held.
My concerns are with the potential enormous influx of people into the area. Rush hour traffic exiting Bell's Turn onto Higgins Line will become a potential nightmare. If I am reading your info correctly, the 8 low-rise apartment buildings that could contain up to 23 units could bring 184 families plus the seniors to the area. How could that number of new residents keep threshold to 100 vehicle trips if we are currently at 64 in the morning and 82 in the afternoon? Even if the units are at the smallest number you indicate of 8, that would still bring 64 additional families plus the seniors to the area.
I anxiously await further information and the opportunity to voice my concerns.
[redacted]

Sent from my iPhone

From[redacted]>
Sent: February 9, 2025 5:28 PM
To: [redacted]>
Subject: Portugal Cove Place

Hi [redacted],

I've read with interest your ideas for development here. It all sounds good however, I wonder if you would call me to discuss a couple of thoughts I have - and a question also. My name is [redacted] and phone #: [redacted].

Cheers,

[redacted]

From: [redacted]>
Sent: February 9, 2025 10:36 AM
To: [redacted]>
[redacted]>
Subject: 345 Portugal Cove Place proposal

Hello,

Thank you for providing an updated email address. I tried the email provided earlier - and also left a text message as per the telephone instruction - the email bounced back, and I did not receive a reply to my text.

As a [redacted] resident of Portugal Cove Place I do have serious concerns. My main area of concern is access to and from Bells Turn.

It has been my experience that Bells Turn is a dangerous road on the best of days. During snow days it is frequently blocked by people trying to turn the bend on a slippery slope, often stuck. lol Although you have estimated the number of vehicle trips on Bells Turn, it does not incorporate potential traffic flow once the proposed development is completed.

Bells Turn appears to be mostly two apartment homes with a lot of small children in the area. Exiting Bells Turn during the rush hour when turning left is also chaotic as much of the traffic from confederation building lines Higgins Line. These are issues that are currently there, without the amount of potential additional traffic from the proposal.

You state that the traffic you have indicated is below the threshold triggering a traffic assessment by the City, which is 100 vehicles. A full assessment is vital considering the proposed traffic, the nature of the narrow winding Turn, the number of children in the area, being on a Metrobus route with stops of the Turn, and the lack of parking for residents who may require a vehicle be parked on the side of the road for even short periods. The dangers of the Turn will be exacerbated.

These are my initial thoughts. Thank you for your time and consideration.

[redacted]

From: [redacted]>
Sent: February 21, 2025 2:26 PM
To[redacted]
Subject: Proposed Portugal Cove Place development

Good day [redacted],

I am in writing in regard to the proposed housing development on Portugal Cove Place.

While I am not averse to the development in principle, I do have concerns regarding its impact and suggestions for consideration.

1. The housing units proposed is 178 units, which includes 6 apartment buildings. This is a significant change from the makeup of this residential neighbourhood.

2. The traffic generated, as suggested by the flyer you have provided, seems to be very conservative. In 178 units you can expect somewhere between 178 and 250 additional vehicles. The majority of these will be using the Bells Turn/Higgins Line intersection which will significantly impact the area. In consideration for the traffic change I spent two, one-hour periods counting vehicles at this intersection, in the high traffic time of 8:30 - 9:30 am, on a weekday. The count was approximately 300 and 260 movements. This development would greatly increase the number of movements through this intersection.

The Bells Turn/Higgins Line intersection is high traffic with a majority of cars turning left towards Portugal Cove Road. These cars have to cross four lanes and a turning lane. This is a high-risk intersection. If this development is to go forward there are several suggestions that I believe need to be considered, especially regarding traffic safety.

1. The pole at the intersection of Bells Turn/ Higgins Line is an obstacle to safety. It creates a blind spot for vehicles turning left on Higgins Line. Vehicles travelling from Portugal Cove Road are on a bend in the road and the pole makes it difficult to always see approaching cars. This pole should be moved to create better visual safety.

2. Parking on the south side of Bells Turn is a danger. At present there is parking on the south side of the road all the way throughout the "S Turn" double bend in the road. Cars travelling north verve into oncoming traffic, which is blind because of the double bend in the road. Vehicles travelling at 50 KM/Hour, in both directions, and using a very narrow roadway on an S Turn is dangerous. By eliminating the parking on the south side of the road vehicular traffic safety will be greatly enhanced.

3. Placing speed bumps in two places will have positive impact on speed control and safety. If a speed bump was installed at half-way point of the double turn, on Bells Turn, traffic management would be enhanced. As well, cars often travel very fast once they have pass Hunt's Lane. By installing and speed bump between Hunt's Lane and Gilmore Street, traffic management safety will be enhanced.

4. The STOP signs at both Hunt's Lane and Gilmore street are not strictly adhered to. This poses a danger. With increased traffic this will be problematic. The need to increase STOP sign compliance through road construction updates, would enhance safety for vehicles and pedestrians.

5. Bus Stops and mailboxes. There are two bus stops at the corner of Bells Turn/Higgins Line, within a very short distance. The Bus Stop going north on Bells Turn is a risk to traffic as the cars verve into the oncoming to go around stopped buses. This combined with having the residential mailboxes at the same location causes congestion and safety issues as car pull around the traffic. This is problematic of pedestrians as well.

There needs to be more consideration go into the implications for the neighbour and traffic, vehicle and pedestrian. I strongly recommend a traffic assessment for the whole neighbourhood not just the entrances for the new development and more consultation with the residents.

Kind regards,

[redacted]

From [redacted]
Sent: February 24, 2025 3:24 PM
To: [redacted]>
Subject: Re: Portugal Cove Place

[redacted]

Thanks for answering my questions.... it seems it's all good and fair. I'm interested in the location and can't wait to go and have a look.

The reason I asked about your demolishing the duplex on Old Topsail Road was this! Many yeas ago I thought it was Gibraltar Homes who bought this terrible falling-apart old house on Old Topsail Road. When it was being demolished, we and the neighbours stood around and watched and cheered! It was sooo good to get rid of this eye-sore. The fellow from Gibraltar turned to the cheering neighbours and said..."I've just increased the value of your homes right up to the top of the market!" And he had and it was a great day:) So that's the reason for the question!!:)

Anyhow - again thank you for answers and I look forward to new homes going up over the summer, I expect.

Cheers,

[redacted]

PORTUGAL COVE PLACE

RESIDENTIAL DEVELOPMENT PROPOSAL

FINE HOMES BY GIBRALTAR

WHY WE ARE CONTACTING YOU

Gibraltar is proposing to develop the land at 358 and 376 Portugal Cove Place for residential development. The type of housing will consist of single-family attached housing and multifamily low-rise buildings intended meet the needs of the residents of St. John's during a time of housing shortage and rising residential costs.

PROPOSED HOUSING DEVELOPMENT

Gibraltar proposes to construct senior's housing facing Portugal Cove Place consisting of six semi-detached buildings (shown to the right) and one triplex townhome. On-site parking will be provided for each home.

Behind the seniors housing, Gibraltar is proposing a cluster development consisting of eight multi-family, low-rise apartment buildings ranging in size from 8 to 23 units (see pictures below). Local access roads will connect on-site parking areas to two accesses to Portugal Cove Place.

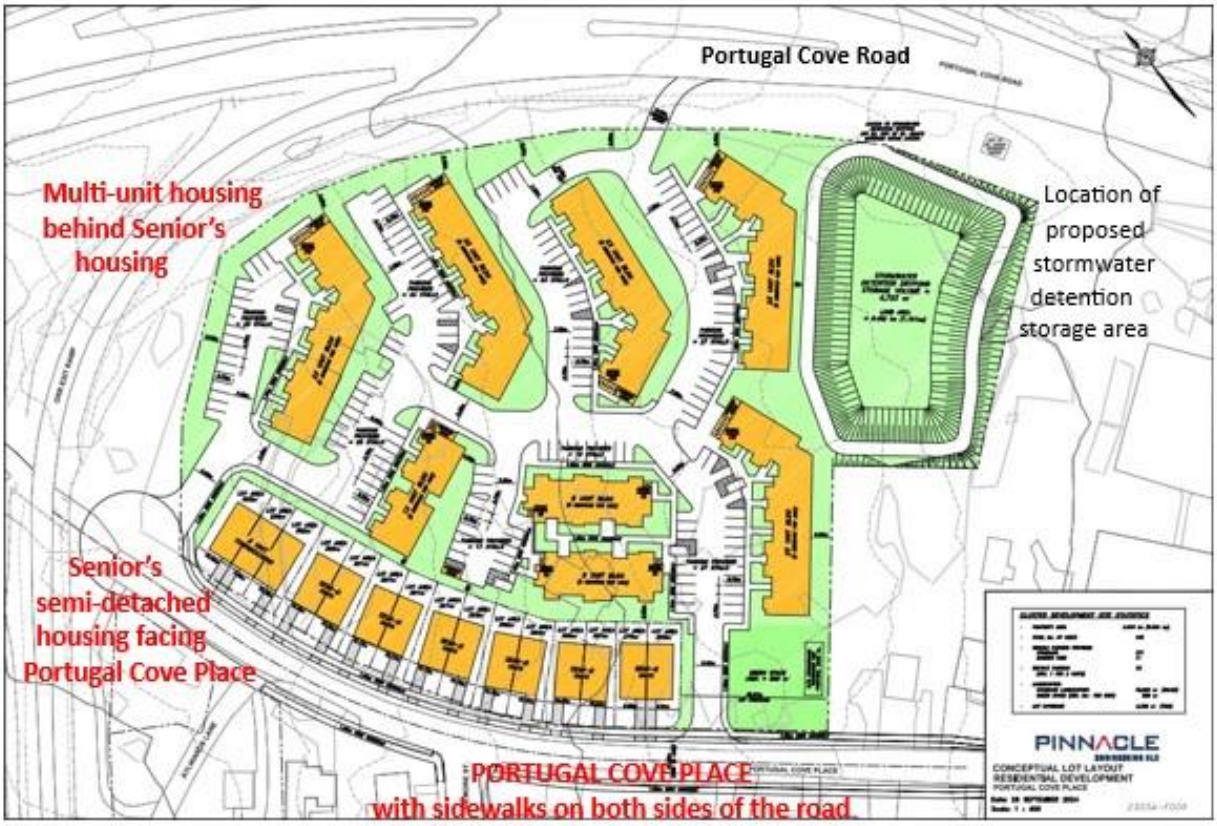
Parking for vehicle and bicycles will meet and exceed City standards. Sidewalks throughout the site will connect to Portugal Cove Place.

UPGRADES TO PORTUGAL COVE PLACE

Upgrades to Portugal Cove Place are proposed, including a sidewalk on both sides of the road from Hunt's Lane to Aylward's Lane on the west side, and on the east side as far as the cul-de-sac bulb. This will provide a complete sidewalk connections to transit stops on Hunt's Lane and Higgins Line.

DESCRIPTION OF THE SITE

The map below shows the location of the site and the general layout of the proposed residential structures, the internal road system, parking areas, and stormwater detention storage area.



TRANSPORTATION IMPACT ASSESSMENT

Access to and from the site will likely be through the intersection of Higgins Line and Bell's Turn. For vehicles exiting Bell's Turn, there is a stop sign and separate left and right turn lanes. For vehicles turning left from Higgins Line, there is median left turn lane. Estimates of peak hour trip generation indicate that on a typical weekday, 64 vehicle trips may be generated in the morning (16 trips entering/48 trips exiting) and 82 vehicle trips in the afternoon (51 trips entering /31 trips exiting). This is below the threshold triggering a traffic assessment by the City, which is 100 vehicle trips.

HOW TO PROVIDE YOUR COMMENTS AND FEEDBACK

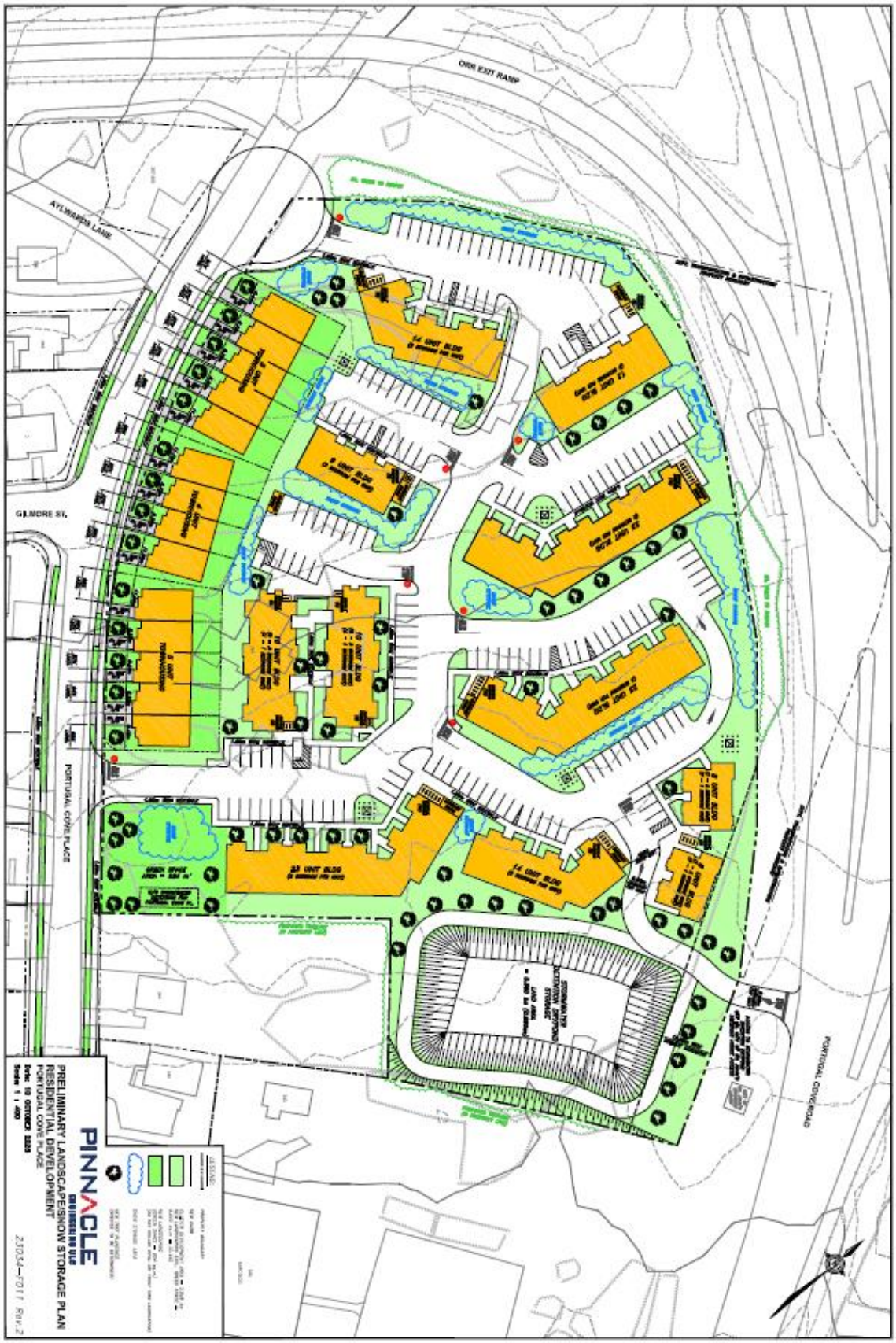
Mail: Gibraltar Fine Homes, 33 Pippy Pl Suite 103, St. John's, NL A1B 3X2

Email: keith@finehomesbygibraltar.com

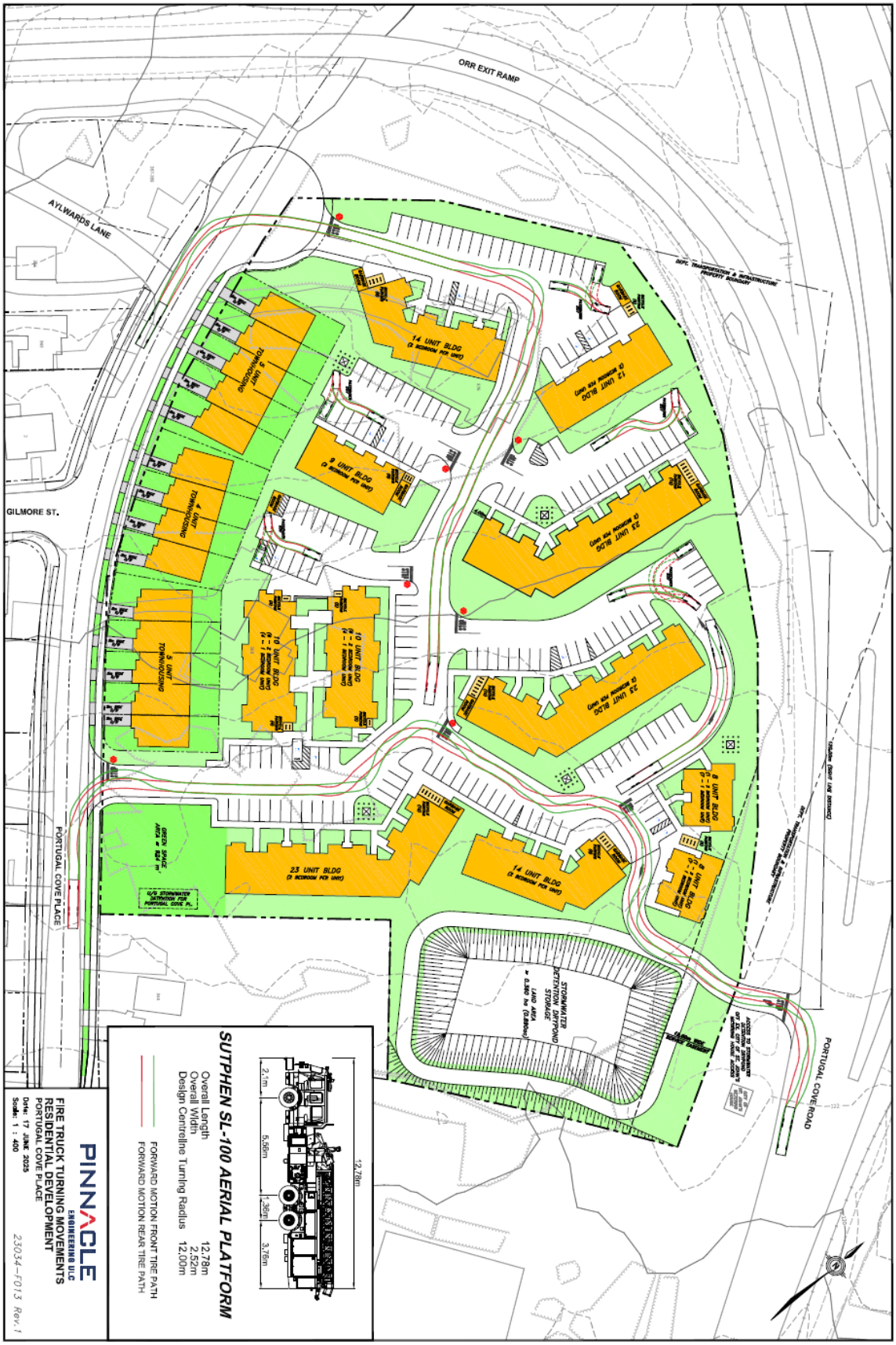
DEADLINE: February 21, 2025

Please note that more detailed drawings and information will be available once an application is made and reviewed with the City of St. John's and further public consultations will be undertaken at that time.

APPENDIX C – CONCEPT PLAN



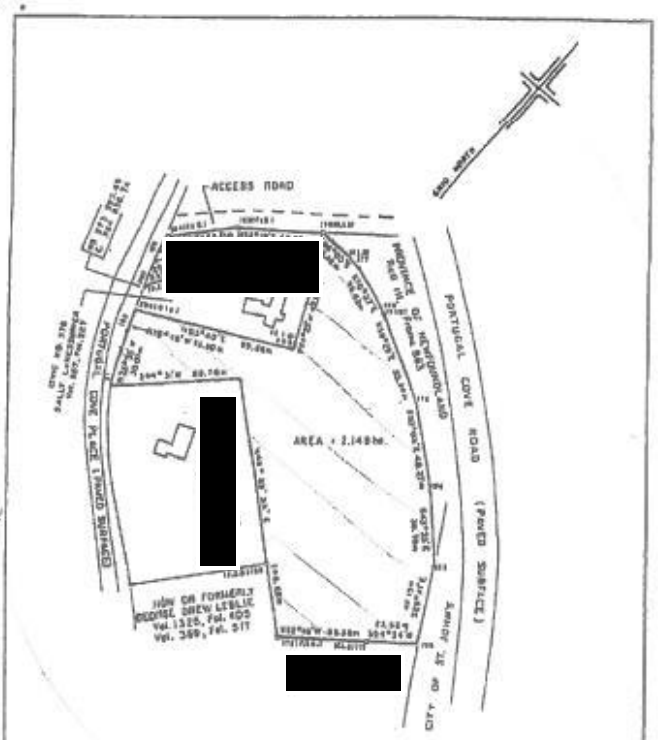
APPENDIX D - ACCESS/EGRESS & FIRE TRUCK MODELLING



APPENDIX E – LEGAL SURVEYS OF SITE

4 1 4 9 2 8 3 4

358 Portugal Cove Pl (1/3)
(Vacant Land portion - approx 5.31 acres)



BROWN SURVEYS & ENGINEERING
Professional Surveying and Engineering Services
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PORTUGAL COVE PLACE ST. JOHN'S

SCALE: 1:2000 DATE: 1994 12 12

JOB NO: 3499 SURVEY: C.D., S.W.

THIS DEED OF ASSENT AND CONVEYANCE made at St. John's in the Province of Newfoundland and Labrador, this 14 day of March, 2018.

BETWEEN: **JASON LEMESSURIER** of the City of St. John's, in the Province of Newfoundland and Labrador, as Executor of the Last Will and Testament of the late **Sarah Louise LeMessurier**, late of the City of St. John's, aforesaid, deceased,

(hereinafter called the "Grantor")

of the first part

AND: **JASON LEMESSURIER** of the City of St. John's, in the Province of Newfoundland and Labrador,

(hereinafter called the "Grantee")

of the second part

WHEREAS the late Sarah Louise LeMessurier was the owner of **ALL THOSE** pieces or parcels of land more particularly described in Schedules "A", "B" and "C" annexed hereto;

AND WHEREAS the said Sarah Louise LeMessurier died on or about the 26th day of September, 2017.

AND WHEREAS Letters of Probate of the Estate of the late Sarah Louise LeMessurier, deceased, were granted by the Supreme Court of Newfoundland and Labrador on the 28th day of December, 2017 to Jason LeMessurier and entered on the 28th day of December, 2017, as Estate

No. 201701E16630;

AND WHEREAS by her Last Will and Testament the said Sarah Louise LeMessurier did devise and bequeath certain pieces or parcels of land as follows:

"I give, devise and bequeath the following real property, including any structures thereon, to my son, Jason LeMessurier, to be his absolutely and forever:

i) The residence and real property situated at 358 Portugal Cove Place, in the City of St. John's, aforesaid, which is my current residence, together with the contents therein;

ii) The residence and real property situated at 376 Portugal Cove Place, in the City of St. John's, aforesaid, which previously belonged to my late parents, together with the contents therein; and

iii) The real property bequeathed to me by my late parents, comprised of 2.184 hectares situated between Portugal Cove Place, aforesaid, and Portugal Cove Road, aforesaid."

NOW THEREFORE I, Jason LeMessurier, as Executor of the Last Will and Testament of Sarah Louise LeMessurier, deceased hereby assents to the devise and bequest aforesaid and pursuant thereto transfer, convey and sell unto the said Grantee **ALL THOSE** pieces or parcels of land being hereinafter more particularly described in Schedules "A", "B" and "C" annexed hereto and being Civic No. 358 Portugal Cove Place, in the City of St. John's, in the Province of Newfoundland and Labrador, Civic No. 376 Portugal Cove Place, in the City of St. John's,

aforesaid, and Portugal Cove Place, in the City of St. John's, aforesaid, which Schedules form part and parcel of these presents, **TOGETHER WITH** all buildings and erections thereon **TO HOLD** the same unto the Grantee absolutely and forever.

IN WITNESS WHEREOF the parties hereto have hereunto subscribed their hands and seals the day and year first before written.

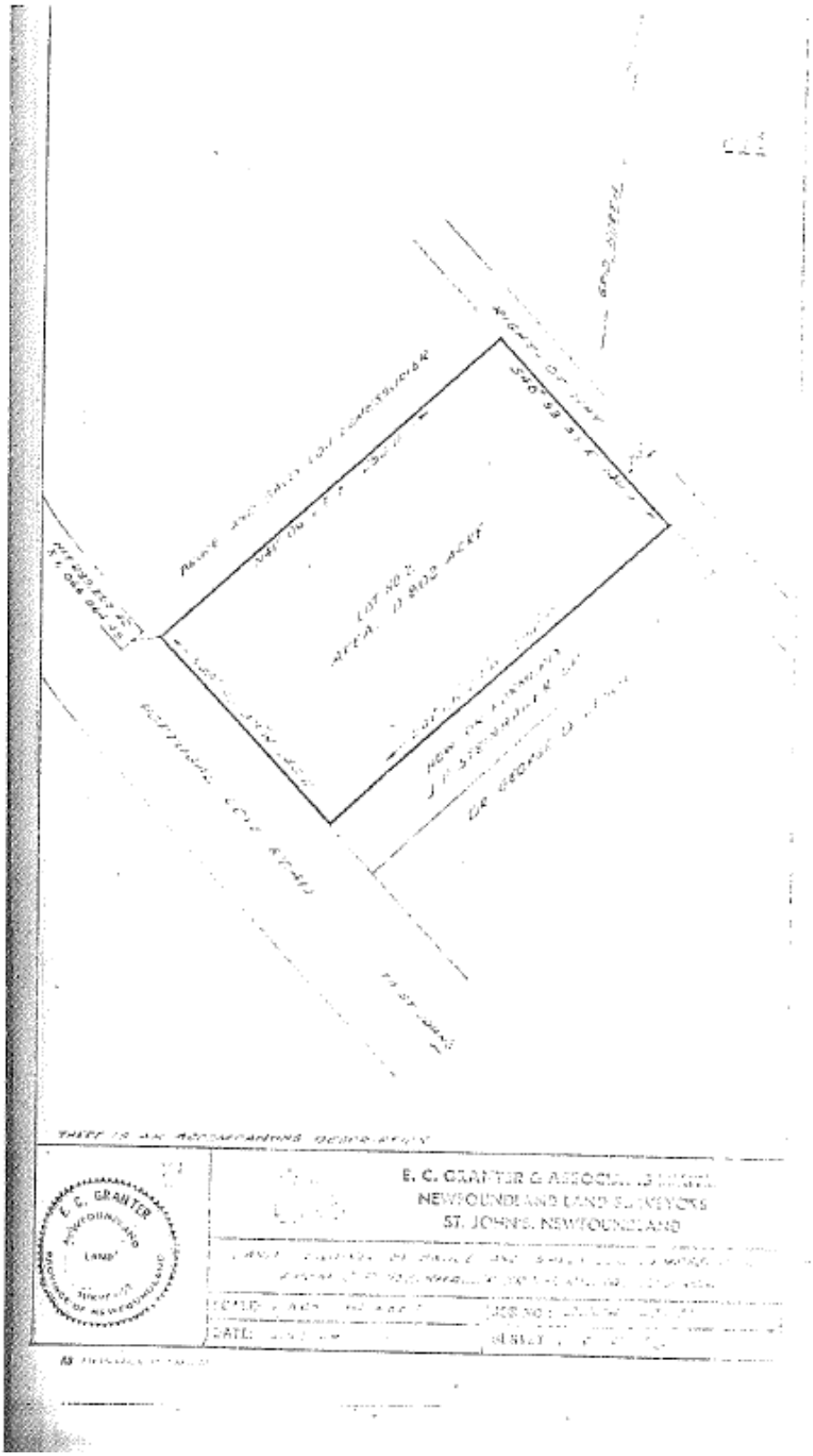
SIGNED, SEALED AND DELIVERED
in the presence of:

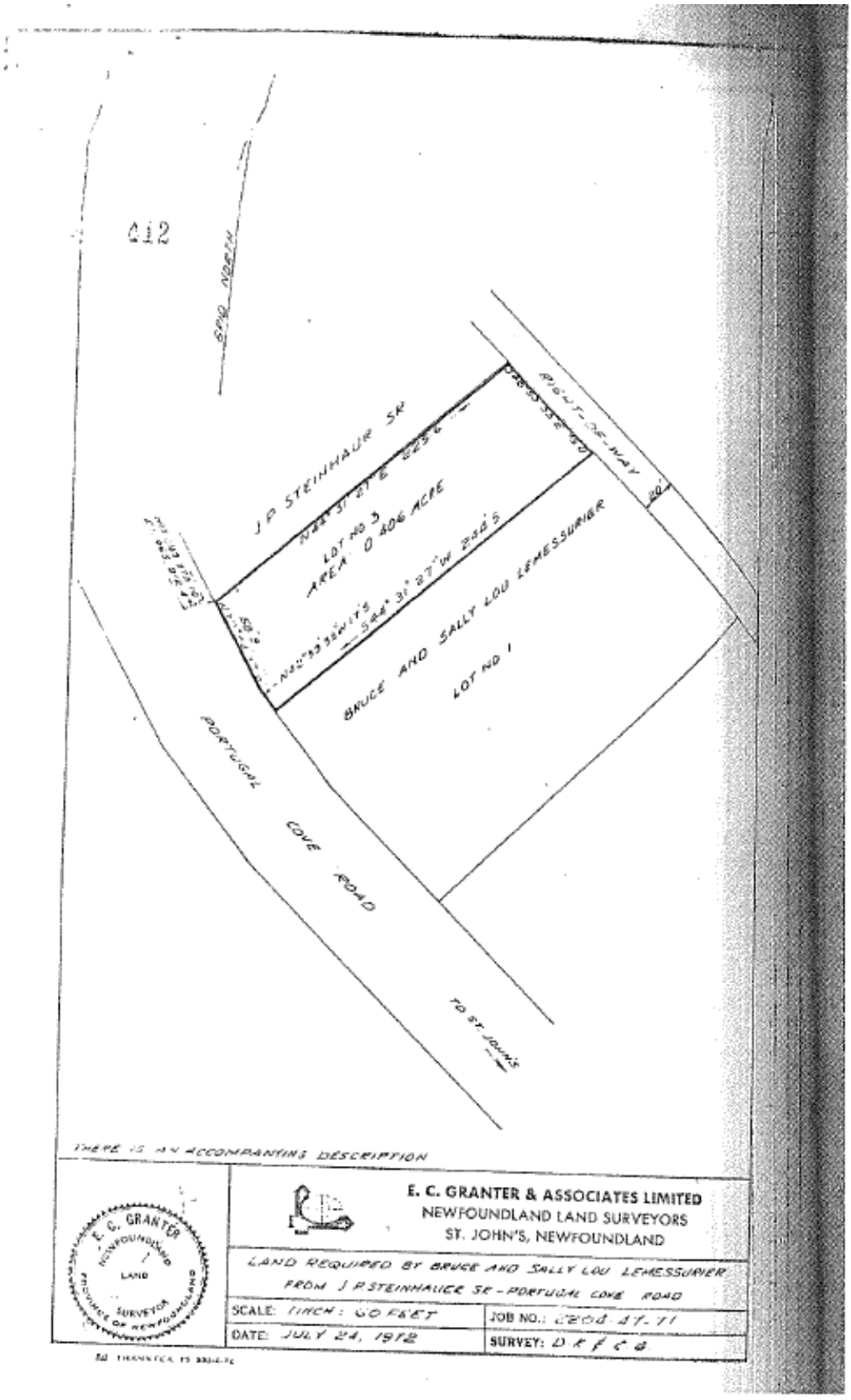
JOHN B. FRENCH
A Barrister of the Supreme
Court of Newfoundland and Labrador

Jason LeMessurier, Executor of the Last Will and Testament of Sarah Louise LeMessurier, deceased

SCHEDULE "A"

ALL THAT piece or parcel of land situate and being on the north side of Portugal Cove Road, in the City of St. John's, in the Province of Newfoundland and Labrador, and being bounded and abutted as follows: THAT IS TO SAY beginning at a point on the North side of Portugal Cove Road, said point having co-ordinates N 17,299,809.42 feet and E 1,066,064.45 feet of the Modified three-degree Transverse Mercator Projection for the Province of Newfoundland and Labrador, thence by land of Bruce and Sally Lou LeMessurier north forty-one degrees six minutes twenty-seven seconds east two hundred and fifty decimal zero (250.0) feet; thence by a right-of-way (20 feet wide) south forty-eight degrees fifty-three minutes thirty-three seconds east one hundred and forty decimal zero (140.0) feet; thence by land now or formerly J. P. Steinhauer, Sr., south forty-one degrees six minutes twenty-seven seconds west two hundred and fifty decimal zero (250.0) feet; thence along the north side of Portugal Cove Road north forty-eight degrees fifty-three minutes thirty-three seconds west one hundred and forty decimal zero (140.0) feet more or less to the point of beginning AND CONTAINING an area of zero decimal eight zero two (0.802) acre. Which land is more particularly shown on a plan No. 2204-47-71 herein attached. All bearings being referred to the above Projection, TOGETHER WITH a right of way (in common with the Vendor and all other persons who may have or hereafter may have a like right) at all times and for all purposes in connection with the use of the land hereby conveyed over the passage way or right of way being twenty (20) feet in width and being adjacent and adjoining the northeastern boundary of the hereinbefore described piece or parcel of land which said right of way is more clearly shown on the said plan No. 2204-47-71 annexed hereto, AND SECONDLY ALL THAT piece or parcel of land situate and being on the north side of Portugal Cove Road, in the City of St. John's, in the Province of Newfoundland and Labrador, being bounded and abutted as follows, THAT IS TO SAY beginning at a point on the north side of Portugal Cove Road, said point having co-ordinates N 17,299,975.10 feet and E 1,065,912.47 feet of the Modified three degree Transverse Mercator Projection for the Province of Newfoundland and Labrador, thence by land of J. P. Steinhauer Sr. north forty-four degrees thirty-one minutes twenty-seven seconds east two hundred and twenty-five decimal six (225.6) feet, thence by a right of way (20 feet wide) south forty-eight degrees fifty-three minutes thirty-three seconds east seventy-five decimal zero (75.0) feet, thence by land of Bruce and Sally Lou LeMessurier south forty-four degrees thirty-one minutes twenty-seven seconds west two hundred and forty-four decimal five (244.5) feet, thence along the north side of Portugal Cove Road north forty-two degrees thirty-nine minutes thirty-three seconds west seventeen decimal five (17.5) feet, north thirty-two degrees four minutes thirty-seven seconds west fifty-eight decimal nine (58.9) feet more or less to the point of beginning AND CONTAINING an area of zero decimal four zero six (0.406) acres. Which land is more particularly shown on plan No. 2204-47-71 hereto attached. All bearings being referred to the above Projection. TOGETHER WITH a right of way (in common with the Vendor and all other persons who may have or hereafter may have a like right) at all times and for all purposes in connection with the use of the land hereby conveyed over the passage way or right of way being twenty (20) feet in width and being adjacent and adjoining the northeastern boundary of the hereinbefore described piece or parcel of land which said right of way is more clearly shown on the said plan No. 2204-47-71 annexed hereto.


LOT NO 3
AREA 13802 ACRE
E. C. GRANTER & ASSOCIATES LIMITED
NEWFOUNDLAND LAND SURVEYORS
ST. JOHNS, NEWFOUNDLAND
E. C. GRANTER
NEWFOUNDLAND
LAND
SURVEYOR
PROVINCE OF NEWFOUNDLAND


412
GRID NORTH
J P STEINHAUER SR
LOT NO 3
AREA 0.406 ACRE
BRUCE AND SALLY LOU LEMESSURIER
LOT NO 1
PORTUGAL COVE ROAD
TO ST JOHN'S
THERE IS AN ACCOMPANYING DESCRIPTION
E. C. GRANTER
NEWFOUNDLAND
LAND
SURVEYOR
PROVINCE OF NEWFOUNDLAND
E. C. GRANTER & ASSOCIATES LIMITED
NEWFOUNDLAND LAND SURVEYORS
ST. JOHN'S, NEWFOUNDLAND
LAND REQUIRED BY BRUCE AND SALLY LOU LEMESSURIER
FROM J P STEINHAUER SR - PORTUGAL COVE ROAD
SCALE: 1 INCH = 60 FEET
JOB NO.: C208-47-11
DATE: JULY 24, 1972
SURVEY: D R F C B

4 1 4 9 2 8 3 5

Schedule "B"

December 12, 1994

Job No. 5499-1

DESCRIPTION

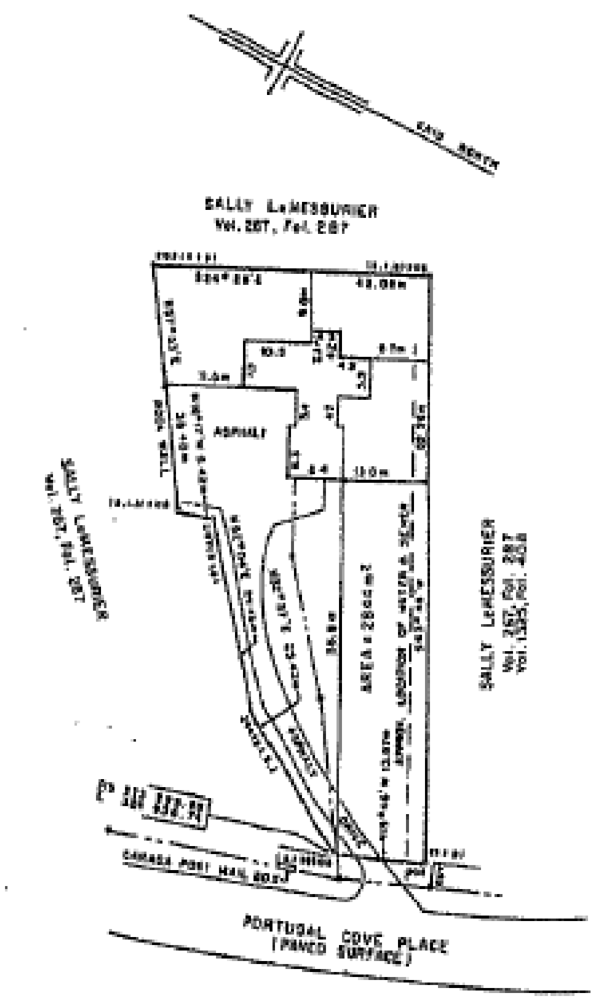
CIVIC NO. 376 PORTUGAL COVE PLACE

ST. JOHN'S, NF

ALL THAT piece or parcel of land, situate and being on the east side of Portugal Cove Place, in the City of St. John's, in the Province of Newfoundland, Canada, and being bounded and abutted as follows: THAT IS TO SAY, beginning at a point on the eastern side of Portugal Cove Place, said point having coordinates N 5 273 295.69 metres and E 324 938.74 metres of the Three Degree Modified Transverse Mercator Projection for the Province of Newfoundland, Canada, THENCE by property of Sally LeMessurier N 32°37' E for a distance of 25.42 metres, THENCE N 52°04' E for a distance of 29.48 metres, THENCE N 16°17' W for a distance of 5.42 metres, THENCE N 57°53' E for a distance of 38.40 metres, THENCE S 24°25' E for a distance of 42.08 metres, THENCE S 63°48' W for a distance of 89.96 metres, THENCE along the eastern side of Portugal Cove Place N 19°46' W for a distance of 13.67 metres, more or less to the point of beginning and containing an area of 2844 square metres. Which land is more particularly shown on the plan hereto attached. All bearings being referred to the above mentioned projection. All linear measurements are horizontal ground distances.

This description and accompanying plan, Job # 5499 -1 of Brown Surveys & Engineering, form an integral part of the returns and are not separable.

Brown Surveys & Engineering



CONTROL MONUMENT	△
FOUND IRON BAR	
SET IRON BAR	
POLE OR LIGHT STANDARD	
PROPERTY DEALT WITH	
FENCE LINES	
POWER + TELEPHONE LINE	
EASEMENT	
HEDGE	

All these measurements are horizontal ground distances.

This Plan Certifies The Information Shown As Of 1994 12 12 And Only Of That Date.

All Distances Shown Are Metric (m).

This is Page 3 of 3 For The Real Property Report.

Surveyed by : Brown Surveys & Engineering Ltd.

BROWN SURVEYS & ENGINEERING

Professional Surveying and Engineering Services

Telephone: (709) 726-1040 Telecopier: (709) 726-1041

Peter M. Brown — Newfoundland Land Surveyor — Province of Newfoundland

LEGAL SURVEY & REAL PROPERTY REPORT

SALLY LeMESSURIER

376 PORTUGAL COVE PLACE ST. JOHN'S

SCALE:	1: 750	DATE:	1994 12 12
JOB NO:	5490-1	SURVEY:	C.D., S.W.

December 12, 1994

Job No. 5499

DESCRIPTION

PROPERTY OF SALLY LeMESSURIER

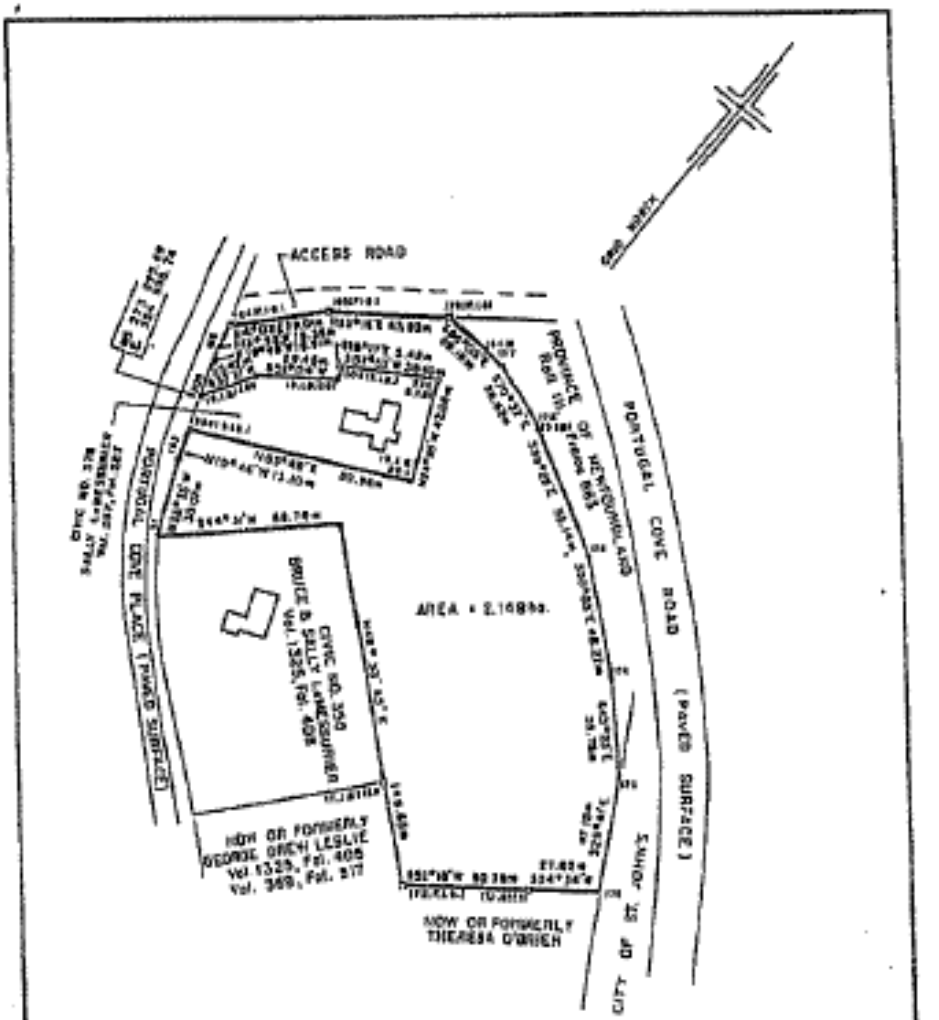
PORTUGAL COVE PLACE

ST. JOHN'S, NF

ALL THAT place or parcel of land, situate and being on the east side of Portugal Cove Place, in the City of St. John's, in the Province of Newfoundland, Canada, and being bounded and abutted as follows: THAT IS TO SAY, beginning at a point on the eastern side of Portugal Cove Place, said point having coordinates N 5 273 295.69 metres and E 324 938.74 metres of the Three Degree Modified Transverse Mercator Projection for the Province of Newfoundland, Canada, THENCE along the eastern side of Portugal Cove Place N 19°46' W for a distance of 16.91 metres, THENCE N 15°32' W for a distance of 13.39 metres, THENCE along the southern side of an Access Road N 41°03' E for a distance of 39.01 metres, THENCE N 53°16' E for a distance of 47.93 metres,THENCE by property of the Province of Newfoundland S 86°05' E for a distance of 29.18 metres, THENCE S 70°37' E for a distance of 28.62 metres, THENCE S 59°29' E for a distance of 55.14 metres, THENCE S 50°03' E for a distance of 48.27 metres, THENCE S 43°23' E for a distance of 39.78 metres, THENCE by property of the City of St. John's S 29°41' E for a distance of 47.15 metres, THENCE by property now or formerly Theresa O'Brien S 54°34' W for a distance of 27.62 metres, THENCE S 52°16' W for a distance of 50.58 metres, THENCE by property now or formerly George Drew Leslie and by property of Bruce and Sally LeMessurier N 48°53'33" W for a distance of 148.65 metres, THENCE by property of Bruce and Sally LeMessurier S 44°31' W for a distance of 68.76 metres, THENCE along the eastern side of Portugal Cove Place N 28°35' W for a distance of 30.07 metres, THENCE N 19°46' W for a distance of 13.10 metres, THENCE by property of Sally LeMessurier N 63°48' E for a distance of 89.96 metres, THENCE N 24°25' W for a distance of 42.08 metres, THENCE S 57°53' W for a distance of 38.40 metres, THENCE S 16°17' E for a distance of 5.42 metres, THENCE S 52°04' W for

a distance of 29.48 metres, THENCE S 32°37' W for a distance of 25.42 metres, more or less to the point of beginning and containing an area of 2.148 hectares. Which land is more particularly shown on the plan hereto attached. All bearings being referred to the above mentioned projection. All linear measurements are horizontal ground distances.

This description and accompanying plan, Job # 5499 of Brown Surveys & Engineering, form an integral part of the returns and are not separable.



Monuments used for tie-in, Zone 5 NAD - 83

800 2273 N 5 272 134.818 E 325 609.354

800 2274 N 5 271 920.003 E 325 670.160

All linear measurements are horizontal ground distances.

For the computation of coordinates, horizontal ground distances have been reduced to the UTM, 3° M T M Projection plane by multiplying them by an average combined scale factor of 0.999884

Peter M. Brown NEWFOUNDLAND LAND SURVEYOR PROVINCE OF NEWFOUNDLAND

BROWN SURVEYS & ENGINEERING

Professional Surveying and Engineering Services

Telephone: (709) 726-1049 Telecopier: (709) 726-1041

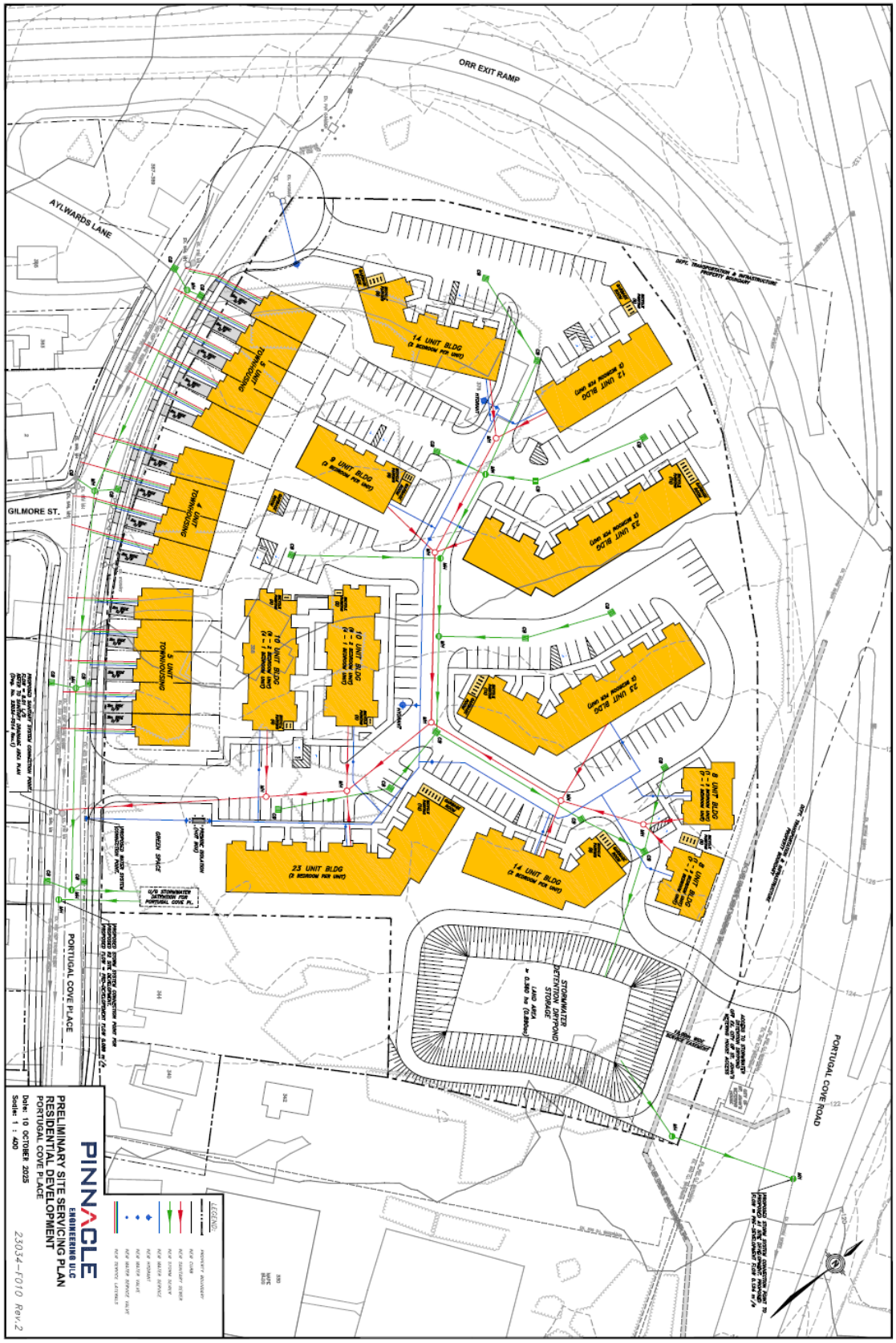
LEGAL SURVEY

SALLY LeMESSURIER

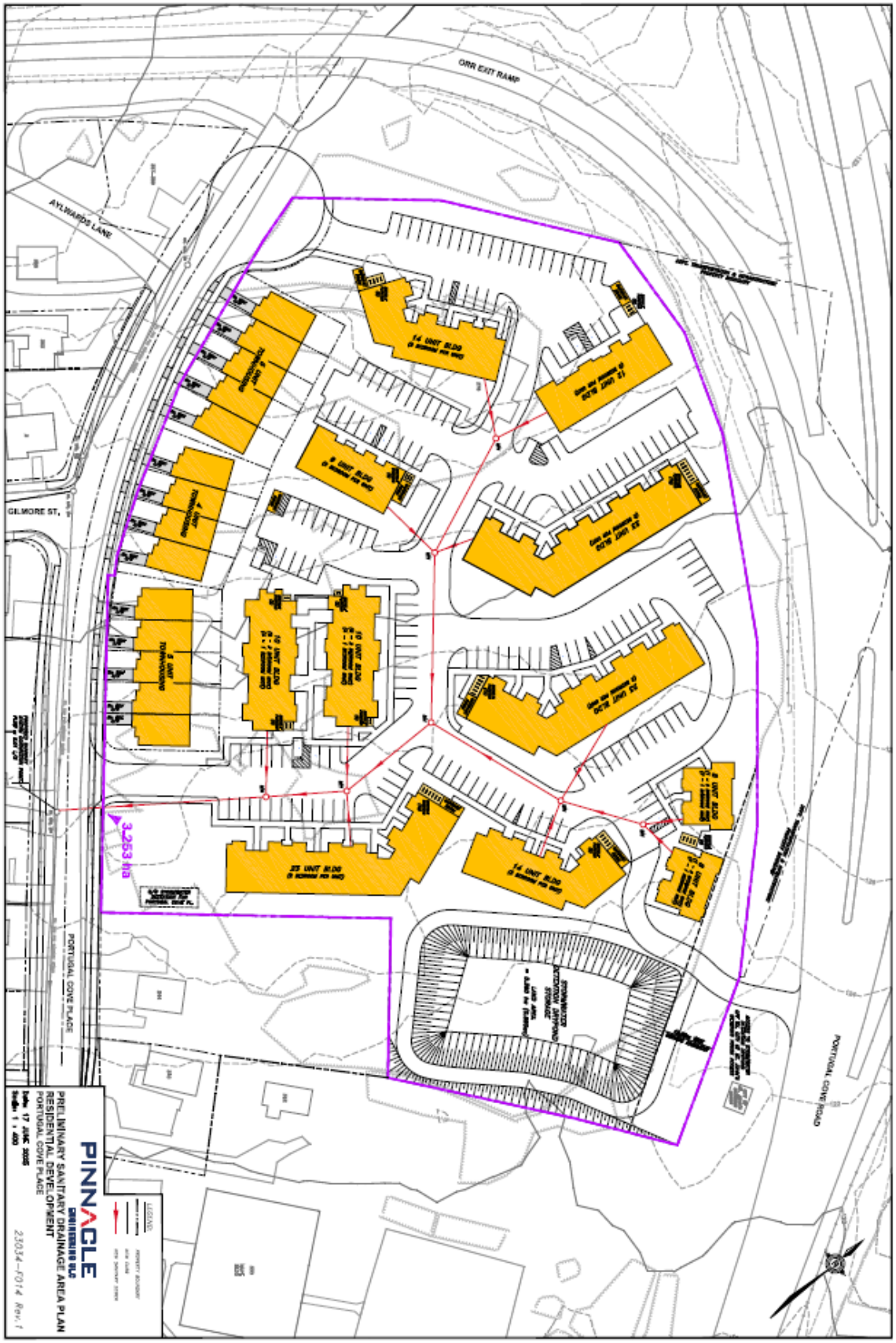
PORTUGAL COVE PLACE ST. JOHN'S

SCALE: 1:2000	DATE: 1994 12 12
JOB NO: 5499	SURVEY: G.D., S.W.

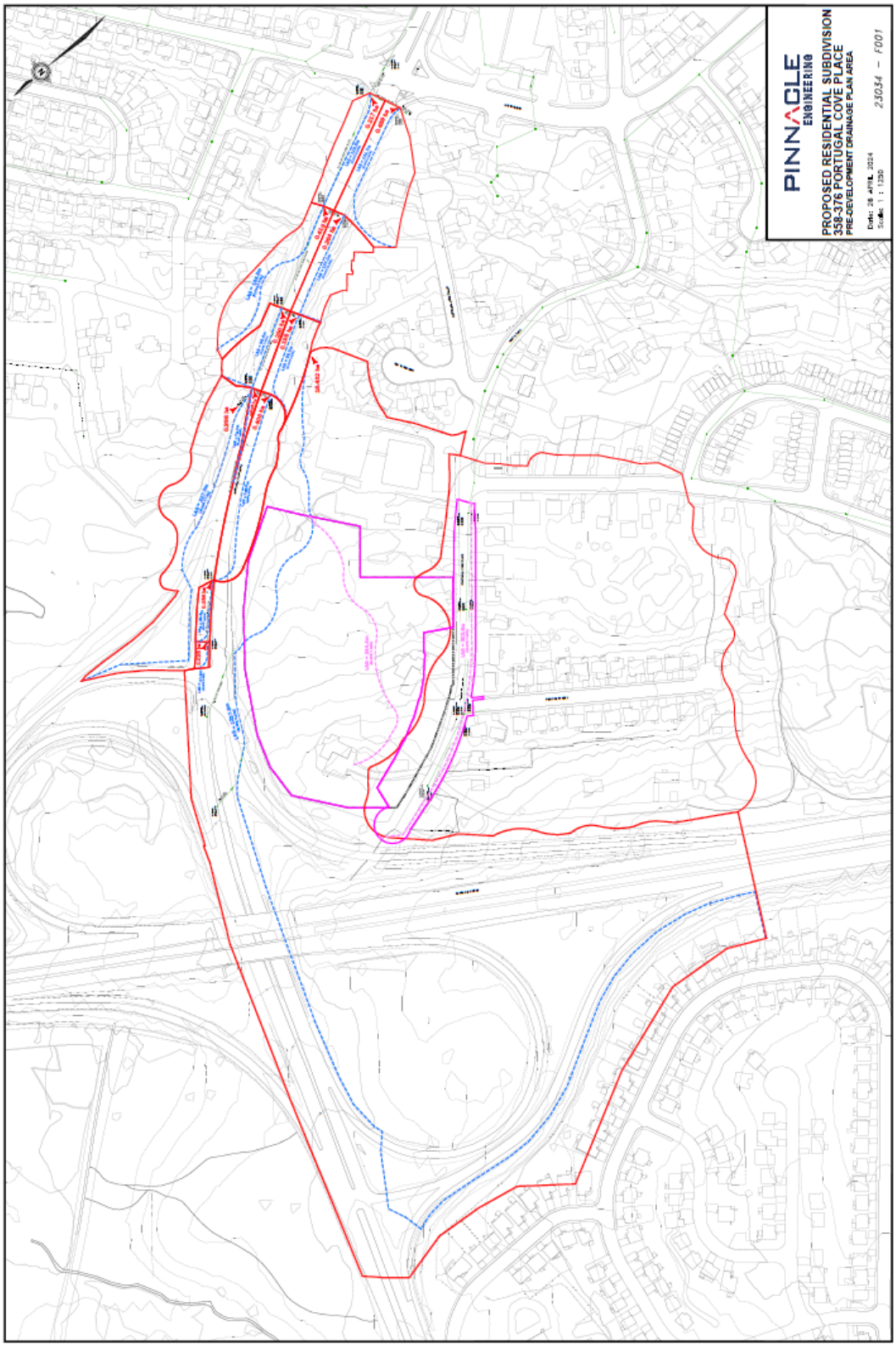
APPENDIX F- SITE SERVICES



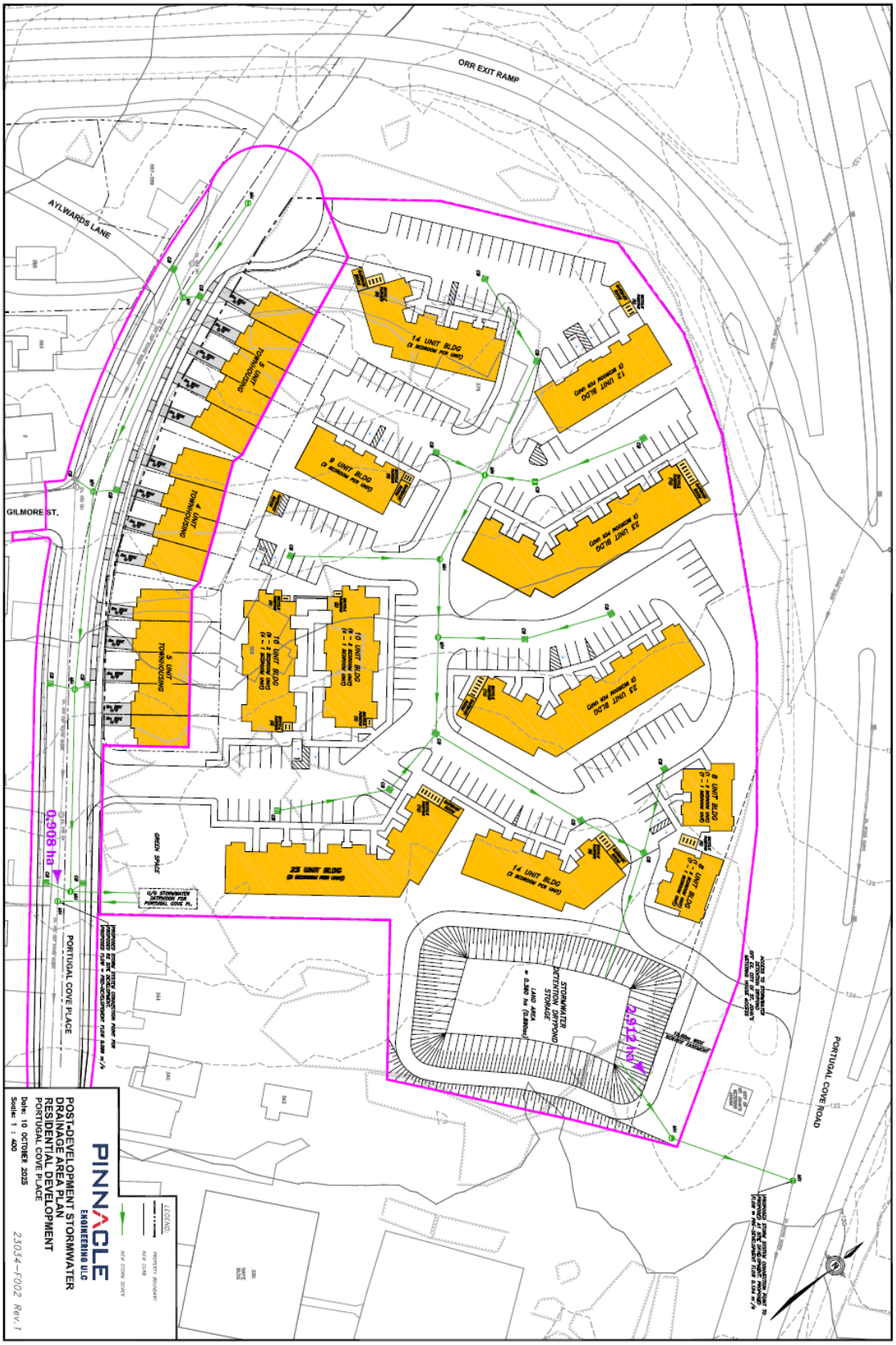
APPENDIX G-SANITARY DRAINAGE AREA PLAN



APPENDIX H-PRE-DEVELOPMENT STORMWATER DRAINAGE AREA PLAN



APPENDIX I-POST-DEVELOPMENT STORMWATER DRAINAGE/AREA PLAN



APPENDIX J-SANITARY CALCULATIONS

PINNACLE ENGINEERING

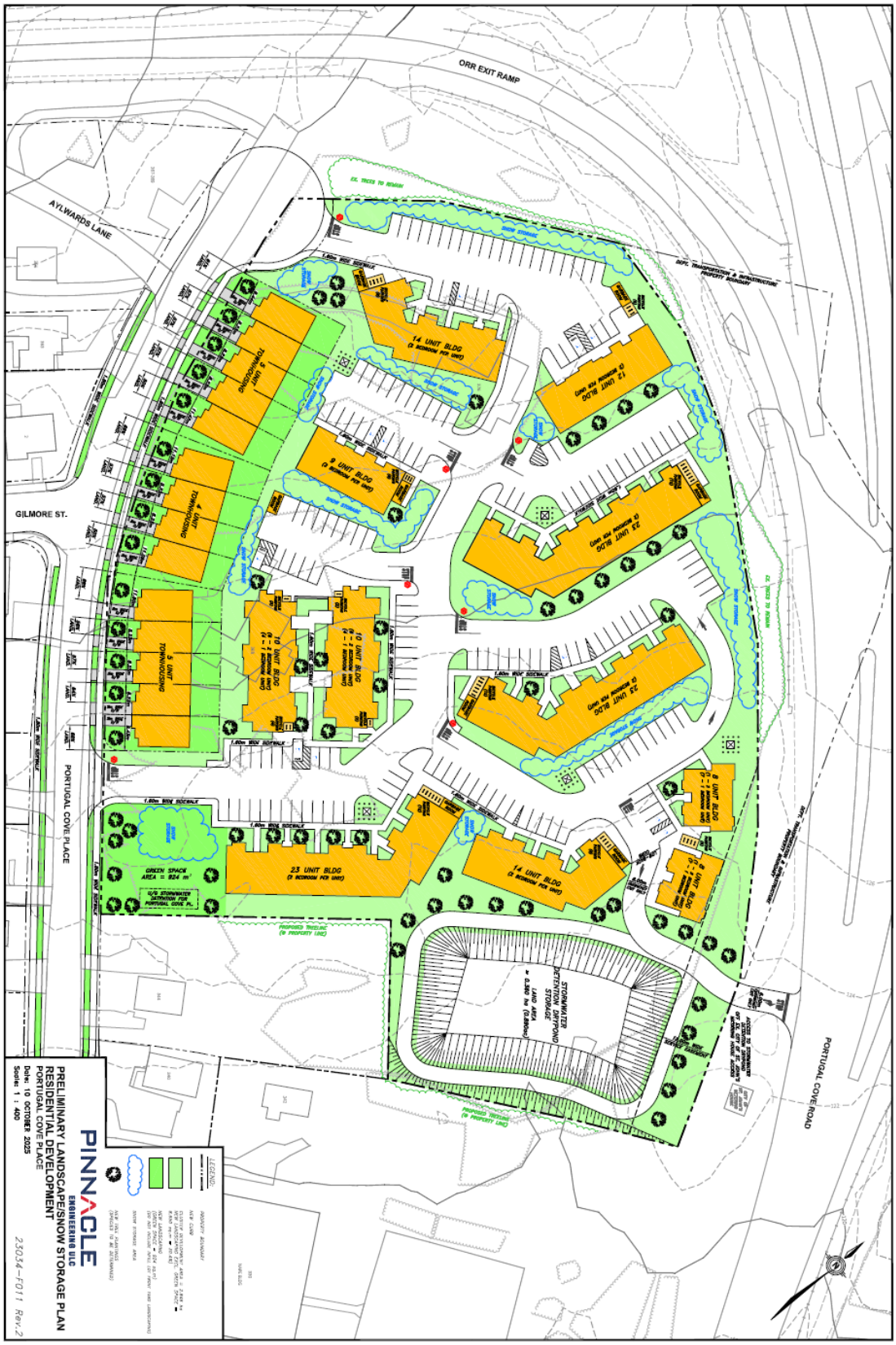
Peak Design Flows & Sanitary Sewer Main Design

PN 23034
Description: Sanitary Sewer Analysis
Sanitary Drainage Area Plan:
Rev: 1

Average Residential Population Density: 140 people/ha
Unit of Manhole Inflow in Sag Location, S: 0.40 l/s
Inflow and Infiltration Allowanace, I: 0.30 l/s

Location/Zoning				Peak Design Flows							Sanitary Sewer Main Design									
LOCATION	FROM	TO	Land Use	Tributary Area	Total Area	Design Population	Peaking Factor	Average Daily per Capita Domestic Flow	No. of Manholes in Sag Location	Peak Design Flow	LENGTH	SLOPE	PIPE DIAMETER	CROSS-SECTIONAL AREA	WETTED PERIMETER	HYDRAULIC RADIUS	PIPE CAPACITY	CAPACITY AVAILABLE	FULL VELOCITY
				A		P	M	q	N	Qs		S		A	P	R	Qc		
				(ha)	(ha)	(1/1000)		(l/cap/d)	(l/s)	(l/s)	(m)	(m/m)	(mm)	(m^2)	(m)	(m)	(l/s)	(%)	(m/s)
Civic 358-376	MH	Ex. MH	Res	3.25	3.25	0.5	3.99	380.00	0	**8.01**	29.5	0.0100	200	0.0314	0.628	0.050	32.5	75.3%	1.03

APPENDIX K- LANDSCAPING/SNOW STORAGE



APPENDIX L – TRANSPORTATION

358 PORTUGAL COVE PLACE
TRAFFIC IMPACT STUDY

SUBMITTED BY:
Harbourside Transportation Consultants
Suite 301, Terrace on the Square, 8 Rowan Street
P.O. Box 23169, RPO Churchill Square

Contact: Mark Stuckless
Email: mstuckless@harboursideengineering.ca
Phone: +1-709-579-6435
Date: 2026-Jan-23
File No. 252038

4	Updated Draft – Additional discussion regarding PHFs added to Section 7	F.Allaire	2026-02-04	M.Stuckless
3	Updated Draft - Site Plan and Analysis Updated	F.Allaire	2026-01-23	M.Stuckless
2	Updated Draft - Additional Traffic Count Data	F.Allaire	2025-12-18	M.Stuckless
1	Site plan updated	F.Allaire	2025-07-09	M.Stuckless
0	Draft for client review	F.Allaire	2025-07-09	M.Stuckless
Rev #	**Reason for Issue**	**Reviewed by**	**Date**	**Issued by**

Contents

Tables

Figures

Appendices

1. INTRODUCTION

1.1. OVERVIEW

Harbourside Transportation Consultants has completed a transportation impact study (TIS), as required by the City of St. John's, relating to the development application for a proposed residential development on Portugal Cove Place in St. John's, NL.

1.2. SCOPE

The TIS generally follows the City of St. John's *Standard Terms of Reference – Transportation Assessment*[1]. The scope of the TIS includes:

- Assessment of the current traffic conditions within the study area,
- Estimates of background traffic growth,
- Estimates of traffic generated by the subject site,
- Assessment of the impact of future traffic on the study area road network, and
- Recommendations necessary to mitigate the impacts of site-generated traffic.

1.3. STUDY AREA

The subject site is located on Portugal Cove Place and encompasses Civic Nos. 358 and 376 Portugal Cove Place. There are two existing single-family homes on the site, which will be demolished as part of the redevelopment. The site context is shown in Figure 1. The study area includes the intersection of Higgins Line and Bell's Turn.

[1] *Standard Terms of Reference – Transportation Assessment*, City of St John's, June 2023.

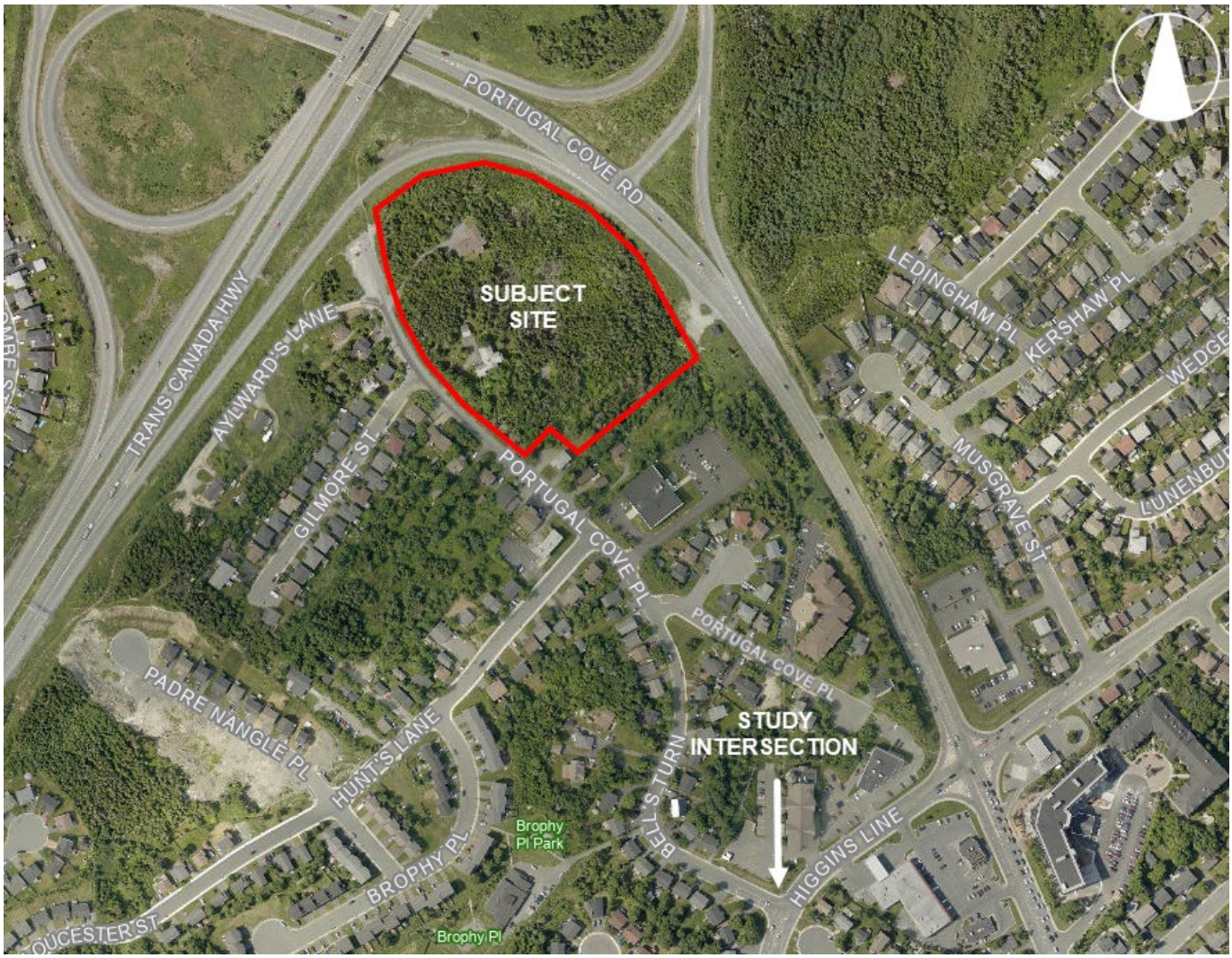


Figure 1: Development Site Context

2. EXISTING TRANSPORTATION NETWORK

2.1. ROAD NETWORK

The roadways of interest within the study area include:

- **Portugal Cove Place:** is a local roadway with a two-lane cross section and a speed limit of 50 km/h. Portugal Cove Place runs northwest-southeast approximately parallel to Portugal Cove Road and consists of two cul-de-sac segments. The northern segment connects directly with Bell's Turn which continues and intersects with Higgins Line. The southern segment forms a stop-controlled t-intersection where the northern segment and Bell's Turn meet. There is sidewalk on both sides of Bell's Turn from Higgins Line to Brother McSheffrey Lane. Sidewalk continues along the east side of Bell's Turn and the northern segment of Portugal Cove Place and Bell's Turn between Brother McSheffrey Lane and Hunt's Lane. Sidewalk is located on the west side of the southern segment of Portugal Cove Place.

- **Portugal Cove Road**: is an arterial roadway that generally runs northwest-southeast adjacent to the site. Portugal Cove Road has a cross section that varies between four and five lanes, with two through lanes in each direction and intermittent median left turn lanes at intersections. Portugal Cove Road has a posted speed limit of 50 km/h with sidewalks on both sides south of the intersection with Higgins Line/Newfoundland Drive and with no sidewalk north of that intersection.
- **Higgins Line:** is an arterial roadway with a posted speed limit of 50 km/h that generally runs north-south between Portugal Cove Road and Allandale Road. Higgins Line has a five-lane cross section with two through lanes in each direction and a median left turn lane. Sidewalks are provided on both sides of Higgins Line. Great Eastern Avenue: a collector roadway that runs east-west between Kenmount Road and Ladysmith Drive. Great Eastern Avenue has a two-lane cross section with on-street parking lanes in both directions, and a posted speed limit of 50km/h. There are sidewalks on both sides of Great Eastern Avenue.

2.2. STUDY INTERSECTION

The intersection of Higgins Line and Bell's Turn is a 3-leg stop-controlled intersection. The northbound approach (Higgins Line) has two through lanes and a left turn lane storage lane. The southbound approach (Higgins Line) has a through lane and a shared through right lane. The eastbound approach (Bell's Turn) has one left turn lane and one right turn lane.

2.3. WALKING AND CYCLING

Sidewalks are provided on one or both sides of the local roadways between Hunt's Lane and Higgins Line. There are no marked crosswalks on Portugal Cove Place or Bell's Turn. There is a pedestrian path from the southern segment of Portugal Cove Place to the intersection of Portugal Cove Road and Higgins Line/Newfoundland Drive, however this pathway has sections with stairs, and appears to cross private property. There are controlled crosswalks at the signalized intersection of Portugal Cove Road and Higgins Line/Newfoundland Drive. There is no existing cycling infrastructure within the study area.

2.4. TRANSIT

Bell's Turn is serviced by three Metrobus routes:

- Route 9 – MUN | Torbay Road | Logy Bay Road
- Route 14 – Airport | Torbay Road | MUN
- Route 23 – Avalon | MUN | Stavanger

The nearest stop is located a Civic No. 4 Hunt's Lane (Bus Stop ID: 3400) less than 150 metres (2-minute walk) from the edge of the site.

Two additional routes can be accessed on Higgins Line:

- Route 1 – Village | Institutes
- Route 13 – Village | Institutes EXPRESS

The nearest stop on Higgins Line is located at the former Super 8 Hotel (Bus Stop ID: 1175) approximately 500 metres (7-minute walk) from the edge of the site.

3. TRAFFIC VOLUMES

Turning movement counts were collected at the study intersection using Miovision 'Scout' video data collection devices on Thursday, May 22nd, 2025. The turning movement count recorded traffic data during the morning peak period (6:30 and 9:30 AM), mid-day peak period (12:00 and 2:00 PM) and afternoon peak period (3:30 and 6:30 PM). Motor vehicles (classified as lights, mediums and articulated trucks), pedestrian and bicycle volumes were reported in 15-minute intervals. Feedback from area residents, collected during the City's public consultation process, indicated that traffic volumes were probably lower at the time of the May 22nd, 2025 count as Memorial University and other post secondary institutions (e.g. College of the North Atlantic) had finished their winter semesters. A second turning movement count was subsequently collected on Tuesday, December 2nd, 2025. **Appendix A** contains the data for both traffic counts.

Figure 2 illustrates the existing traffic volumes for the weekday morning (AM) and afternoon (PM) peak hour for the May 22nd, 2025 count. Figure 3 illustrates the existing traffic volumes for the weekday morning (AM) and afternoon (PM) peak hour for the December 2nd, 2025 count.

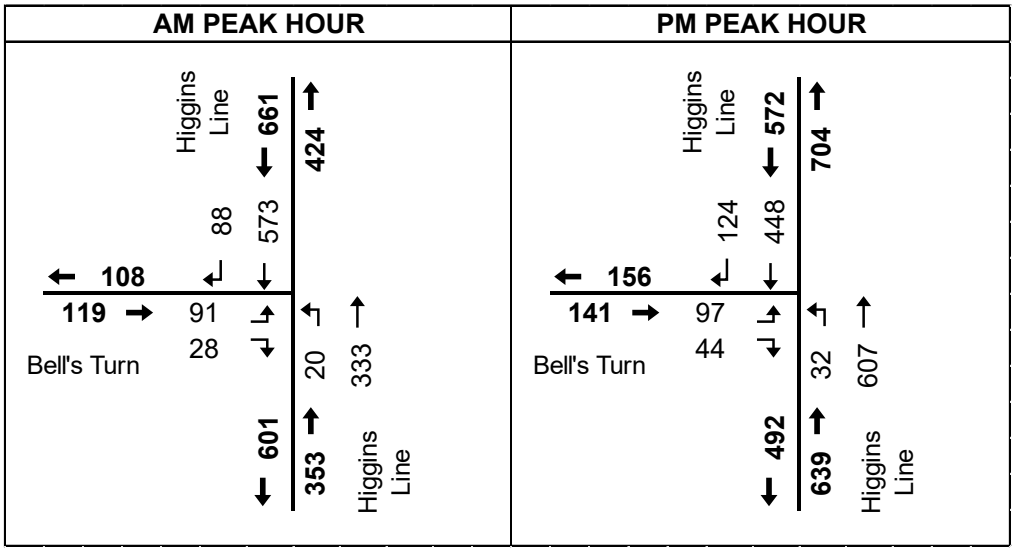


Figure 2: Existing Traffic Volumes – May 22nd, 2025

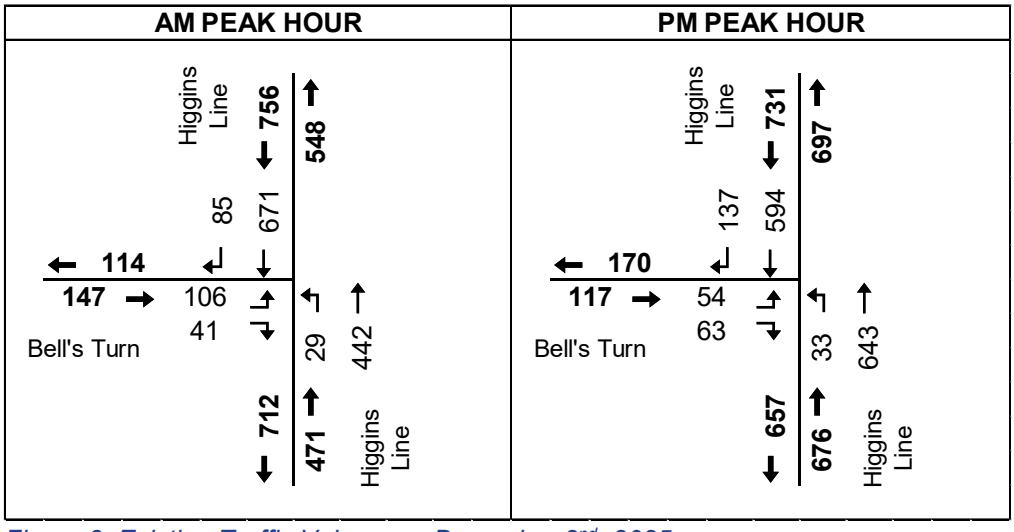


Figure 3: Existing Traffic Volumes – December 2nd, 2025

4. DEVELOPMENT CONCEPT

4.1. DEVELOPMENT DESCRIPTION

The residential development will consist of single-family attached housing (townhouses) along the frontage on Portugal Cove Place and multifamily low-rise residential buildings. The development will include a total of 168 residential units, including 14 single-family attached units and 154 multifamily low-rise units comprised of 22 1-bedroom units and 132 2-bedroom units, housed in 11 multifamily low-rise residential buildings). The proposed site development plan is shown in Figure 3.

Access to the single-family attached units along Portugal Cove Place will be provided through individual driveways. Access to the residential buildings is proposed through two driveways on Portugal Cove Place: one located at the southeast end of the site and one on the northwest end of the site in the cul-de-sac bulb. An additional emergency only egress point is proposed on Portugal Cove Road.

Parking for the multifamily units will be provided on site. 184 vehicle parking spaces (including 12 barrier free spaces) and 74 bicycle parking spaces are included on the subject site.

The proposed site plan includes upgrades to Portugal Cove Place including the installation of sidewalk on both sides of the roadway from Hunt's Lane to Aylward's Lane on the west side and from Hunt's Lane to the northern site access located in the cul-de-sac bulb on the east side. The proposed sidewalk will connect the development to existing sidewalk on Portugal Cove Place and provide a connection to transit stops on Hunt's Lane and Higgins Line. Sidewalk is also provided throughout the site with connections to Portugal Cove Place at both access points.

Figure 4: Site Plan

4.2. ACCESS SIGHT DISTANCE REVIEW

A sight distance review was completed for the site access points on Portugal Cove Place to confirm that the sight lines meet the minimum stopping and intersection sight distance requirements of the Transportation Association of Canada's (TAC) *Geometric Design Guide for Canadian Roads*[2].

4.2.1. Site Accesses on Portugal Cove Place

The minimum stopping and intersection sight distance requirements for accesses on Portugal Cove Place, a two-lane roadway with a design speed of 50 km/h are:

- Minimum stopping sight distance = 65 metres,
- Minimum intersection sight distance – left-turn from stop = 105 metres, and
- Minimum intersection sight distance – right-turn from stop = 95 metres.

The sight line south of the southern access (looking to the left) meets the minimum intersection sight distance for a right-turn of 95 meters. The sight line north of the southern access (looking to the right) meets the minimum intersection sight distance for a left turn of 105 meters. It is noted however that vehicles parked in the proposed townhouse driveways may intermittently reduce this line of sight which is

[2] *Geometric Design Guide for Canadian Roads*, Transportation Association of Canada, June 2017.

not uncommon in residential developments. The minimum stopping sight distance can still be achieved with a vehicle parked in the closest driveway if the vehicle exiting the southern site access is positioned at the curb line, meaning vehicles may be required to advance onto the sidewalk to see beyond parked vehicles. The stopping sight distance of 65 meters is also met in both directions for vehicles travelling on Portugal Cove Place.

The northern access will be located off the cul-de-sac bulb. Sight lines will only be required in one direction - south of the northern access (looking to the left). Again, this line of sight will be intermittently restricted by vehicle parked in the proposed townhouse unit driveways. Without parked vehicles there will be approximately 65 metres of intersection sight distance and with parked vehicles the sight distance is reduced to approximately 45 metres. While the intersection sight distance will not meet the requirements for a speed of 50 km/h, speeds approaching the cul-de-sac can reasonably be assumed to be lower, and the volume of conflicting vehicles (i.e. vehicles continuing past the driveway to go around the cul-de-sac bulb) is anticipated to be very low. Without parked vehicles, stopping sight distance is available for vehicles approaching at 50 km/h. Given the location of this driveway, the speed reduction necessary for vehicles approaching the cul-de-sac bulb, and the anticipated very low volume of vehicles that would conflict with vehicles exiting the driveway, this is not a significant concern. A concealed intersection sign (WA-13R) could be considered but is not deemed necessary. General TAC guidance indicates that "concealed or unexpected intersection signs should not be used to warn of private driveways on entrances".

4.2.2. Emergency Access on Portugal Cove Road

It is expected that this will be a controlled (restricted) access that is not regularly used. That said, the minimum stopping and intersection sight distance requirements for the right turn from the emergency exit onto Portugal Cove Road based on a design speed of 80 km/h (posted speed limit + 10 km/h) are:

- Minimum stopping sight distance = 130 metres, and
- Minimum turning sight distance – right-turn from stop = 145 metres.

The sight line north of the access (looking to the left) toward vehicles on Portugal Cove Road and vehicles travelling on the TCH eastbound off ramp is expected to meet the minimum turning sight distance for a right-turn of 145 meters. The stopping sight distance requirement is also met for vehicles travelling on Portugal Cove Road and on the TCH eastbound off ramp.

4.3. PARKING

The *Envision St. John's Development Regulations*[3] prescribe minimum parking requirements for various building occupancy/use types. The building use types for this development are classified as 'Apartment Building' for the low-rise residential buildings, and 'Residential Use' for the single-family attached units.

For the 'Apartment Building' uses, the minimum parking requirement for the subject site is 152 spaces for residents and 21 parking spaces for visitors, resulting in a total of 173 spaces. The site's parking supply of 184 spaces satisfies the minimum parking requirement.

Bicycle parking is also required for the 'Apartment Building' classification. The required minimum is 77 bicycle parking spaces for the subject site. While the current site plan shows 74 bicycle parking spaces, enough spaces will be provided to satisfy the minimum requirement.

[3] *Envision St. John's Development Regulations*, City of St. John's, July 2024.

For the 'Residential Use' uses, the minimum parking requirement for the subject site is 14 spaces. Parking for the single-family attached units will be accommodated on the individual driveways for each unit. Each of the 14 driveways can accommodate at least one parked vehicle.

4.4. SITE-GENERATED TRAFFIC

4.4.1. Trip Generation

The Institute of Transportation Engineers (ITE) *Trip Generation Manual*[4] was used to estimate the vehicle trip generation for the proposed site land uses. Table 1 summarizes the trip generation rates for the land use codes.

Table 1: Trip Generation Rates

Land Use	AM Peak Hour			PM Peak Hour		
	Rate	Entering	Exiting	Rate	Entering	Exiting
215 Single-Family Attached Housing	0.47	25%	75%	0.51	57%	43%
220 Multifamily Housing (Low-Rise)	0.41	24%	76%	0.52	62%	38%
Note: Rates are in trips per dwelling unit.						

The weekday morning (AM) and afternoon (PM) peak hour trip generation estimates for the site are summarized in Table 2. On a typical weekday, the site is estimated to generate 70 vehicle trips in the morning peak hour (17 trips entering and 53 trips exiting) and 87 vehicle trips in the afternoon peak hour (54 trips entering and 33 trips exiting).

Table 2: Trip Generation Estimates

Land Use	Units	AM Peak Hour			PM Peak Hour		
		Total	Entering	Exiting	Total	Entering	Exiting
215 Single-Family Attached Housing	14	7	2	5	7	4	3
220 Multifamily Housing (Low-Rise)	154	63	15	48	80	50	30
Total Trips		70	17	53	87	54	33

4.4.2. Trip Assignment and Distribution

To remain conservative, it was assumed that all site-generated trips would travel to/from the development via Bell's Turn. All vehicle trips were assigned to Bell's Turn and distributed on Higgins Line based on existing travel patterns observed in the December 2nd, 2025 traffic count. Table 3 summarizes the trip distributions assumptions. Figure 4 illustrates the distribution of site-generated traffic for the weekday AM and PM peak hours.

[4] Trip Generation Manual, 12th edition, Institute of Transportation Engineers, August 2025.

Table 3: Trip Distribution Assumptions

Origin/Destination	Distribution
North	70%
South	30%

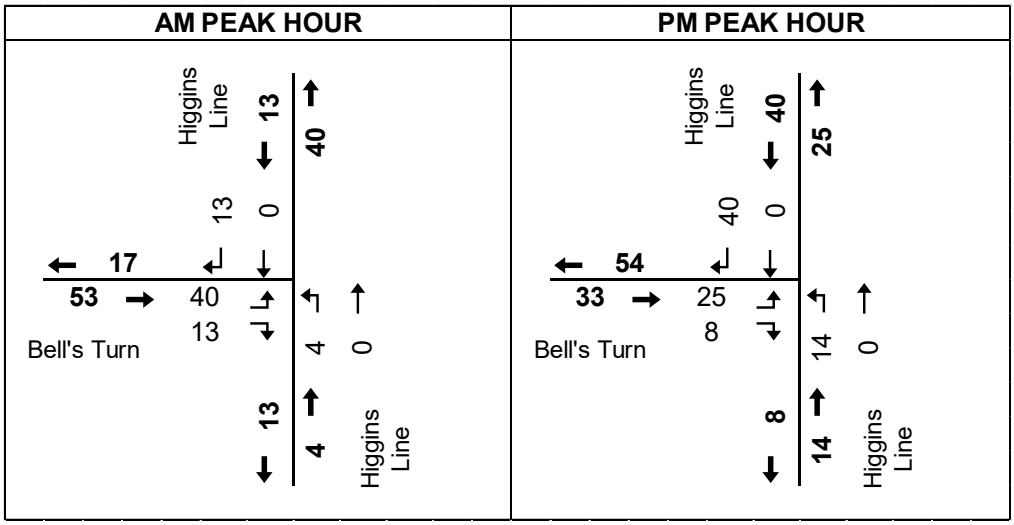


Figure 5: Site-Generated Traffic Volumes

5. TRAFFIC VOLUME FORECASTS

5.1. BACKGROUND GROWTH

A 5-year horizon (2030) was used for the traffic analysis to represent the full build-out of the proposed development. To develop traffic forecasts for the future horizon, turning movements at the intersection (based on the December count) were factored using a growth rate of 1.0 percent per year to reflect normal increases in background traffic in the study area. Figure 6 illustrates the future background traffic volumes for the weekday AM and PM peak hours.

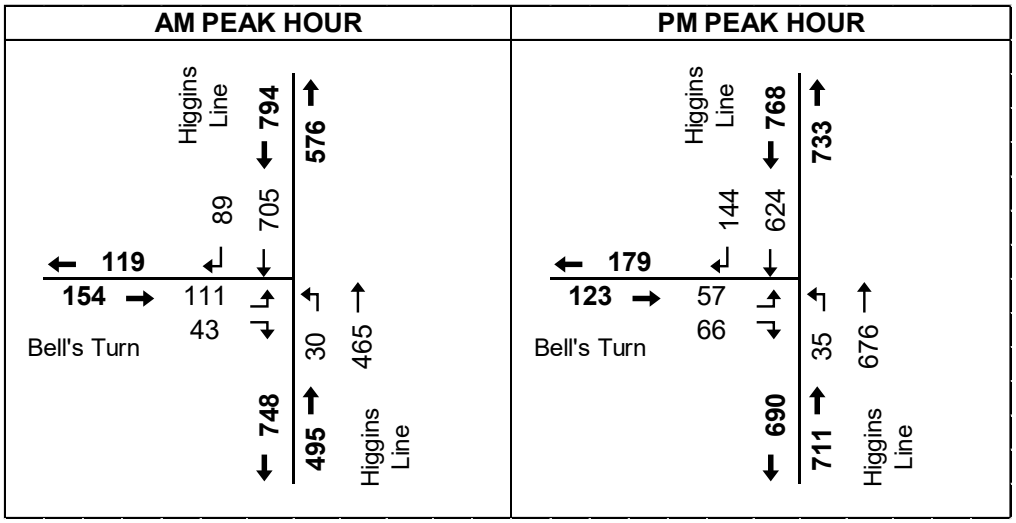


Figure 6: Future Background Traffic Volumes

5.2. FUTURE TOTAL TRAFFIC VOLUMES

The future total traffic volumes consist of the future background volumes with the addition of the trips generated by the proposed development. Figure 7 illustrates the future total traffic volumes for the weekday AM and PM peak hours.

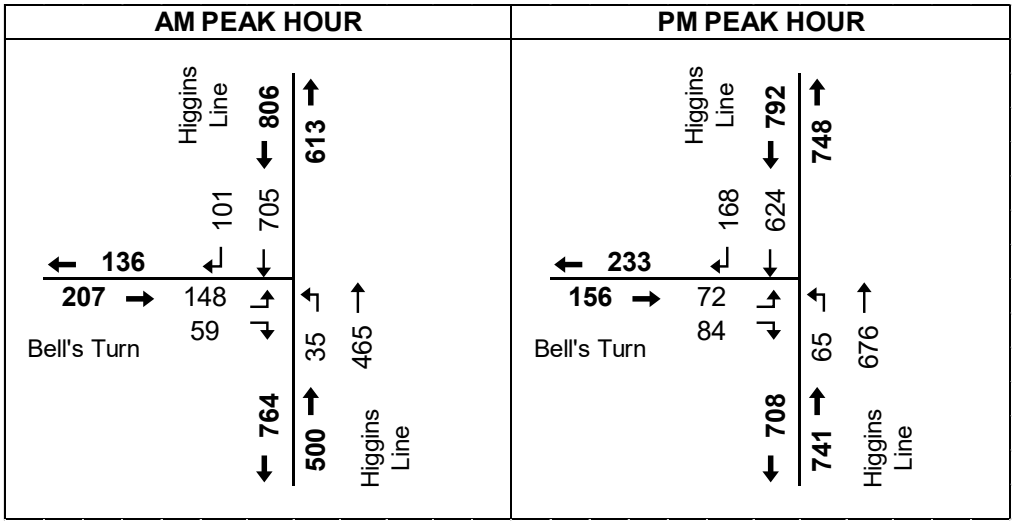


Figure 7: Future Total Traffic Volumes

6. TRAFFIC OPERATIONS ANALYSIS

6.1. METHODOLOGY

Synchro Studio (Version 12) was used to develop traffic models reflecting the existing weekday AM and PM peak hour conditions at the study intersection. Specific model input parameters included:

- Existing lane configuration,
- Heavy vehicle percentages, and
- Conflicting pedestrian volumes.

Synchro default values were used for all other inputs.

The models were used to assess traffic operations at the study area intersection, identify the need for any geometric or operational traffic control improvements to address any critical movements and to assess potential improvements. The following performance measures are reported:

- Delay and level of service (LOS) for each movement, approach and the overall intersection,
- volume-to-capacity ratio (v/c) for each movement, and
- 95th percentile queue lengths (using 7.6 m per vehicle) for each movement.

Reported results are based on the HCM analysis method. Each operational measure is compared to limits outlined in Table 4. Movements that are identified as “deficient” are considered critical in terms of operation and should be considered for geometric or other operational traffic control improvements.

Table 4: Intersection Performance Measures

Performance Measure	No Concern	Caution	Deficient
Level of Service (LOS)	LOS A to LOS D	LOS E	LOS F
Volume-to-capacity ratio (v/c)	<0.85	≥0.85 to <0.98	≥0.98
95th % Queue	<85% of storage	≥85% of storage	>storage

6.2. EXISTING OPERATIONS

Traffic operations at the study intersection were evaluated using the existing traffic volumes. Table 5 and Table 6 summarizes the results of the analysis for the AM and PM peak hours. **Appendix B** contains the supporting detailed Synchro reports. There are no existing performance concerns at the intersection of Higgins Line and Bell's Turn.

Table 5: Existing Operation, AM Peak Hour

Existing Conditions - AM Peak Hour												
Intersection	Control Type	Measure	Eastbound			Northbound			Southbound			Overall
			Left	Right	Approach	Left	Through	Approach	Through	Right	Approach	
1: Higgins Line & Bell's Turn	TWSC	Volume (vph)	106	41	**147**	29	442	**471**	671	85	**756**	**1374**
		Delay (s)	29.7	11.5	**24.6**	9.7	0.0	**0.6**	0.0	>	**0.0**	**2.8**
		LOS	D	B	**C**	A	A	**A**	A	>	**A**	**A**
		v/c	0.45	0.07		0.04	-		-	>		
		95th% Q (m)	16.7	1.5		0.8	-		-	>		
		Storage (m)	50.0	-		50.0	-		-	>		

Table 6: Existing Operation, PM Peak Hour

Existing Conditions - PM Peak Hour												
Intersection	Control Type	Measure	Eastbound			Northbound			Southbound			Overall
			Left	Right	Approach	Left	Through	Approach	Through	Right	Approach	
1: Higgins Line & Bell's Turn	TWSC	Volume (vph)	54	63	**117**	33	643	**676**	594	137	**731**	**1524**
		Delay (s)	25.3	11.5	**17.9**	9.7	0.0	**0.5**	0.0	>	**0.0**	**1.6**
		LOS	D	B	**C**	A	A	**A**	A	>	**A**	**A**
		v/c	0.25	0.11		0.04	-		-	>		
		95th% Q (m)	7.6	3.0		0.8	-		-	>		
		Storage (m)	50.0	-		50.0	-		-	>		

6.3. FUTURE BACKGROUND OPERATIONS

Traffic operations at the study intersection were evaluated using the 5-year horizon background traffic volumes with no development on the subject site. Existing intersection control and lane configurations were maintained. Table 7 and Table 8 summarize the results of the analysis for the AM and PM peak hours. **Appendix C** contains the supporting detailed Synchro reports.

The addition of the traffic generated by background growth is not expected to cause any significant performance concerns at the intersection of Higgins Line and Bell's Turn. Overall delay per vehicle on the stop-controlled approach (Bell's Turn) is expected to increase by approximately 3.3 seconds in the AM peak hour and 3.47 seconds in the PM peak hour.

Table 7: Future Background Operations, AM Peak Hour

Background Conditions - AM Peak Hour												
Intersection	Control Type	Measure	Eastbound			Northbound			Southbound			Overall
			Left	Right	Approach	Left	Through	Approach	Through	Right	Approach	
1: Higgins Line & Bell's Turn	TWSC	Volume (vph)	111	43	**154**	30	465	**495**	705	89	**794**	**1443**
		Delay (s)	34.1	11.7	**27.9**	9.9	0.0	**0.6**	0.0	>	**0.0**	**3.2**
		LOS	D	B	**D**	A	A	**A**	A	>	**A**	**A**
		v/c	0.50	0.08		0.04	-		-	>		
		95th% Q (m)	19.8	2.3		0.8	-		-	>		
		Storage (m)	50.0	-		50.0	-		-	>		

Table 8: Future Background Operations, PM Peak Hour

Background Conditions - PM Peak Hour												
Intersection	Control Type	Measure	Eastbound			Northbound			Southbound			Overall
			Left	Right	Approach	Left	Through	Approach	Through	Right	Approach	
1: Higgins Line & Bell's Turn	TWSC	Volume (vph)	57	66	**123**	35	676	**711**	624	144	**768**	**1602**
		Delay (s)	28.1	11.8	**21.4**	9.8	0.0	**0.5**	0.0	>	**0.0**	**1.7**
		LOS	D	B	**C**	A	A	**A**	A	>	**A**	**A**
		v/c	0.29	0.12		0.05	-		-	>		
		95th% Q (m)	8.4	3.0		1.5	-		-	>		
		Storage (m)	50.0	0.0		50.0	-		-	>		

6.4. FUTURE TOTAL OPERATIONS

Traffic operations at the study intersection were evaluated using the future total traffic volumes. Existing intersection control and lane configurations were maintained. Table 9 and Table 10 summarizes the results of the analysis for the AM and PM peak hours. **Appendix D** contains the supporting detailed Synchro reports.

With the addition of traffic generated by the development, the intersection of Higgins Line and Bell's Turn the eastbound left is expected to operate at a LOS of E in both the AM and PM peak hours. While the left movement is expected to experience longer delay, the v/c ratio for the movement will remain below capacity (v/c = 0.69 in the AM and 0.42 in the PM peak)

Overall delay per vehicle on the stop-controlled approach (Bell's Turn) is expected to increase by approximately 13.8 seconds in the AM peak hour and 5.9 seconds in the PM peak hour when compared to the existing condition.

Table 9: Total Traffic Operations, AM Peak Hour

Total Conditions - AM Peak Hour												
Intersection	Control Type	Measure	Eastbound			Northbound			Southbound			Overall
			Left	Right	Approach	Left	Through	Approach	Through	Right	Approach	
1: Higgins Line & Bell's Turn	TWSC	Volume (vph)	148	59	**207**	35	465	**500**	705	101	**806**	**1513**
		Delay (s)	48.9	12.0	**38.4**	10.0	0.0	**0.7**	0.0	>	**0.0**	**5.5**
		LOS	E	B	**E**	A	A	**A**	A	>	**A**	**A**
		v/c	0.69	0.11		0.05	-		-	>		
		95th% Q (m)	34.2	3.0		1.5	-		-	>		
		Storage (m)	50.0	-		50.0	-		-	>		

Table 10: Total Traffic Operations, PM Peak Hour

Total Conditions - PM Peak Hour												
Intersection	Control Type	Measure	Eastbound			Northbound			Southbound			Overall
			Left	Right	Approach	Left	Through	Approach	Through	Right	Approach	
1: Higgins Line & Bell's Turn	TWSC	Volume (vph)	72	84	**156**	65	676	**741**	624	168	**792**	**1689**
		Delay (s)	37.3	12.2	**23.8**	10.2	0.0	**0.9**	0.0	>	**0.0**	**2.6**
		LOS	E	B	**C**	B	A	**A**	A	>	**A**	**A**
		v/c	0.42	0.15		0.09	-		-	>		
		95th% Q (m)	14.4	3.8		2.3	-		-	>		
		Storage (m)	50.0	0.0		50.0	-		-	>		

7. COMPARISON OF MAY AND DECEMBER COUNTS

Turning movement counts were collected at the study intersection on Thursday, May 22nd, 2025 and December 2nd, 2025. Feedback from area residents, collected during the City's public consultation process, indicated that traffic volumes were probably lower at the time of the May 22nd, 2025 count as Memorial University and other post secondary institutions (e.g. College of the North Atlantic) had finished their winter semesters. A second turning movement count was subsequently collected on Tuesday, December 2nd, 2025.

For both counts, the AM peak hour occurred between 8:00 and 9:00 AM and the PM peak hour occurred between 4:15 and 5:15 PM. Volumes were indeed higher at the time of the December 2nd, 2025 count. There were 241 more vehicles in the AM peak, 85 more vehicles during the noon peak and 172 more vehicles in the PM peak. It was noted, interestingly, that the largest increases were Northbound on Higgins Line in the AM peak, and Southbound on Higgins Line in the PM peak, while the post secondary institutions on Ridge Road and Memorial University's Prince Philip Drive campus are located to the South.

In reviewing and comparing the two traffic counts, it was noted that the calculated peak hour factor (PHF) for individual movements varied widely, ranging from 0.57 to 0.99 in the May count and from 0.60 to 0.96 in the December count. During the AM peak for vehicles exiting Bell's Turn, for example, PHF for the left turn was calculated at 0.99 in the May count and 0.86 in the December count and, for the right turn, 0.78

in the May count and 0.60 in the December count. Also, because peak hour factors can fluctuate on any given day, calculated PHFs will not necessarily represent the future conditions for the intersection. The synchro default for PHF is 0.92. The Highway Capacity Manual indicates, for intersections with a total entering volume ≥1,000 veh/h, that 0.92 is a reasonable approximation for the peak-hour factor. It is further noted that the PHF for this intersection (which includes all approaches), averaged over the three recorded peak hours was 0.92 for the May Count and 0.91 for the December count.

To ensure the analysis of the May and December counts are comparable, the analysis based on the May count was completed again, using the default PHF of 0.92. The results of this analysis are included in **Appendix B, Appendix C** and **Appendix D** along with the analysis results based on the December counts as referenced in **Section 6.** Also included for comparison, in **Appendix E,** are Synchro results for the analysis comparing May and December counts using the calculated PHF by movement. In the interest of transparency, a summary of some results from each analysis are included in Table 11. Only the eastbound left turn movement from Bell's Turn to Higgins Line is shown in Table 11, level of service for all other movements was A or B in all analysis scenarios.

Table 11: Analysis Comparison – EB Left Turn

Left Turn from Bell's to Higgins	Based on May Count PHF = 0.92		Based On Dec Count PHF = 0.92		Based on May Count PHF by Movement		Based on Dec Count PHF by Movement	
	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
AM Existing	20.4	C	29.7	D	21.8	C	48.2	E
AM Background	22.2	C	34.1	D	23.9	C	61.0	F
AM Full Buildout	27.6	D	48.9	E	30.2	D	115.3	F
PM Existing	22.8	C	25.3	D	24.1	C	31.3	D
PM Background	25.3	D	28.1	D	27.0	D	36.0	E
PM Full Buildout	32.9	D	37.3	E	37.0	E	60.2	F

It is important to reiterate that the analysis results presented in Section 6 are for the December count data analysed using the Synchro default peak hour factor of 0.92. The information in Table 11 is provided for information / comparison purposes only. The peak hour factor compares traffic volume arriving during the busiest 15-minutes of the peak hour with the total volume arriving during the peak hour. It indicates how consistently traffic is arriving during the peak hour. A PHF of 1.0 indicates that the traffic volume in every 15-minute interval is the same throughout the hour. A lower PHF value indicates more variable traffic flows and a larger "spike" in the peak 15-minute interval. Lower volumes and less congestion typically result in a lower calculated PHF, while higher volumes and more congestion typically push the calculated PHF closer to 1.0. As indicated above, the PHF for the left turn exiting Bell's Turn during the AM peak hour was calculated at 0.99 in the May count and 0.86 in the December count. Also, as noted above, because peak hour factors can fluctuate on any given day - as evidenced here - the calculated PHFs will not accurately represent future conditions for the intersection. Furthermore, using the calculated PHF for each individual movement, assumes that the peak 15-minute period for each movement occurs simultaneously which, again, is demonstrably not the case. Applying the Synchro default PHF of 0.92 is, in our opinion, the 'fairest' way to compare the pre- and post-development scenarios. Area residents have expressed concerns indicating that they have experienced longer wait times than the analysis / modelling indicates. The highly variable nature of the PHFs observed in the May and December counts and the comparison of different analysis methods presented in Table 11 indicates that this could indeed, at times, be the case - however, it is not the 'normal' / standard condition.

8. TRAFFIC SIGNAL WARRANT

The TAC *Traffic Signal and Pedestrian Head Warrant Handbook*[5] provides guidance on the assessment of the need for traffic control signals at intersections. The procedure uses a "cumulative factors methodology" to identify if traffic control signals are warranted based on factors such as geometry, operating parameters, local demographics and pedestrian and vehicular volumes and conflicts. To warrant the installation of a traffic control signal, an intersection must score a minimum of 100 cumulative warrant points.

The traffic signal warrant analysis was completed for the intersection of Higgins Line and Bell's Turn using existing and future traffic volumes. A traffic signal is not warranted based on existing traffic volumes (54 points) and is not expected to be warranted based on the future total with the development (75 points). **Appendix F** contains the warrant analysis worksheets.

9. CONCLUSION AND RECOMMENDATIONS

It is important to reiterate here that the conclusions and recommendations which follow are based on the analysis presented in the report which, as discussed in Sections 6 and 7, was completed using a peak hour factor of 0.92.

9.1. CONCLUSIONS

Harbourside Transportation Consultants has completed a transportation impact study relating to the development application for a proposed residential development on Portugal Cove Place in St. Johns, NL. Based on the investigations carried out, it is concluded that:

- **Site-Generated Traffic**: The proposed development is expected to generate 70 new vehicle trips in the AM peak hour (17 trips entering, 53 trips exiting) and 87 vehicle trips in the PM peak hour (54 trips entering, 33 trips exiting). This analysis considers that all of the site generated traffic will be routed through the intersection of Higgins Line and Bell's Turn, a conservative approach as there is an alternate route available via Portugal Cove Place - Hunt's Lane – Gloucester Street – Ridge Road.
- **Access Sight Distance:** Sight lines at the southern site access on Portugal Cove Place are anticipated to be adequate. The northern site access is located off the proposed cul-de-sac bulb. Sight lines will only be required in one direction - south of the northern access (looking to the left). Without vehicles parked in the adjacent town house driveways, stopping sight distance is available. With parked vehicles the sight distance is reduced to approximately 45 metres. While the intersection sight distance will not meet the requirements for a speed of 50 km/h, speeds approaching the cul-de-sac can reasonably be assumed to be lower, and the volume of conflicting vehicles (i.e. vehicles continuing past the driveway to go around the cul-de-sac bulb) is anticipated to be very low. Given the location of this driveway, the speed reduction necessary for vehicles approaching the cul-de-sac bulb, and the anticipated very low volume of vehicles that would conflict with vehicles exiting the driveway, this is not a significant concern. A concealed intersection sign (WA-13R) could be considered but is not deemed necessary. General TAC guidance indicates that "concealed or unexpected intersection signs should not be used to warn of private driveways on entrances"

[5] *Traffic Signal and Pedestrian Head Warrant Handbook*, Transportation Association of Canada, June 2014.

- **Emergency Access Sight Distance:** The proposed emergency access on Portugal Cove Road will meet minimum stopping and turning sight distance requirements for both Portugal Cove Road and the TCH eastbound off ramp.
- **Pedestrian Access:** Portugal Cove Place will have adequate pedestrian connections with the newly constructed sidewalks in front of the proposed development.
- **Parking:** The site's proposed vehicle and bicycle parking supply will meet or exceed the City's minimum parking requirements.
- **Existing Operations:** The intersection of Higgins Line and Bell's Turn is stop-controlled and has separate left and right turn lanes for vehicles exiting Bell's Turn as well as a median left turn lane for vehicles turning left from Higgins Line.
- **5-year Background Operations:** The addition of background traffic growth is not expected to cause any significant operational deficiencies/concerns at the intersection.
- **5-year Total Operations:** The addition of site-generated traffic will result in the eastbound left turn (Bell's Turn) operating at LOS E during the AM and PM peak hours. Volumes for this movement are expected to remain below capacity.
- **Signal Warrant:** Traffic signals are not warranted at the intersection of Higgins Line and Bell's Turn based on existing and future traffic volumes.

9.2. RECOMMENDATIONS

The new vehicle trips associated with the proposed residential development can be accommodated at the intersection of Higgins Line and Bell's Turn with a minor impact on traffic operations – overall delay per vehicle on the stop-controlled approach (Bell's Turn) is expected to increase by 13.8 seconds in the AM peak hour and 5.9 seconds in the PM peak hour when compared to the exiting conditions. The left turn movement from Bell's Turn is expected to experience the longest increase in delay during the AM peak hour, increasing from 29.7 s (LOS D) to 48.9 s (LOS E), however the v/c ratio for this movement will remain below capacity (v/c = 0.69).

No improvements are proposed at the intersection of Higgins Line and Bell's Turn. As noted herein, to remain conservative the analysis considers that all the site generated traffic will be routed through the intersection of Higgins Line and Bell's Turn. An alternate route is available for drivers between the proposed development on Portugal Cove Place and Higgins Line via Hunt's Lane – Gloucester Street – Ridge Road. There is an existing traffic signal at the intersection of Higgins Line and Ridge Road. This is an available alternative for drivers that may be uncomfortable turning left at Bell's Turn.

APPENDIX A – Traffic Count Data

Harbourside Transportation Consultants
219 Waverley Road
Suite 200
Dartmouth, Nova Scotia, Canada B2X 2C3
(902) 405-4696 fallaire@harboursideengineering.ca

Count Name: Higgins Line & Bells Turn
Site Code:
Start Date: 05-22-2025

Turning Movement Data

Start Time	Bell's Turn Eastbound					Higgins Line Northbound					Higgins Line Southbound					
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Int. Total
6:30 AM	12	1	0	1	13	0	25	0	0	25	20	6	0	0	26	64
6:45 AM	12	3	0	0	15	2	25	0	0	27	34	8	0	2	42	84
Hourly Total	24	4	0	1	28	2	50	0	0	52	54	14	0	2	68	148
7:00 AM	10	1	0	0	11	1	30	0	0	31	51	12	0	0	63	105
7:15 AM	23	2	0	0	25	0	44	0	0	44	54	10	0	0	64	133
7:30 AM	12	4	0	0	16	1	51	0	1	52	105	10	0	1	115	183
7:45 AM	23	9	0	3	32	2	75	0	1	77	96	12	0	0	108	217
Hourly Total	68	16	0	3	84	4	200	0	2	204	306	44	0	1	350	638
8:00 AM	23	8	0	2	31	4	58	0	0	62	123	16	0	0	139	232
8:15 AM	22	9	0	0	31	7	107	0	0	114	154	33	0	0	187	332
8:30 AM	23	8	0	0	31	6	90	0	0	96	150	15	0	0	165	292
8:45 AM	23	3	0	0	26	3	78	0	0	81	146	24	0	0	170	277
Hourly Total	91	28	0	2	119	20	333	0	0	353	573	88	0	0	661	1133
9:00 AM	18	6	0	0	24	3	80	0	0	83	102	19	0	1	121	228
9:15 AM	16	0	0	0	16	3	76	0	0	79	65	19	0	0	84	179
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	34	6	0	0	40	6	156	0	0	162	167	38	0	1	205	407
12:00 PM	21	7	0	4	28	6	138	0	0	144	97	19	0	0	116	288
12:15 PM	25	3	0	1	28	4	111	0	0	115	99	23	0	0	122	265
12:30 PM	29	3	0	0	32	2	97	0	0	99	116	14	0	0	130	261
12:45 PM	21	3	0	0	24	5	126	0	0	131	119	14	0	0	133	288
Hourly Total	96	16	0	5	112	17	472	0	0	489	431	70	0	0	501	1102
1:00 PM	15	6	0	0	21	3	117	0	0	120	89	17	0	0	106	247
1:15 PM	19	4	0	2	23	4	90	0	0	94	123	19	0	0	142	259
1:30 PM	16	5	0	0	21	2	96	0	0	98	117	17	0	1	134	253
1:45 PM	20	2	0	1	22	4	88	0	0	92	108	20	0	0	128	242
Hourly Total	70	17	0	3	87	13	391	0	0	404	437	73	0	1	510	1001
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:30 PM	15	8	0	0	23	10	103	0	0	113	98	19	0	1	117	253
3:45 PM	21	11	0	0	32	6	130	0	0	136	79	19	0	1	98	266
Hourly Total	36	19	0	0	55	16	233	0	0	249	177	38	0	2	215	519
4:00 PM	20	7	0	2	27	8	140	0	1	148	95	32	0	0	127	302
4:15 PM	21	10	0	0	31	10	142	0	0	152	122	22	0	2	144	327
4:30 PM	25	15	0	0	40	8	151	0	0	159	118	35	0	2	153	352
4:45 PM	23	7	0	0	30	7	167	0	0	174	104	35	0	1	139	343
Hourly Total	89	39	0	2	128	33	600	0	1	633	439	124	0	5	563	1324

5:00 PM	28	12	0	0	40	7	147	0	0	154	104	32	0	0	136	330
5:15 PM	29	6	0	0	35	9	137	0	0	146	80	25	0	0	105	286
5:30 PM	28	7	0	4	35	8	98	0	0	106	98	34	0	0	132	273
5:45 PM	19	1	0	1	20	1	99	0	0	100	93	21	0	0	114	234
Hourly Total	104	26	0	5	130	25	481	0	0	506	375	112	0	0	487	1123
6:00 PM	21	2	0	1	23	6	83	0	0	89	90	24	0	0	114	226
6:15 PM	20	3	0	0	23	3	74	0	0	77	65	19	0	0	84	184
Grand Total	653	176	0	22	829	145	3073	0	3	3218	3114	644	0	12	3758	7805
Approach %	78.8	21.2	0.0	-	-	4.5	95.5	0.0	-	-	82.9	17.1	0.0	-	-	-
Total %	8.4	2.3	0.0	-	10.6	1.9	39.4	0.0	-	41.2	39.9	8.3	0.0	-	48.1	-
Lights	643	168	0	-	811	139	3028	0	-	3167	3049	619	0	-	3668	7646
% Lights	98.5	95.5	-	-	97.8	95.9	98.5	-	-	98.4	97.9	96.1	-	-	97.6	98.0
Mediums	10	8	0	-	18	6	43	0	-	49	63	25	0	-	88	155
% Mediums	1.5	4.5	-	-	2.2	4.1	1.4	-	-	1.5	2.0	3.9	-	-	2.3	2.0
Articulated Trucks	0	0	0	-	0	0	1	0	-	1	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	-	0	0	1	0	-	1	2	0	0	-	2	3
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.1	0.0	-	-	0.1	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	22	-	-	-	-	3	-	-	-	-	12	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

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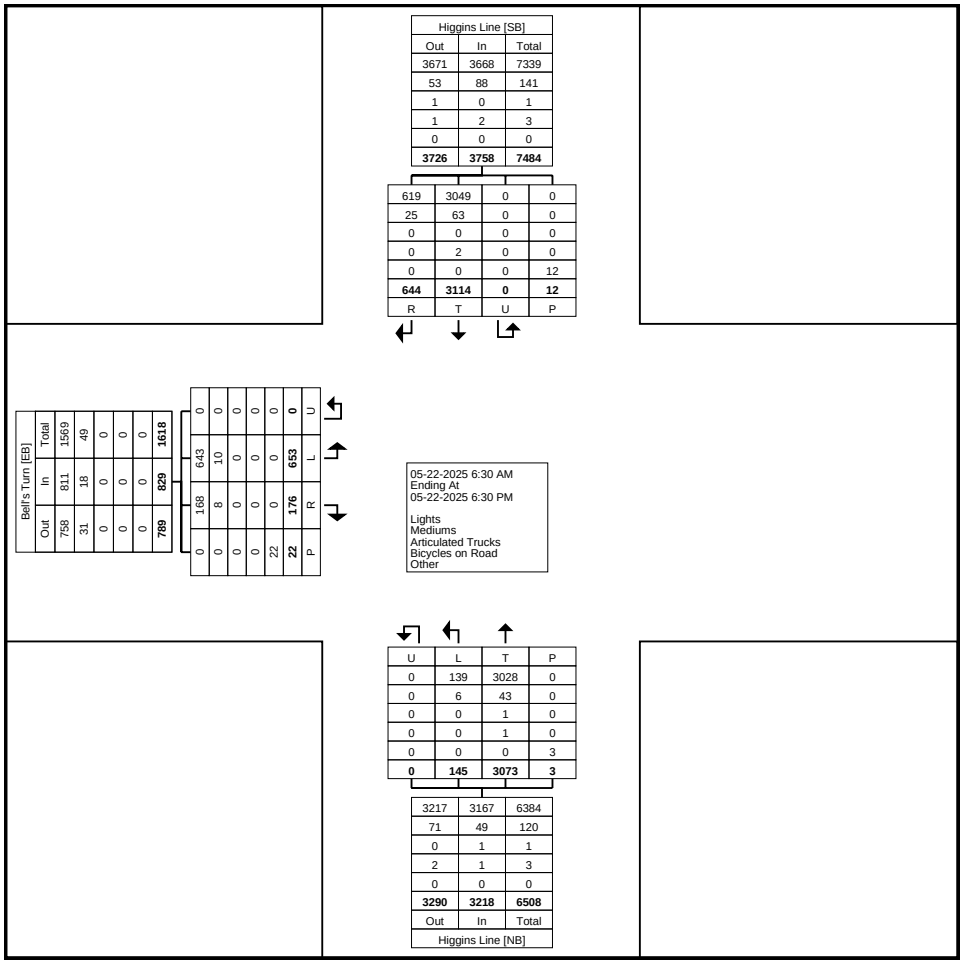
Count Name: Higgins Line & Bells Turn
Site Code:
Start Date: 05-22-2025



Turning Movement Data Plot

Harbourside Transportation Consultants
219 Waverley Road
Suite 200
Dartmouth, Nova Scotia, Canada B2X 2C3
(902) 405-4696 fallaire@harboursideengineering.ca

Count Name: Higgins Line & Bells Turn
Site Code:
Start Date: 05-22-2025

Turning Movement Peak Hour Data (8:00 AM)

Start Time	Bell's Turn Eastbound					Higgins Line Northbound					Higgins Line Southbound					
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Int. Total
8:00 AM	23	8	0	2	31	4	58	0	0	62	123	16	0	0	139	232
8:15 AM	22	9	0	0	31	7	107	0	0	114	154	33	0	0	187	332
8:30 AM	23	8	0	0	31	6	90	0	0	96	150	15	0	0	165	292
8:45 AM	23	3	0	0	26	3	78	0	0	81	146	24	0	0	170	277
Total	91	28	0	2	119	20	333	0	0	353	573	88	0	0	661	1133
Approach %	76.5	23.5	0.0	-	-	5.7	94.3	0.0	-	-	86.7	13.3	0.0	-	-	-
Total %	8.0	2.5	0.0	-	10.5	1.8	29.4	0.0	-	31.2	50.6	7.8	0.0	-	58.3	-
PHF	0.989	0.778	0.000	-	0.960	0.714	0.778	0.000	-	0.774	0.930	0.667	0.000	-	0.884	0.853
Lights	90	25	0	-	115	17	324	0	-	341	563	85	0	-	648	1104
% Lights	98.9	89.3	-	-	96.6	85.0	97.3	-	-	96.6	98.3	96.6	-	-	98.0	97.4
Mediums	1	3	0	-	4	3	9	0	-	12	10	3	0	-	13	29
% Mediums	1.1	10.7	-	-	3.4	15.0	2.7	-	-	3.4	1.7	3.4	-	-	2.0	2.6
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	2	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-

Harbourside Transportation Consultants
219 Waverley Road
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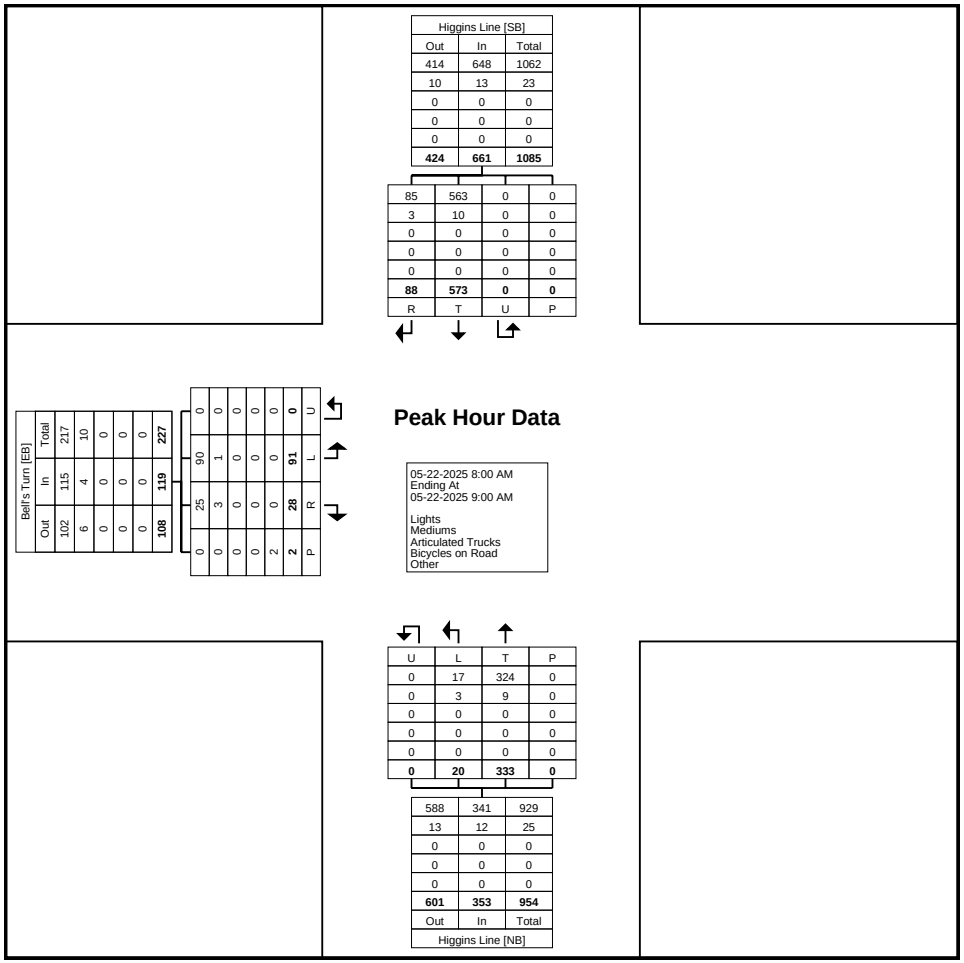
(902) 405-4696 fallaire@harboursideengineering.ca

Count Name: Higgins Line & Bells Turn
Site Code:
Start Date: 05-22-2025



Turning Movement Peak Hour Data Plot (8:00 AM)

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Count Name: Higgins Line & Bells Turn
Site Code:
Start Date: 05-22-2025

Turning Movement Peak Hour Data (12:00 PM)

Start Time	Bell's Turn Eastbound					Higgins Line Northbound					Higgins Line Southbound					
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Int. Total
12:00 PM	21	7	0	4	28	6	138	0	0	144	97	19	0	0	116	288
12:15 PM	25	3	0	1	28	4	111	0	0	115	99	23	0	0	122	265
12:30 PM	29	3	0	0	32	2	97	0	0	99	116	14	0	0	130	261
12:45 PM	21	3	0	0	24	5	126	0	0	131	119	14	0	0	133	288
Total	96	16	0	5	112	17	472	0	0	489	431	70	0	0	501	1102
Approach %	85.7	14.3	0.0	-	-	3.5	96.5	0.0	-	-	86.0	14.0	0.0	-	-	-
Total %	8.7	1.5	0.0	-	10.2	1.5	42.8	0.0	-	44.4	39.1	6.4	0.0	-	45.5	-
PHF	0.828	0.571	0.000	-	0.875	0.708	0.855	0.000	-	0.849	0.905	0.761	0.000	-	0.942	0.957
Lights	96	16	0	-	112	16	465	0	-	481	422	67	0	-	489	1082
% Lights	100.0	100.0	-	-	100.0	94.1	98.5	-	-	98.4	97.9	95.7	-	-	97.6	98.2
Mediums	0	0	0	-	0	1	7	0	-	8	9	3	0	-	12	20
% Mediums	0.0	0.0	-	-	0.0	5.9	1.5	-	-	1.6	2.1	4.3	-	-	2.4	1.8
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	5	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-

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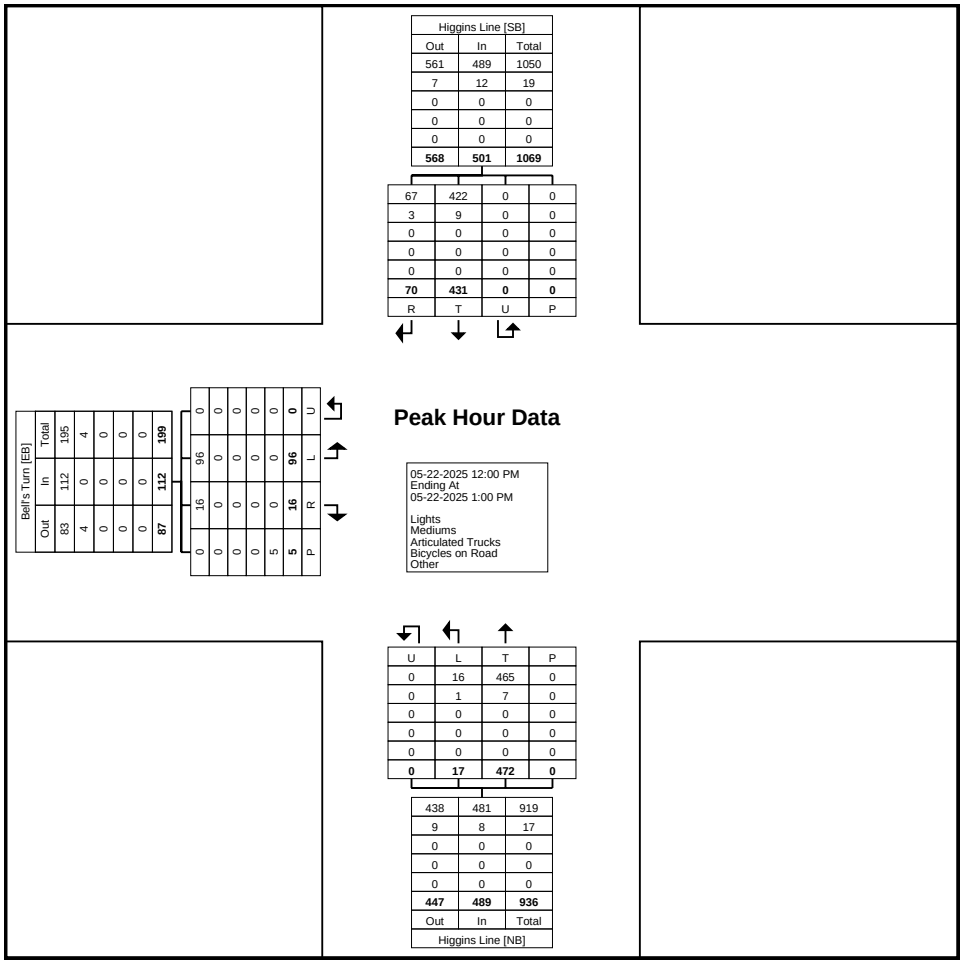

Turning Movement Peak Hour Data Plot (12:00 PM)

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Count Name: Higgins Line & Bells Turn
Site Code:
Start Date: 05-22-2025

Turning Movement Peak Hour Data (4:15 PM)

Start Time	Bell's Turn Eastbound					Higgins Line Northbound					Higgins Line Southbound					
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Int. Total
4:15 PM	21	10	0	0	31	10	142	0	0	152	122	22	0	2	144	327
4:30 PM	25	15	0	0	40	8	151	0	0	159	118	35	0	2	153	352
4:45 PM	23	7	0	0	30	7	167	0	0	174	104	35	0	1	139	343
5:00 PM	28	12	0	0	40	7	147	0	0	154	104	32	0	0	136	330
Total	97	44	0	0	141	32	607	0	0	639	448	124	0	5	572	1352
Approach %	68.8	31.2	0.0	-	-	5.0	95.0	0.0	-	-	78.3	21.7	0.0	-	-	-
Total %	7.2	3.3	0.0	-	10.4	2.4	44.9	0.0	-	47.3	33.1	9.2	0.0	-	42.3	-
PHF	0.866	0.733	0.000	-	0.881	0.800	0.909	0.000	-	0.918	0.918	0.886	0.000	-	0.935	0.960
Lights	95	44	0	-	139	31	601	0	-	632	440	121	0	-	561	1332
% Lights	97.9	100.0	-	-	98.6	96.9	99.0	-	-	98.9	98.2	97.6	-	-	98.1	98.5
Mediums	2	0	0	-	2	1	5	0	-	6	8	3	0	-	11	19
% Mediums	2.1	0.0	-	-	1.4	3.1	0.8	-	-	0.9	1.8	2.4	-	-	1.9	1.4
Articulated Trucks	0	0	0	-	0	0	1	0	-	1	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.2	-	-	0.2	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	5	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

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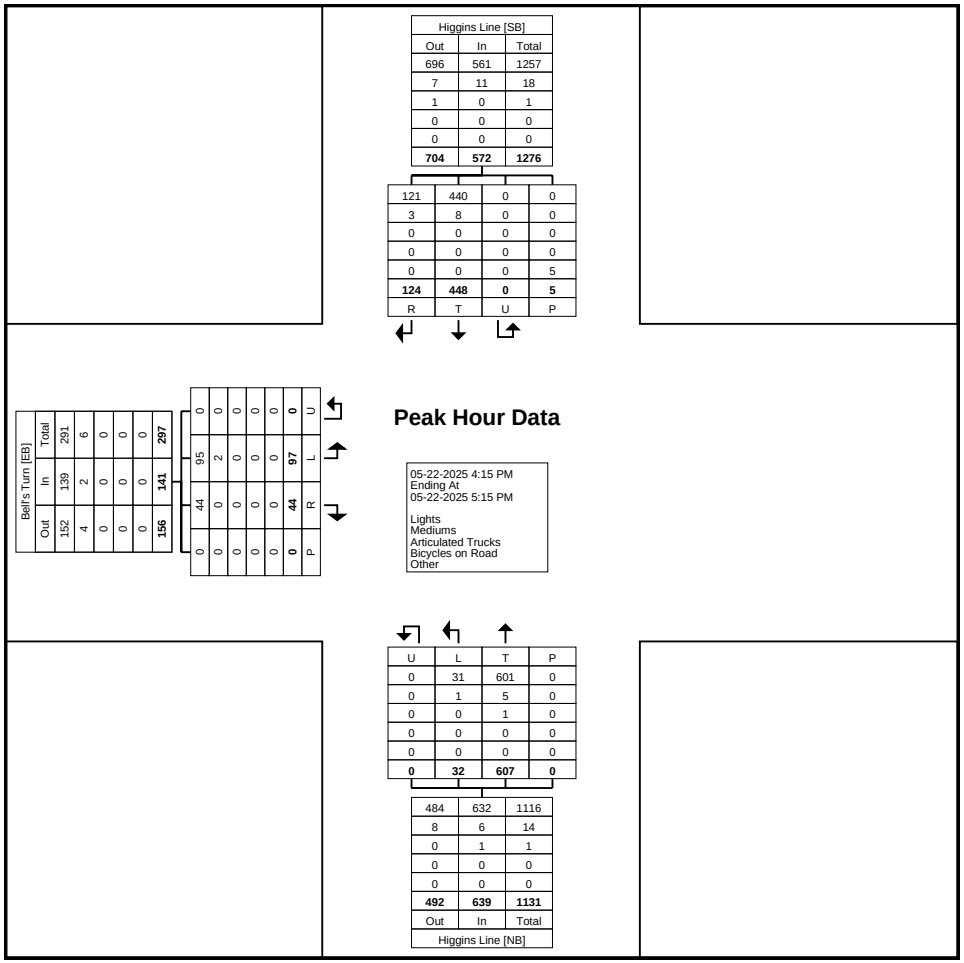
Site Code:
Start Date: 05-22-2025



Turning Movement Peak Hour Data Plot (4:15 PM)

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Suite 200
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(902) 405-4696 ahennessey@harboursideengineering.ca

Count Name: Higgins Line & Bells Turn
Site Code:
Start Date: 12/02/2025

Turning Movement Data

Start Time	Bells Turn Eastbound					Higgins Line Northbound					Higgins Line Southbound					
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Int. Total
6:30 AM	11	2	0	0	13	0	28	0	0	28	18	7	0	0	25	66
6:45 AM	10	4	0	0	14	0	24	0	0	24	51	7	0	0	58	96
Hourly Total	21	6	0	0	27	0	52	0	0	52	69	14	0	0	83	162
7:00 AM	5	2	0	0	7	1	35	0	0	36	41	7	0	0	48	91
7:15 AM	9	2	0	0	11	1	45	0	0	46	63	9	0	1	72	129
7:30 AM	18	7	0	0	25	0	66	0	0	66	86	10	0	0	96	187
7:45 AM	23	4	0	1	27	4	85	0	0	89	128	12	0	0	140	256
Hourly Total	55	15	0	1	70	6	231	0	0	237	318	38	0	1	356	663
8:00 AM	31	4	0	1	35	4	99	0	0	103	142	18	0	0	160	298
8:15 AM	24	11	0	1	35	6	119	0	0	125	165	22	0	0	187	347
8:30 AM	21	17	0	0	38	11	113	0	0	124	222	25	0	0	247	409
8:45 AM	30	9	0	0	39	8	111	0	0	119	142	20	0	1	162	320
Hourly Total	106	41	0	2	147	29	442	0	0	471	671	85	0	1	756	1374
9:00 AM	19	3	0	3	22	5	91	0	0	96	108	22	0	1	130	248
9:15 AM	16	2	0	0	18	3	81	0	0	84	92	18	0	0	110	212
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hourly Total	35	5	0	3	40	8	172	0	0	180	200	40	0	1	240	460
12:00 PM	20	9	0	1	29	2	141	0	0	143	95	26	0	1	121	293
12:15 PM	21	7	0	3	28	5	130	0	0	135	117	24	0	0	141	304
12:30 PM	20	7	0	0	27	4	105	0	0	109	118	26	0	0	144	280
12:45 PM	15	8	0	1	23	11	113	0	0	124	122	21	0	1	143	290
Hourly Total	76	31	0	5	107	22	489	0	0	511	452	97	0	2	549	1167
1:00 PM	26	18	0	0	44	8	109	0	0	117	119	18	0	0	137	298
1:15 PM	20	6	0	0	26	9	108	0	0	117	126	27	0	2	153	296
1:30 PM	14	14	0	0	28	3	116	0	0	119	135	21	0	1	156	303
1:45 PM	18	3	0	0	21	8	104	0	0	112	106	16	0	0	122	255
Hourly Total	78	41	0	0	119	28	437	0	0	465	486	82	0	3	568	1152
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:30 PM	21	7	0	1	28	6	148	0	1	154	103	21	0	0	124	306
3:45 PM	21	9	0	0	30	11	114	0	0	125	107	37	0	0	144	299
Hourly Total	42	16	0	1	58	17	262	0	1	279	210	58	0	0	268	605
4:00 PM	28	14	0	1	42	9	165	0	0	174	117	26	0	0	143	359
4:15 PM	17	11	0	1	28	5	139	0	1	144	102	33	0	0	135	307
4:30 PM	17	19	0	0	36	10	164	0	0	174	178	31	0	0	209	419
4:45 PM	10	19	0	2	29	5	170	0	0	175	174	38	0	0	212	416
Hourly Total	72	63	0	4	135	29	638	0	1	667	571	128	0	0	699	1501

5:00 PM	10	14	0	2	24	13	170	0	1	183	140	35	0	2	175	382
5:15 PM	16	13	0	2	29	5	134	0	0	139	97	32	0	0	129	297
5:30 PM	23	7	0	1	30	4	93	0	2	97	101	33	0	2	134	261
5:45 PM	21	5	0	1	26	3	102	0	0	105	107	20	0	2	127	258
Hourly Total	70	39	0	6	109	25	499	0	3	524	445	120	0	6	565	1198
6:00 PM	17	6	0	5	23	2	82	0	1	84	94	28	0	1	122	229
6:15 PM	22	7	0	0	29	4	83	0	0	87	78	25	0	1	103	219
Grand Total	594	270	0	27	864	170	3387	0	6	3557	3594	715	0	16	4309	8730
Approach %	68.8	31.3	0.0	-	-	4.8	95.2	0.0	-	-	83.4	16.6	0.0	-	-	-
Total %	6.8	3.1	0.0	-	9.9	1.9	38.8	0.0	-	40.7	41.2	8.2	0.0	-	49.4	-
Lights	587	260	0	-	847	164	3346	0	-	3510	3521	684	0	-	4205	8562
% Lights	98.8	96.3	-	-	98.0	96.5	98.8	-	-	98.7	98.0	95.7	-	-	97.6	98.1
Mediums	6	10	0	-	16	5	41	0	-	46	71	30	0	-	101	163
% Mediums	1.0	3.7	-	-	1.9	2.9	1.2	-	-	1.3	2.0	4.2	-	-	2.3	1.9
Articulated Trucks	1	0	0	-	1	1	0	0	-	1	1	0	0	-	1	3
% Articulated Trucks	0.2	0.0	-	-	0.1	0.6	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	1	1	0	-	2	2
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.1	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	27	-	-	-	-	6	-	-	-	-	16	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

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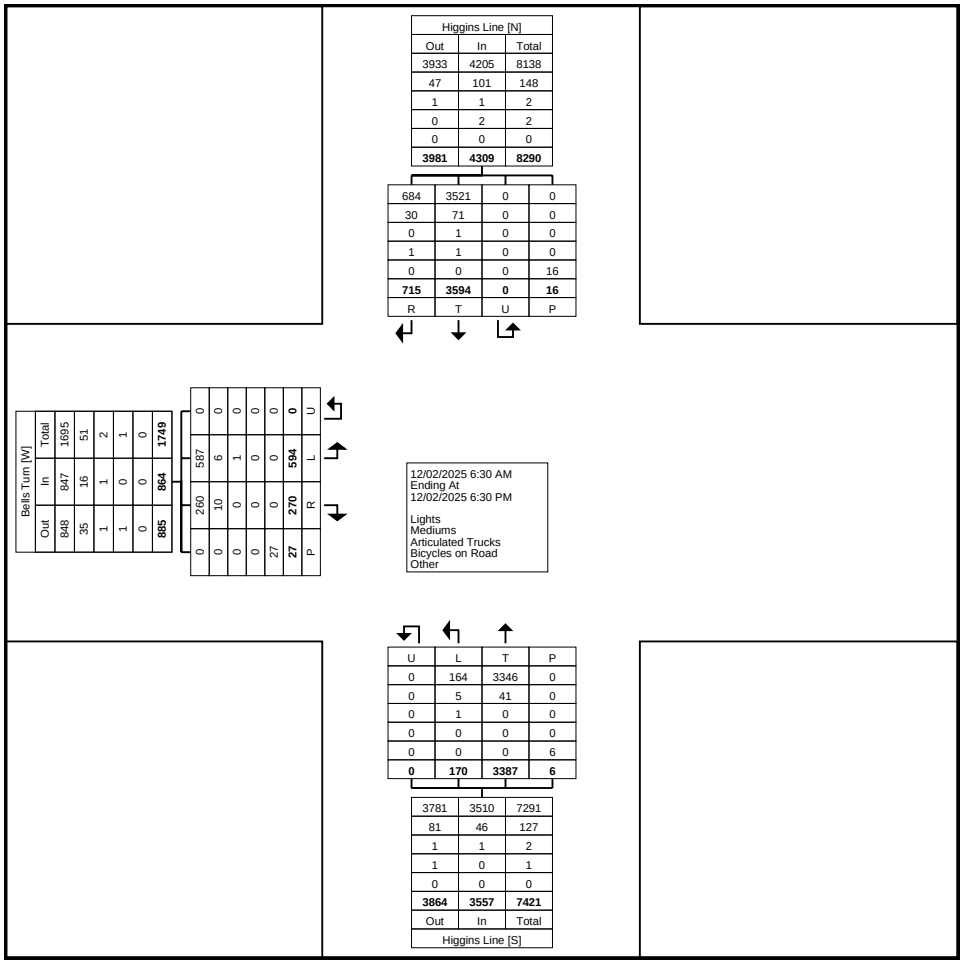
Start Date: 12/02/2025



Turning Movement Data Plot

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Count Name: Higgins Line & Bells Turn
Site Code:
Start Date: 12/02/2025

Turning Movement Peak Hour Data (8:00 AM)

Start Time	Bells Turn Eastbound					Higgins Line Northbound					Higgins Line Southbound					
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Int. Total
8:00 AM	31	4	0	1	35	4	99	0	0	103	142	18	0	0	160	298
8:15 AM	24	11	0	1	35	6	119	0	0	125	165	22	0	0	187	347
8:30 AM	21	17	0	0	38	11	113	0	0	124	222	25	0	0	247	409
8:45 AM	30	9	0	0	39	8	111	0	0	119	142	20	0	1	162	320
Total	106	41	0	2	147	29	442	0	0	471	671	85	0	1	756	1374
Approach %	72.1	27.9	0.0	-	-	6.2	93.8	0.0	-	-	88.8	11.2	0.0	-	-	-
Total %	7.7	3.0	0.0	-	10.7	2.1	32.2	0.0	-	34.3	48.8	6.2	0.0	-	55.0	-
PHF	0.855	0.603	0.000	-	0.942	0.659	0.929	0.000	-	0.942	0.756	0.850	0.000	-	0.765	0.840
Lights	105	38	0	-	143	28	430	0	-	458	657	81	0	-	738	1339
% Lights	99.1	92.7	-	-	97.3	96.6	97.3	-	-	97.2	97.9	95.3	-	-	97.6	97.5
Mediums	1	3	0	-	4	1	12	0	-	13	14	4	0	-	18	35
% Mediums	0.9	7.3	-	-	2.7	3.4	2.7	-	-	2.8	2.1	4.7	-	-	2.4	2.5
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	2	-	-	-	-	0	-	-	-	-	1	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-

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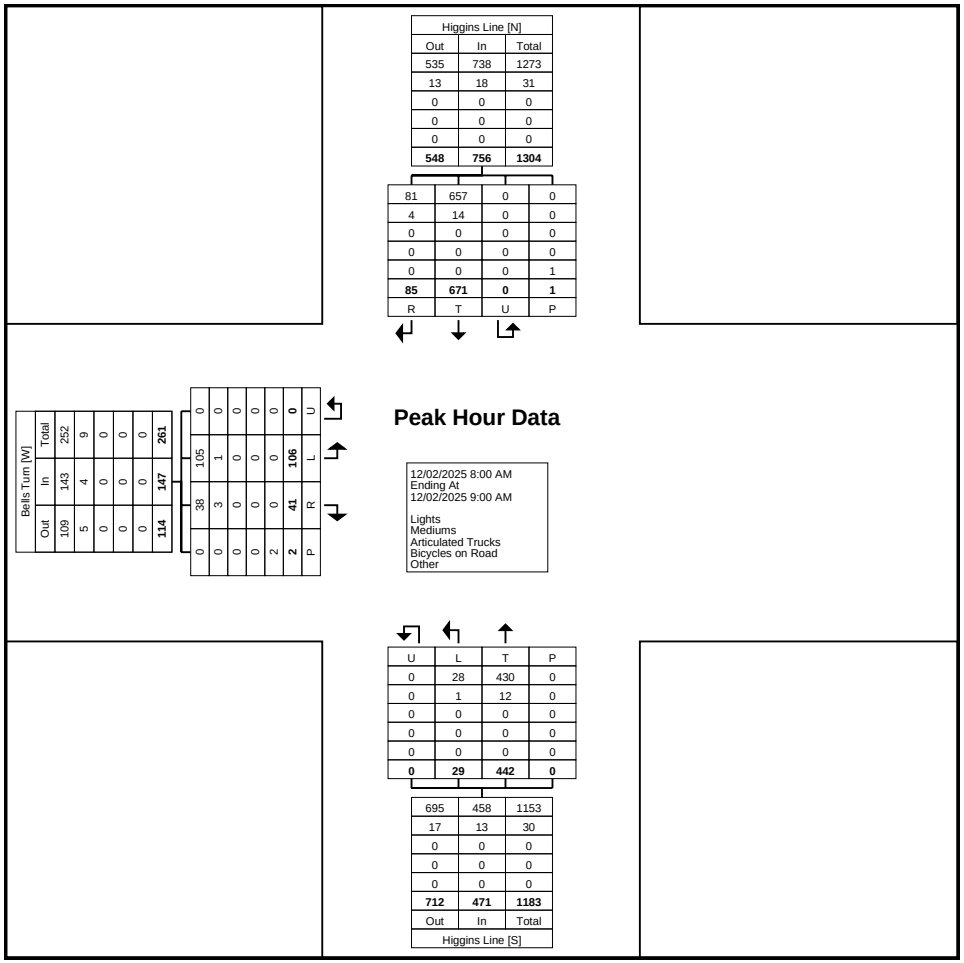

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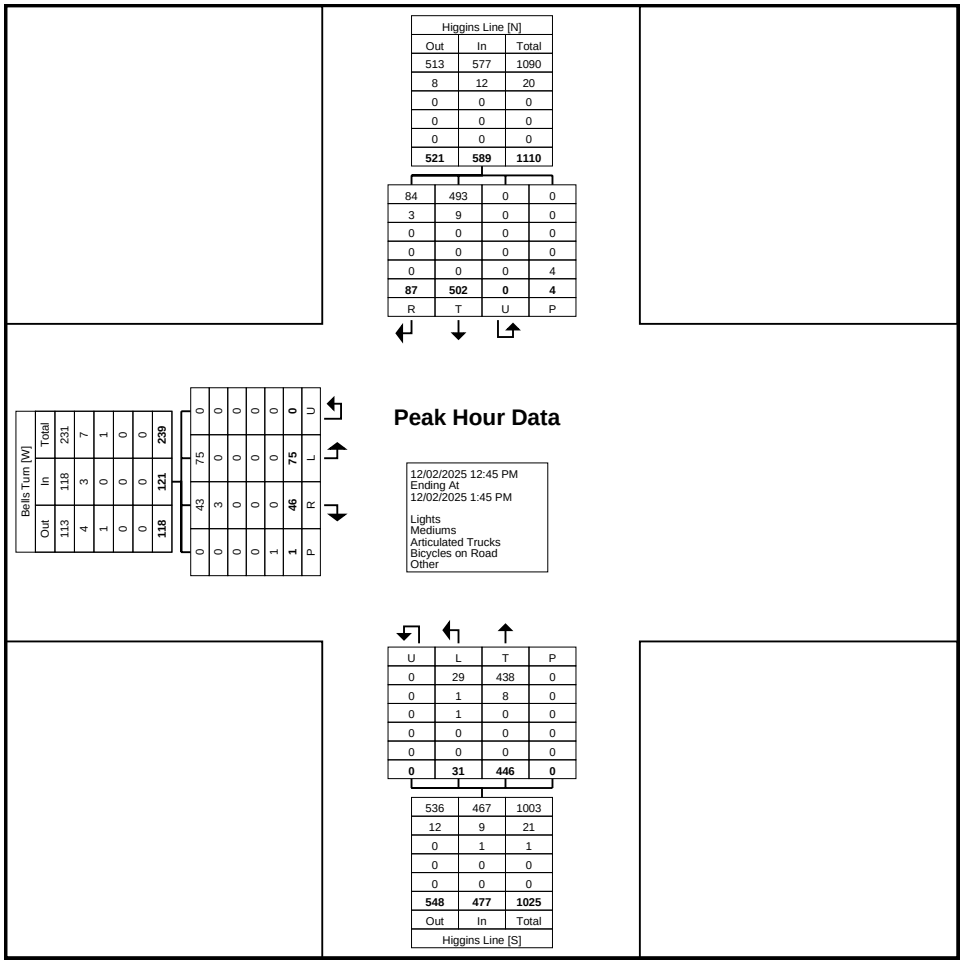
Count Name: Higgins Line & Bells Turn
Site Code:
Start Date: 12/02/2025

Turning Movement Peak Hour Data (12:45 PM)

Start Time	Bells Turn Eastbound					Higgins Line Northbound					Higgins Line Southbound					
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Int. Total
12:45 PM	15	8	0	1	23	11	113	0	0	124	122	21	0	1	143	290
1:00 PM	26	18	0	0	44	8	109	0	0	117	119	18	0	0	137	298
1:15 PM	20	6	0	0	26	9	108	0	0	117	126	27	0	2	153	296
1:30 PM	14	14	0	0	28	3	116	0	0	119	135	21	0	1	156	303
Total	75	46	0	1	121	31	446	0	0	477	502	87	0	4	589	1187
Approach %	62.0	38.0	0.0	-	-	6.5	93.5	0.0	-	-	85.2	14.8	0.0	-	-	-
Total %	6.3	3.9	0.0	-	10.2	2.6	37.6	0.0	-	40.2	42.3	7.3	0.0	-	49.6	-
PHF	0.721	0.639	0.000	-	0.688	0.705	0.961	0.000	-	0.962	0.930	0.806	0.000	-	0.944	0.979
Lights	75	43	0	-	118	29	438	0	-	467	493	84	0	-	577	1162
% Lights	100.0	93.5	-	-	97.5	93.5	98.2	-	-	97.9	98.2	96.6	-	-	98.0	97.9
Mediums	0	3	0	-	3	1	8	0	-	9	9	3	0	-	12	24
% Mediums	0.0	6.5	-	-	2.5	3.2	1.8	-	-	1.9	1.8	3.4	-	-	2.0	2.0
Articulated Trucks	0	0	0	-	0	1	0	0	-	1	0	0	0	-	0	1
% Articulated Trucks	0.0	0.0	-	-	0.0	3.2	0.0	-	-	0.2	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	1	-	-	-	-	0	-	-	-	-	4	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-

Harbourside Transportation Consultants
219 Waverley Road
Suite 200
Dartmouth, Nova Scotia, Canada B2X 2C3
(902) 405-4696 ahennessey@harboursideengineering.ca

Count Name: Higgins Line & Bells Turn
Site Code:
Start Date: 12/02/2025



Turning Movement Peak Hour Data Plot (12:45 PM)

Harbourside Transportation Consultants
219 Waverley Road
Suite 200
Dartmouth, Nova Scotia, Canada B2X 2C3
(902) 405-4696 ahennessey@harboursideengineering.ca

Count Name: Higgins Line & Bells Turn
Site Code:
Start Date: 12/02/2025

Turning Movement Peak Hour Data (4:15 PM)

Start Time	Bells Turn Eastbound					Higgins Line Northbound					Higgins Line Southbound					
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Int. Total
4:15 PM	17	11	0	1	28	5	139	0	1	144	102	33	0	0	135	307
4:30 PM	17	19	0	0	36	10	164	0	0	174	178	31	0	0	209	419
4:45 PM	10	19	0	2	29	5	170	0	0	175	174	38	0	0	212	416
5:00 PM	10	14	0	2	24	13	170	0	1	183	140	35	0	2	175	382
Total	54	63	0	5	117	33	643	0	2	676	594	137	0	2	731	1524
Approach %	46.2	53.8	0.0	-	-	4.9	95.1	0.0	-	-	81.3	18.7	0.0	-	-	-
Total %	3.5	4.1	0.0	-	7.7	2.2	42.2	0.0	-	44.4	39.0	9.0	0.0	-	48.0	-
PHF	0.794	0.829	0.000	-	0.813	0.635	0.946	0.000	-	0.923	0.834	0.901	0.000	-	0.862	0.909
Lights	54	62	0	-	116	32	638	0	-	670	579	133	0	-	712	1498
% Lights	100.0	98.4	-	-	99.1	97.0	99.2	-	-	99.1	97.5	97.1	-	-	97.4	98.3
Mediums	0	1	0	-	1	1	5	0	-	6	15	4	0	-	19	26
% Mediums	0.0	1.6	-	-	0.9	3.0	0.8	-	-	0.9	2.5	2.9	-	-	2.6	1.7
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	5	-	-	-	-	2	-	-	-	-	2	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	-	-	-	100.0	-	-

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Count Name: Higgins Line & Bells Turn
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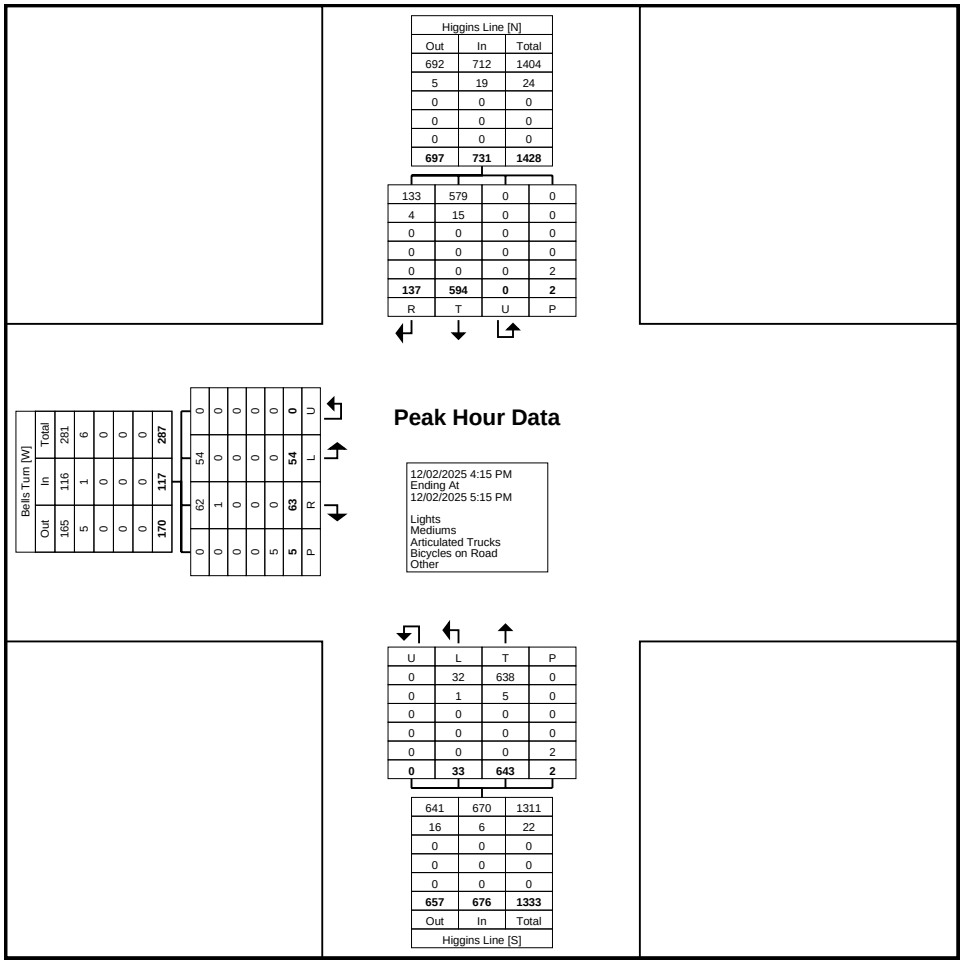


Turning Movement Peak Hour Data Plot (4:15 PM)

APPENDIX B – Existing Operations Synchro Reports

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	106	41	29	442	671	85
Future Vol, veh/h	106	41	29	442	671	85
Conflicting Peds, #/hr	1	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-4	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	7	3	3	2	5
Mvmt Flow	115	45	32	480	729	92

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1082	413	824	0	-	0
Stage 1	778	-	-	-	-	
Stage 2	304	-	-	-	-	-
Critical Hdwy	6.04	6.64	4.16	-	-	-
Critical Hdwy Stg 1	5.04	-	-	-	-	-
Critical Hdwy Stg 2	5.04	-	-	-	-	
Follow-up Hdwy	3.52	3.37	2.23	-	-	-
Pot Cap-1 Maneuver	270	601	796	-	-	-
Stage 1	492	-	-	-	-	-
Stage 2	772	-	-	-	-	
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	258	600	794	-	-	-
Mov Cap-2 Maneuver	258	-	-	-	-	-
Stage 1	471	-	-	-	-	
Stage 2	771	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	24.61	0.6	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	794	-	258	600	-	-
HCM Lane V/C Ratio	0.04	-	0.446	0.074	-	-
HCM Ctrl Dly (s/v)	9.7	-	29.7	11.5	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	2.2	0.2	-	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	54	63	33	643	594	137
Future Vol, veh/h	54	63	33	643	594	137
Conflicting Peds, #/hr	2	2	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-4	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	3	2	3	3
Mvmt Flow	59	68	36	699	646	149

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1148	404	800	0	-	0
Stage 1	725	-	-	-	-	
Stage 2	423	-	-	-	-	-
Critical Hdwy	6.04	6.54	4.16	-	-	-
Critical Hdwy Stg 1	5.04	-	-	-	-	-
Critical Hdwy Stg 2	5.04	-	-	-	-	
Follow-up Hdwy	3.52	3.32	2.23	-	-	-
Pot Cap-1 Maneuver	248	623	813	-	-	-
Stage 1	517	-	-	-	-	-
Stage 2	691	-	-	-	-	
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	235	619	808	-	-	-
Mov Cap-2 Maneuver	235	-	-	-	-	-
Stage 1	492	-	-	-	-	
Stage 2	689	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	17.9	0.47	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	808	-	235	619	-	-
HCM Lane V/C Ratio	0.044	-	0.25	0.111	-	-
HCM Ctrl Dly (s/v)	9.7	-	25.3	11.5	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	1	0.4	-	-

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	91	28	20	333	573	88
Future Vol, veh/h	91	28	20	333	573	88
Conflicting Peds, #/hr	0	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-4	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	11	15	3	2	3
Mvmt Flow	99	30	22	362	623	96

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	897	361	720	0	-	0
Stage 1	673	-	-	-	-	
Stage 2	224	-	-	-	-	-
Critical Hdwy	6.04	6.72	4.4	-	-	-
Critical Hdwy Stg 1	5.04	-	-	-	-	-
Critical Hdwy Stg 2	5.04	-	-	-	-	
Follow-up Hdwy	3.52	3.41	2.35	-	-	-
Pot Cap-1 Maneuver	341	635	796	-	-	-
Stage 1	544	-	-	-	-	-
Stage 2	832	-	-	-	-	
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	331	634	794	-	-	-
Mov Cap-2 Maneuver	331	-	-	-	-	-
Stage 1	528	-	-	-	-	
Stage 2	832	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	18.22	0.55	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	794	-	331	634	-	-
HCM Lane V/C Ratio	0.027	-	0.299	0.048	-	-
HCM Ctrl Dly (s/v)	9.7	-	20.4	11	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	1.2	0.2	-	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	97	44	32	607	448	124
Future Vol, veh/h	97	44	32	607	448	124
Conflicting Peds, #/hr	0	5	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-4	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	105	48	35	660	487	135

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	954	316	622	0	-	0
Stage 1	554	-	-	-	-	
Stage 2	399	-	-	-	-	-
Critical Hdwy	6.04	6.54	4.16	-	-	-
Critical Hdwy Stg 1	5.04	-	-	-	-	-
Critical Hdwy Stg 2	5.04	-	-	-	-	
Follow-up Hdwy	3.52	3.32	2.23	-	-	-
Pot Cap-1 Maneuver	317	704	948	-	-	-
Stage 1	610	-	-	-	-	-
Stage 2	706	-	-	-	-	
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	306	701	948	-	-	-
Mov Cap-2 Maneuver	306	-	-	-	-	-
Stage 1	587	-	-	-	-	
Stage 2	706	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	19	0.45	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	948	-	306	701	-	-
HCM Lane V/C Ratio	0.037	-	0.345	0.068	-	-
HCM Ctrl Dly (s/v)	8.9	-	22.8	10.5	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	1.5	0.2	-	-

APPENDIX C – Future Background Operations Synchro Reports

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	111	43	30	465	705	89
Future Vol, veh/h	111	43	30	465	705	89
Conflicting Peds, #/hr	1	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-4	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	7	3	3	2	5
Mvmt Flow	121	47	33	505	766	97

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1136	434	865	0	-	0
Stage 1	817	-	-	-	-	
Stage 2	319	-	-	-	-	-
Critical Hdwy	6.04	6.64	4.16	-	-	-
Critical Hdwy Stg 1	5.04	-	-	-	-	-
Critical Hdwy Stg 2	5.04	-	-	-	-	
Follow-up Hdwy	3.52	3.37	2.23	-	-	-
Pot Cap-1 Maneuver	252	584	767	-	-	-
Stage 1	473	-	-	-	-	-
Stage 2	762	-	-	-	-	
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	240	583	766	-	-	-
Mov Cap-2 Maneuver	240	-	-	-	-	-
Stage 1	452	-	-	-	-	
Stage 2	761	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	27.88	0.6	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	766	-	240	583	-	-
HCM Lane V/C Ratio	0.043	-	0.502	0.08	-	-
HCM Ctrl Dly (s/v)	9.9	-	34.1	11.7	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	2.6	0.3	-	-

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	57	66	35	676	624	144
Future Vol, veh/h	57	66	35	676	624	144
Conflicting Peds, #/hr	2	2	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-4	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	3	2	3	3
Mvmt Flow	62	72	38	735	678	157

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1207	424	840	0	-	0
Stage 1	762	-	-	-	-	
Stage 2	445	-	-	-	-	-
Critical Hdwy	6.04	6.54	4.16	-	-	-
Critical Hdwy Stg 1	5.04	-	-	-	-	-
Critical Hdwy Stg 2	5.04	-	-	-	-	
Follow-up Hdwy	3.52	3.32	2.23	-	-	-
Pot Cap-1 Maneuver	230	606	785	-	-	-
Stage 1	499	-	-	-	-	-
Stage 2	676	-	-	-	-	
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	217	602	781	-	-	-
Mov Cap-2 Maneuver	217	-	-	-	-	-
Stage 1	473	-	-	-	-	
Stage 2	675	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	19.33	0.48	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	781	-	217	602	-	-
HCM Lane V/C Ratio	0.049	-	0.285	0.119	-	-
HCM Ctrl Dly (s/v)	9.8	-	28.1	11.8	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1.1	0.4	-	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	96	29	21	350	602	92
Future Vol, veh/h	96	29	21	350	602	92
Conflicting Peds, #/hr	0	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-4	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	11	15	3	2	3
Mvmt Flow	104	32	23	380	654	100

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	942	379	756	0	-	0
Stage 1	706	-	-	-	-	
Stage 2	236	-	-	-	-	-
Critical Hdwy	6.04	6.72	4.4	-	-	-
Critical Hdwy Stg 1	5.04	-	-	-	-	-
Critical Hdwy Stg 2	5.04	-	-	-	-	
Follow-up Hdwy	3.52	3.41	2.35	-	-	-
Pot Cap-1 Maneuver	322	619	770	-	-	-
Stage 1	527	-	-	-	-	-
Stage 2	823	-	-	-	-	
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	312	618	769	-	-	-
Mov Cap-2 Maneuver	312	-	-	-	-	-
Stage 1	510	-	-	-	-	
Stage 2	823	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	19.66	0.56	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	769	-	312	618	-	-
HCM Lane V/C Ratio	0.03	-	0.335	0.051	-	-
HCM Ctrl Dly (s/v)	9.8	-	22.2	11.1	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	1.4	0.2	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	102	46	34	638	471	130
Future Vol, veh/h	102	46	34	638	471	130
Conflicting Peds, #/hr	0	5	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-4	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	111	50	37	693	512	141

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1003	332	653	0	-	0
Stage 1	583	-	-	-	-	
Stage 2	421	-	-	-	-	-
Critical Hdwy	6.04	6.54	4.16	-	-	-
Critical Hdwy Stg 1	5.04	-	-	-	-	-
Critical Hdwy Stg 2	5.04	-	-	-	-	
Follow-up Hdwy	3.52	3.32	2.23	-	-	-
Pot Cap-1 Maneuver	298	689	923	-	-	-
Stage 1	593	-	-	-	-	-
Stage 2	692	-	-	-	-	
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	286	686	923	-	-	-
Mov Cap-2 Maneuver	286	-	-	-	-	-
Stage 1	570	-	-	-	-	
Stage 2	692	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	20.76	0.46	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	923	-	286	686	-	-
HCM Lane V/C Ratio	0.04	-	0.387	0.073	-	-
HCM Ctrl Dly (s/v)	9.1	-	25.3	10.7	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	1.8	0.2	-	-

APPENDIX D – Future Total Operations Synchro Reports

Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	148	59	35	465	705	101
Future Vol, veh/h	148	59	35	465	705	101
Conflicting Peds, #/hr	1	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-4	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	7	3	3	2	5
Mvmt Flow	161	64	38	505	766	110

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1153	440	878	0	-	0
Stage 1	823	-	-	-	-	
Stage 2	330	-	-	-	-	-
Critical Hdwy	6.04	6.64	4.16	-	-	-
Critical Hdwy Stg 1	5.04	-	-	-	-	-
Critical Hdwy Stg 2	5.04	-	-	-	-	
Follow-up Hdwy	3.52	3.37	2.23	-	-	-
Pot Cap-1 Maneuver	246	579	759	-	-	-
Stage 1	470	-	-	-	-	-
Stage 2	754	-	-	-	-	
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	233	578	757	-	-	-
Mov Cap-2 Maneuver	233	-	-	-	-	-
Stage 1	446	-	-	-	-	
Stage 2	753	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	38.38	0.7	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	757	-	233	578	-	-
HCM Lane V/C Ratio	0.05	-	0.689	0.111	-	-
HCM Ctrl Dly (s/v)	10	-	48.9	12	-	-
HCM Lane LOS	B	-	E	B	-	-
HCM 95th %tile Q(veh)	0.2	-	4.5	0.4	-	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	72	84	65	676	624	168
Future Vol, veh/h	72	84	65	676	624	168
Conflicting Peds, #/hr	2	2	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-4	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	3	2	3	3
Mvmt Flow	78	91	71	735	678	183

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1285	437	866	0	-	0
Stage 1	775	-	-	-	-	
Stage 2	511	-	-	-	-	-
Critical Hdwy	6.04	6.54	4.16	-	-	-
Critical Hdwy Stg 1	5.04	-	-	-	-	-
Critical Hdwy Stg 2	5.04	-	-	-	-	
Follow-up Hdwy	3.52	3.32	2.23	-	-	-
Pot Cap-1 Maneuver	208	595	767	-	-	-
Stage 1	493	-	-	-	-	-
Stage 2	636	-	-	-	-	
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	187	591	763	-	-	-
Mov Cap-2 Maneuver	187	-	-	-	-	-
Stage 1	445	-	-	-	-	
Stage 2	634	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	23.81	0.89	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	763	-	187	591	-	-
HCM Lane V/C Ratio	0.093	-	0.418	0.154	-	-
HCM Ctrl Dly (s/v)	10.2	-	37.3	12.2	-	-
HCM Lane LOS	B	-	E	B	-	-
HCM 95th %tile Q(veh)	0.3	-	1.9	0.5	-	-

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	136	42	25	350	602	105
Future Vol, veh/h	136	42	25	350	602	105
Conflicting Peds, #/hr	0	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-4	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	11	15	3	2	3
Mvmt Flow	148	46	27	380	654	114

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	958	386	770	0	-	0
Stage 1	713	-	-	-	-	
Stage 2	245	-	-	-	-	-
Critical Hdwy	6.04	6.72	4.4	-	-	-
Critical Hdwy Stg 1	5.04	-	-	-	-	-
Critical Hdwy Stg 2	5.04	-	-	-	-	
Follow-up Hdwy	3.52	3.41	2.35	-	-	-
Pot Cap-1 Maneuver	316	613	760	-	-	-
Stage 1	523	-	-	-	-	-
Stage 2	816	-	-	-	-	
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	304	612	759	-	-	-
Mov Cap-2 Maneuver	304	-	-	-	-	-
Stage 1	503	-	-	-	-	
Stage 2	816	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	23.75	0.66	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	759	-	304	612	-	-
HCM Lane V/C Ratio	0.036	-	0.487	0.075	-	-
HCM Ctrl Dly (s/v)	9.9	-	27.6	11.4	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	2.5	0.2	-	-

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	127	54	48	638	471	170
Future Vol, veh/h	127	54	48	638	471	170
Conflicting Peds, #/hr	0	5	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-4	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	138	59	52	693	512	185

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1055	353	697	0	-	0
Stage 1	604	-	-	-	-	
Stage 2	451	-	-	-	-	-
Critical Hdwy	6.04	6.54	4.16	-	-	-
Critical Hdwy Stg 1	5.04	-	-	-	-	-
Critical Hdwy Stg 2	5.04	-	-	-	-	
Follow-up Hdwy	3.52	3.32	2.23	-	-	-
Pot Cap-1 Maneuver	279	669	889	-	-	-
Stage 1	581	-	-	-	-	-
Stage 2	673	-	-	-	-	
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	263	665	889	-	-	-
Mov Cap-2 Maneuver	263	-	-	-	-	-
Stage 1	547	-	-	-	-	
Stage 2	673	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	26.37	0.65	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	889	-	263	665	-	-
HCM Lane V/C Ratio	0.059	-	0.526	0.088	-	-
HCM Ctrl Dly (s/v)	9.3	-	32.9	10.9	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.2	-	2.8	0.3	-	-

APPENDIX E – Synchro Reports for PHF by Movement

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	106	41	29	442	671	85
Future Vol, veh/h	106	41	29	442	671	85
Conflicting Peds, #/hr	1	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-4	-	-	0	0	-
Peak Hour Factor	86	60	66	93	76	85
Heavy Vehicles, %	2	7	3	3	2	5
Mvmt Flow	123	68	44	475	883	100

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1261	493	985	0	-	0
Stage 1	935	-	-	-	-	
Stage 2	327	-	-	-	-	-
Critical Hdwy	6.04	6.64	4.16	-	-	-
Critical Hdwy Stg 1	5.04	-	-	-	-	-
Critical Hdwy Stg 2	5.04	-	-	-	-	
Follow-up Hdwy	3.52	3.37	2.23	-	-	-
Pot Cap-1 Maneuver	214	537	691	-	-	-
Stage 1	422	-	-	-	-	-
Stage 2	756	-	-	-	-	
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	200	536	690	-	-	-
Mov Cap-2 Maneuver	200	-	-	-	-	-
Stage 1	394	-	-	-	-	
Stage 2	756	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	35.51	0.89	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	690	-	200	536	-	-
HCM Lane V/C Ratio	0.064	-	0.616	0.128	-	-
HCM Ctrl Dly (s/v)	10.6	-	48.2	12.7	-	-
HCM Lane LOS	B	-	E	B	-	-
HCM 95th %tile Q(veh)	0.2	-	3.5	0.4	-	-

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	54	63	33	643	594	137
Future Vol, veh/h	54	63	33	643	594	137
Conflicting Peds, #/hr	2	2	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-4	-	-	0	0	-
Peak Hour Factor	79	83	64	95	83	90
Heavy Vehicles, %	2	2	3	2	3	3
Mvmt Flow	68	76	52	677	716	152

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1240	441	873	0	-	0
Stage 1	797	-	-	-	-	
Stage 2	444	-	-	-	-	-
Critical Hdwy	6.04	6.54	4.16	-	-	-
Critical Hdwy Stg 1	5.04	-	-	-	-	-
Critical Hdwy Stg 2	5.04	-	-	-	-	
Follow-up Hdwy	3.52	3.32	2.23	-	-	-
Pot Cap-1 Maneuver	220	592	762	-	-	-
Stage 1	483	-	-	-	-	-
Stage 2	677	-	-	-	-	
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	204	588	758	-	-	-
Mov Cap-2 Maneuver	204	-	-	-	-	-
Stage 1	447	-	-	-	-	
Stage 2	676	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	21.16	0.71	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	758	-	204	588	-	-
HCM Lane V/C Ratio	0.068	-	0.335	0.129	-	-
HCM Ctrl Dly (s/v)	10.1	-	31.3	12	-	-
HCM Lane LOS	B	-	D	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1.4	0.4	-	-

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	111	43	30	465	705	89
Future Vol, veh/h	111	43	30	465	705	89
Conflicting Peds, #/hr	1	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-4	-	-	0	0	-
Peak Hour Factor	86	60	66	93	76	85
Heavy Vehicles, %	2	7	3	3	2	5
Mvmt Flow	129	72	45	500	928	105

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1324	518	1034	0	-	0
Stage 1	982	-	-	-	-	
Stage 2	342	-	-	-	-	-
Critical Hdwy	6.04	6.64	4.16	-	-	-
Critical Hdwy Stg 1	5.04	-	-	-	-	-
Critical Hdwy Stg 2	5.04	-	-	-	-	
Follow-up Hdwy	3.52	3.37	2.23	-	-	-
Pot Cap-1 Maneuver	198	518	662	-	-	-
Stage 1	402	-	-	-	-	-
Stage 2	746	-	-	-	-	
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	184	517	660	-	-	-
Mov Cap-2 Maneuver	184	-	-	-	-	-
Stage 1	374	-	-	-	-	
Stage 2	745	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	43.91	0.9	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	660	-	184	517	-	-
HCM Lane V/C Ratio	0.069	-	0.703	0.139	-	-
HCM Ctrl Dly (s/v)	10.9	-	61	13.1	-	-
HCM Lane LOS	B	-	F	B	-	-
HCM 95th %tile Q(veh)	0.2	-	4.3	0.5	-	-

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	57	66	35	676	624	144
Future Vol, veh/h	57	66	35	676	624	144
Conflicting Peds, #/hr	2	2	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-4	-	-	0	0	-
Peak Hour Factor	79	83	64	95	83	90
Heavy Vehicles, %	2	2	3	2	3	3
Mvmt Flow	72	80	55	712	752	160

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1304	463	917	0	-	0
Stage 1	837	-	-	-	-	
Stage 2	467	-	-	-	-	-
Critical Hdwy	6.04	6.54	4.16	-	-	-
Critical Hdwy Stg 1	5.04	-	-	-	-	-
Critical Hdwy Stg 2	5.04	-	-	-	-	
Follow-up Hdwy	3.52	3.32	2.23	-	-	-
Pot Cap-1 Maneuver	203	575	733	-	-	-
Stage 1	464	-	-	-	-	-
Stage 2	662	-	-	-	-	
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	186	571	730	-	-	-
Mov Cap-2 Maneuver	186	-	-	-	-	-
Stage 1	427	-	-	-	-	
Stage 2	661	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	23.59	0.74	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	730	-	186	571	-	-
HCM Lane V/C Ratio	0.075	-	0.387	0.139	-	-
HCM Ctrl Dly (s/v)	10.3	-	36	12.3	-	-
HCM Lane LOS	B	-	E	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1.7	0.5	-	-

Intersection	
Int Delay, s/veh	11.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	148	59	35	465	705	101
Future Vol, veh/h	148	59	35	465	705	101
Conflicting Peds, #/hr	1	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-4	-	-	0	0	-
Peak Hour Factor	86	60	66	93	76	85
Heavy Vehicles, %	2	7	3	3	2	5
Mvmt Flow	172	98	53	500	928	119

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1346	525	1048	0	-	0
Stage 1	989	-	-	-	-	
Stage 2	357	-	-	-	-	-
Critical Hdwy	6.04	6.64	4.16	-	-	-
Critical Hdwy Stg 1	5.04	-	-	-	-	-
Critical Hdwy Stg 2	5.04	-	-	-	-	
Follow-up Hdwy	3.52	3.37	2.23	-	-	-
Pot Cap-1 Maneuver	192	513	654	-	-	-
Stage 1	400	-	-	-	-	-
Stage 2	735	-	-	-	-	
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	176	512	652	-	-	-
Mov Cap-2 Maneuver	176	-	-	-	-	-
Stage 1	366	-	-	-	-	
Stage 2	734	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	78.38	1.06	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	652	-	176	512	-	-
HCM Lane V/C Ratio	0.081	-	0.977	0.192	-	-
HCM Ctrl Dly (s/v)	11	-	115.3	13.7	-	-
HCM Lane LOS	B	-	F	B	-	-
HCM 95th %tile Q(veh)	0.3	-	7.8	0.7	-	-

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	72	84	65	676	624	168
Future Vol, veh/h	72	84	65	676	624	168
Conflicting Peds, #/hr	2	2	5	0	0	5
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-4	-	-	0	0	-
Peak Hour Factor	79	83	64	95	83	90
Heavy Vehicles, %	2	2	3	2	3	3
Mvmt Flow	91	101	102	712	752	187

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1411	476	943	0	-	0
Stage 1	850	-	-	-	-	
Stage 2	561	-	-	-	-	-
Critical Hdwy	6.04	6.54	4.16	-	-	-
Critical Hdwy Stg 1	5.04	-	-	-	-	-
Critical Hdwy Stg 2	5.04	-	-	-	-	
Follow-up Hdwy	3.52	3.32	2.23	-	-	-
Pot Cap-1 Maneuver	177	564	717	-	-	-
Stage 1	458	-	-	-	-	-
Stage 2	606	-	-	-	-	
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	150	560	713	-	-	-
Mov Cap-2 Maneuver	150	-	-	-	-	-
Stage 1	391	-	-	-	-	
Stage 2	605	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	35.27	1.36	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	713	-	150	560	-	-
HCM Lane V/C Ratio	0.142	-	0.606	0.181	-	-
HCM Ctrl Dly (s/v)	10.9	-	60.2	12.8	-	-
HCM Lane LOS	B	-	F	B	-	-
HCM 95th %tile Q(veh)	0.5	-	3.2	0.7	-	-

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	91	28	20	333	573	88
Future Vol, veh/h	91	28	20	333	573	88
Conflicting Peds, #/hr	0	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-4	-	-	0	0	-
Peak Hour Factor	99	78	71	78	93	67
Heavy Vehicles, %	2	11	15	3	2	3
Mvmt Flow	92	36	28	427	616	131

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	954	376	749	0	-	0
Stage 1	684	-	-	-	-	
Stage 2	270	-	-	-	-	-
Critical Hdwy	6.04	6.72	4.4	-	-	-
Critical Hdwy Stg 1	5.04	-	-	-	-	-
Critical Hdwy Stg 2	5.04	-	-	-	-	
Follow-up Hdwy	3.52	3.41	2.35	-	-	-
Pot Cap-1 Maneuver	318	622	775	-	-	-
Stage 1	538	-	-	-	-	-
Stage 2	798	-	-	-	-	
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	305	621	773	-	-	-
Mov Cap-2 Maneuver	305	-	-	-	-	-
Stage 1	518	-	-	-	-	
Stage 2	798	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	18.8	0.61	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	773	-	305	621	-	-
HCM Lane V/C Ratio	0.036	-	0.301	0.058	-	-
HCM Ctrl Dly (s/v)	9.8	-	21.8	11.2	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	1.2	0.2	-	-

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	97	44	32	607	448	124
Future Vol, veh/h	97	44	32	607	448	124
Conflicting Peds, #/hr	0	5	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-4	-	-	0	0	-
Peak Hour Factor	87	73	80	91	92	89
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	111	60	40	667	487	139

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	970	318	626	0	-	0
Stage 1	557	-	-	-	-	
Stage 2	414	-	-	-	-	-
Critical Hdwy	6.04	6.54	4.16	-	-	-
Critical Hdwy Stg 1	5.04	-	-	-	-	-
Critical Hdwy Stg 2	5.04	-	-	-	-	
Follow-up Hdwy	3.52	3.32	2.23	-	-	-
Pot Cap-1 Maneuver	311	702	945	-	-	-
Stage 1	608	-	-	-	-	-
Stage 2	697	-	-	-	-	
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	298	698	945	-	-	-
Mov Cap-2 Maneuver	298	-	-	-	-	-
Stage 1	583	-	-	-	-	
Stage 2	697	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	19.41	0.51	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	945	-	298	698	-	-
HCM Lane V/C Ratio	0.042	-	0.374	0.086	-	-
HCM Ctrl Dly (s/v)	9	-	24.1	10.6	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	1.7	0.3	-	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	96	29	21	350	602	92
Future Vol, veh/h	96	29	21	350	602	92
Conflicting Peds, #/hr	0	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-4	-	-	0	0	-
Peak Hour Factor	99	78	71	78	93	67
Heavy Vehicles, %	2	11	15	3	2	3
Mvmt Flow	97	37	30	449	647	137

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1001	394	787	0	-	0
Stage 1	718	-	-	-	-	
Stage 2	284	-	-	-	-	-
Critical Hdwy	6.04	6.72	4.4	-	-	-
Critical Hdwy Stg 1	5.04	-	-	-	-	-
Critical Hdwy Stg 2	5.04	-	-	-	-	
Follow-up Hdwy	3.52	3.41	2.35	-	-	-
Pot Cap-1 Maneuver	299	606	749	-	-	-
Stage 1	521	-	-	-	-	-
Stage 2	787	-	-	-	-	
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	286	605	747	-	-	-
Mov Cap-2 Maneuver	286	-	-	-	-	-
Stage 1	499	-	-	-	-	
Stage 2	787	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	20.4	0.62	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	747	-	286	605	-	-
HCM Lane V/C Ratio	0.04	-	0.339	0.061	-	-
HCM Ctrl Dly (s/v)	10	-	23.9	11.3	-	-
HCM Lane LOS	B	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	1.4	0.2	-	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	102	46	34	638	471	130
Future Vol, veh/h	102	46	34	638	471	130
Conflicting Peds, #/hr	0	5	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-4	-	-	0	0	-
Peak Hour Factor	87	73	80	91	92	89
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	117	63	43	701	512	146

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1021	334	658	0	-	0
Stage 1	585	-	-	-	-	
Stage 2	436	-	-	-	-	-
Critical Hdwy	6.04	6.54	4.16	-	-	-
Critical Hdwy Stg 1	5.04	-	-	-	-	-
Critical Hdwy Stg 2	5.04	-	-	-	-	
Follow-up Hdwy	3.52	3.32	2.23	-	-	-
Pot Cap-1 Maneuver	292	687	919	-	-	-
Stage 1	592	-	-	-	-	-
Stage 2	683	-	-	-	-	
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	278	683	919	-	-	-
Mov Cap-2 Maneuver	278	-	-	-	-	-
Stage 1	565	-	-	-	-	
Stage 2	683	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	21.37	0.52	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	919	-	278	683	-	-
HCM Lane V/C Ratio	0.046	-	0.421	0.092	-	-
HCM Ctrl Dly (s/v)	9.1	-	27	10.8	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	2	0.3	-	-

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	136	42	25	350	602	105
Future Vol, veh/h	136	42	25	350	602	105
Conflicting Peds, #/hr	0	0	2	0	0	2
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-4	-	-	0	0	-
Peak Hour Factor	99	78	71	78	93	67
Heavy Vehicles, %	2	11	15	3	2	3
Mvmt Flow	137	54	35	449	647	157

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1022	404	806	0	-	0
Stage 1	728	-	-	-	-	
Stage 2	295	-	-	-	-	-
Critical Hdwy	6.04	6.72	4.4	-	-	-
Critical Hdwy Stg 1	5.04	-	-	-	-	-
Critical Hdwy Stg 2	5.04	-	-	-	-	
Follow-up Hdwy	3.52	3.41	2.35	-	-	-
Pot Cap-1 Maneuver	291	598	736	-	-	-
Stage 1	516	-	-	-	-	-
Stage 2	779	-	-	-	-	
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	276	596	734	-	-	-
Mov Cap-2 Maneuver	276	-	-	-	-	-
Stage 1	490	-	-	-	-	
Stage 2	779	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	24.99	0.74	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	734	-	276	596	-	-
HCM Lane V/C Ratio	0.048	-	0.497	0.09	-	-
HCM Ctrl Dly (s/v)	10.2	-	30.2	11.6	-	-
HCM Lane LOS	B	-	D	B	-	-
HCM 95th %tile Q(veh)	0.2	-	2.6	0.3	-	-

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	127	54	48	638	471	170
Future Vol, veh/h	127	54	48	638	471	170
Conflicting Peds, #/hr	0	5	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	50	0	50	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	-4	-	-	0	0	-
Peak Hour Factor	87	73	80	91	92	89
Heavy Vehicles, %	2	2	3	2	2	3
Mvmt Flow	146	74	60	701	512	191

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1078	356	703	0	-	0
Stage 1	607	-	-	-	-	
Stage 2	471	-	-	-	-	-
Critical Hdwy	6.04	6.54	4.16	-	-	-
Critical Hdwy Stg 1	5.04	-	-	-	-	-
Critical Hdwy Stg 2	5.04	-	-	-	-	
Follow-up Hdwy	3.52	3.32	2.23	-	-	-
Pot Cap-1 Maneuver	271	666	884	-	-	-
Stage 1	579	-	-	-	-	-
Stage 2	660	-	-	-	-	
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	253	662	884	-	-	-
Mov Cap-2 Maneuver	253	-	-	-	-	-
Stage 1	540	-	-	-	-	
Stage 2	660	-	-	-	-	-

Approach	EB	NB	SB
HCM Ctrl Dly, s/v	28.33	0.74	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	884	-	253	662	-	-
HCM Lane V/C Ratio	0.068	-	0.578	0.112	-	-
HCM Ctrl Dly (s/v)	9.4	-	37	11.1	-	-
HCM Lane LOS	A	-	E	B	-	-
HCM 95th %tile Q(veh)	0.2	-	3.3	0.4	-	-

APPENDIX F – Traffic Signal Warrants

City of St.John's - Traffic Signal & Pedestrian Signal Head Warrant Analysis

Main Street (name)	Higgins Line	Direction (EW or NS)	NS	Road Authority:	City of St.John's
Side Street (name)	Bell's Turn	Direction (EW or NS)	EW	City:	City of St.John's
Quadrant / Int #		Comments	Existing	Analysis Date:	2025 Dec 02, Tue
for Warrant Calculation Results, please hit 'Page Down'	CHECK SHEET			Count Date:	2025 Dec 02, Tue
				Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th & LT	Through	Thr+RT+LT	Th & RT	Excl RT	RT Channelization (y/n)	UpStream Signal (m)	# of Thru Lanes	LT Phase Type	RTOR Allowed (y/n)	Actuated Thru Phase
Higgins Line	NB	1		2				n	400	2	perm	y	
Higgins Line	SB			1		1		n	170	2	perm	y	
Bell's Turn	WB									0			
Bell's Turn	EB	1					1	n	1,600	0	perm	y	
							n						
Are the Higgins Line SB right turns significantly impeded by through movements? (y/n)							n						

Saturation Flow Rates (if not default) (vphpl)		Default Saturation Flow Rates (vphpl)
Left Turn		1,650
Through		1,800
Right Turn		1,500

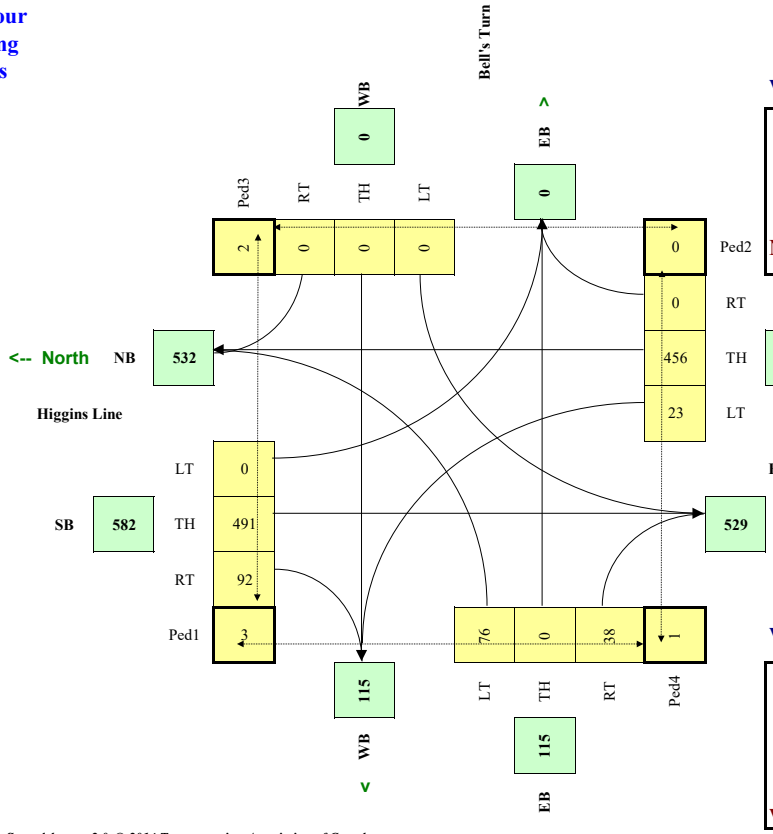
Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	110,525
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
Higgins Line	NS	50	2.0%	y	0.0
Bell's Turn	EW	50	2.0%	y	0.0

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side
7:00 - 8:00	5	231	0	0	318	38	0	0	0	55	0	15	1	0	1	0
8:00 - 9:00	29	442	0	0	671	85	0	0	0	106	0	41	2	0	1	0
12:00 - 13:00	22	489	0	0	452	97	0	0	0	76	0	31	5	0	2	0
13:00 - 14:00	28	437	0	0	486	82	0	0	0	78	0	41	0	0	3	0
16:00 - 17:00	29	636	0	0	571	128	0	0	0	72	0	63	4	0	0	1
17:00 - 18:00	25	499	0	0	445	120	0	0	0	70	0	39	6	0	6	3
Total (6-hour peak)	**138**	**2,734**	**0**	**0**	**2,943**	**550**	**0**	**0**	**0**	**457**	**0**	**230**	**18**	**0**	**13**	**4**
Average (6-hour peak)	**23**	**456**	**0**	**0**	**491**	**92**	**0**	**0**	**0**	**76**	**0**	**38**	**3**	**0**	**2**	**1**
													Actual Pedestrian Crossing Distance (m)			

Average 6-hour Peak Turning Movements



$W_{SIG} = [C_{bt}(X_{v\text{-}v}) / K_1 + (F (X_{v\text{-}p}) L) / K_2] \times C_i$

W =	54	51	3
		Veh	*Ped*

NOT Warranted

RESET SHEET

$W_{PED} = [F ((Xped_m)d_m/K_2) + (Xped_s)d_s/K_3)]$

W = 0

Warranted - Complex Intersection

City of St.John's - Traffic Signal & Pedestrian Signal Head Warrant Analysis

Main Street (name)	Higgins Line	Direction (EW or NS)	NS	Road Authority:	City of St.John's
Side Street (name)	Bell's Turn	Direction (EW or NS)	EW	City:	City of St.John's
Quadrant / Int #		Comments	5-year Background Horizon	Analysis Date:	2025 Dec 02, Tue
for Warrant Calculation Results, please hit 'Page Down'	CHECK SHEET			Count Date:	2025 Dec 02, Tue
				Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th & LT	Through	Thr+RT+LT	Th & RT	Excl RT	RT Channelization (y/n)	UpStream Signal (m)	# of Thru Lanes	LT Phase Type	RTOR Allowed (y/n)	Actuated Thru Phase
Higgins Line	NB	1		2				n	400	2	perm	y	
Higgins Line	SB			1		1		n	170	2	perm	y	
Bell's Turn	WB									0			
Bell's Turn	EB	1					1	n	1,600	0	perm	y	

Saturation Flow Rates (if not default) (vphpl)		Default Saturation Flow Rates (vphpl)
Left Turn		1,650
Through		1,800
Right Turn		1,500

Are the Higgins Line SB right turns significantly impeded by through movements? (y/n) n

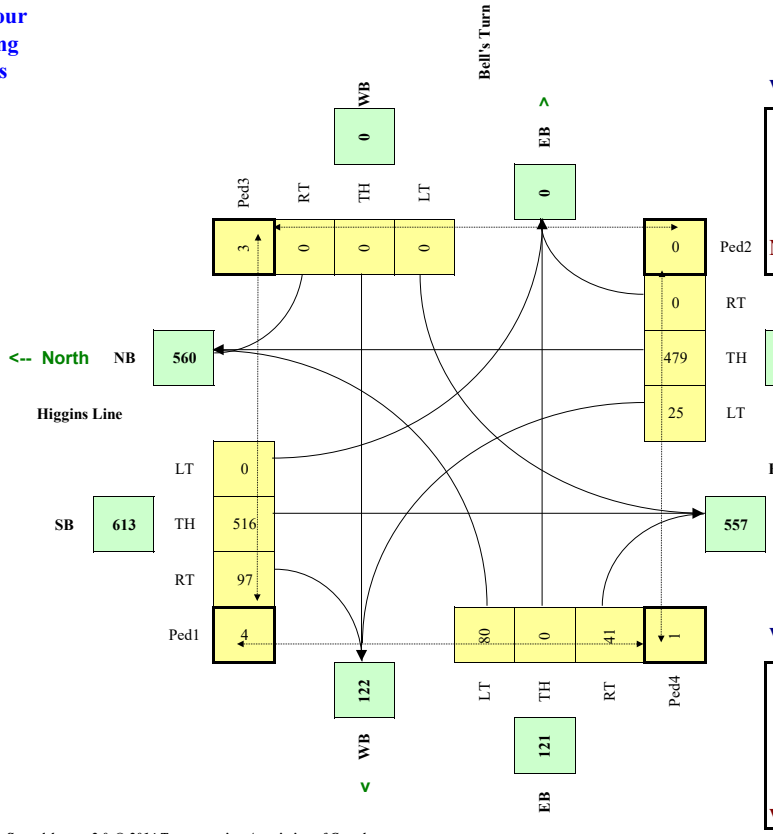
Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	110,525
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
Higgins Line	NS	50	2.0%	y	0.0
Bell's Turn	EW	50	2.0%	y	0.0

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side
7:00 - 8:00	6	243	0	0	335	40	0	0	0	58	0	16	2	0	2	0
8:00 - 9:00	31	465	0	0	706	90	0	0	0	112	0	44	3	0	2	0
12:00 - 13:00	24	514	0	0	476	102	0	0	0	80	0	33	6	0	3	0
13:00 - 14:00	30	460	0	0	511	87	0	0	0	82	0	44	0	0	4	0
16:00 - 17:00	31	669	0	0	601	135	0	0	0	76	0	67	5	0	0	2
17:00 - 18:00	27	525	0	0	468	127	0	0	0	74	0	41	7	0	7	4
Total (6-hour peak)	**149**	**2,876**	**0**	**0**	**3,097**	**581**	**0**	**0**	**0**	**482**	**0**	**245**	**23**	**0**	**18**	**6**
Average (6-hour peak)	**25**	**479**	**0**	**0**	**516**	**97**	**0**	**0**	**0**	**80**	**0**	**41**	**4**	**0**	**3**	**1**
													Actual Pedestrian Crossing Distance (m)			

Average 6-hour Peak Turning Movements



$W_{SIG} = [C_{bt}(X_{v-v}) / K_1 + (F (X_{v-p}) L) / K_2] \times C_i$

W =	62	57	5
		Veh	*Ped*

NOT Warranted

RESET SHEET

$W_{PED} = [F ((Xped_m)d_m/K_2) + (Xped_s)d_s/K_3)]$

W = 0

Warranted - Complex Intersection

City of St.John's - Traffic Signal & Pedestrian Signal Head Warrant Analysis

Main Street (name)	Higgins Line	Direction (EW or NS)	NS	Road Authority:	City of St.John's
Side Street (name)	Bell's Turn	Direction (EW or NS)	EW	City:	City of St.John's
Quadrant / Int #		Comments	5-year Total Horizon	Analysis Date:	2025 Dec 02, Tue
for Warrant Calculation Results, please hit 'Page Down'	CHECK SHEET			Count Date:	2025 Dec 02, Tue
				Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th & LT	Through	Thr+RT+LT	Th & RT	Excl RT	RT Channelization (y/n)	UpStream Signal (m)	# of Thru Lanes	LT Phase Type	RTOR Allowed (y/n)	Actuated Thru Phase
Higgins Line	NB	1		2				n	400	2	perm	y	
Higgins Line	SB			1		1		n	170	2	perm	y	
Bell's Turn	WB									0			
Bell's Turn	EB	1					1	n	1,600	0	perm	y	

Are the Higgins Line SB right turns significantly impeded by through movements? (y/n) y

Saturation Flow Rates (if not default) (vphpl)		Default Saturation Flow Rates (vphpl)
Left Turn		1,650
Through		1,800
Right Turn		1,500

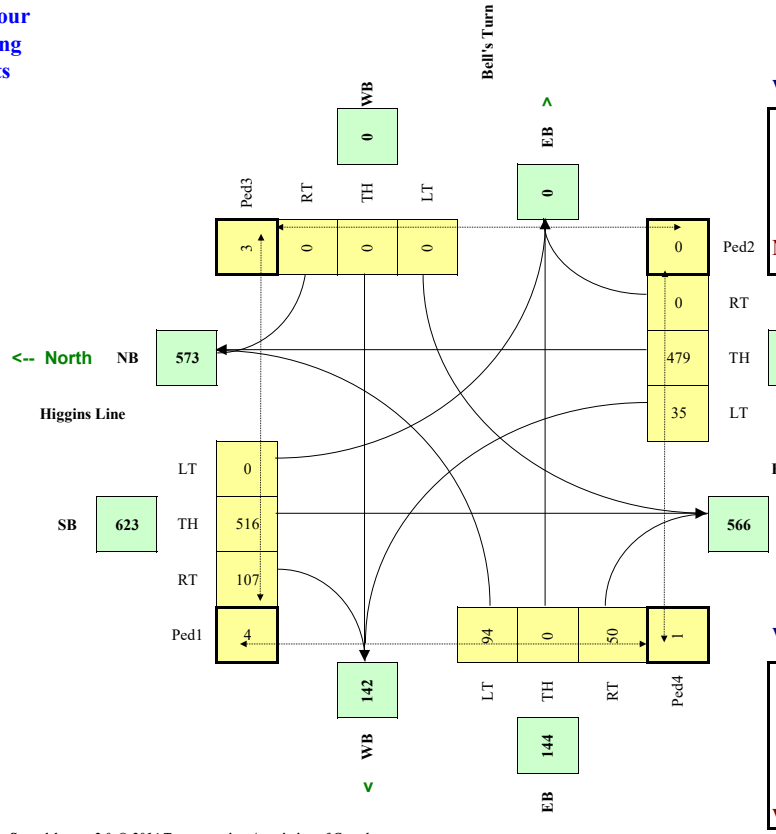
Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	110,525
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
Higgins Line	NS	50	2.0%	y	0.0
Bell's Turn	EW	50	2.0%	y	0.0

Set Peak Hours

Traffic Input	NB			SB			WB			EB			Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side
7:00 - 8:00	8	243	0	0	335	46	0	0	0	76	0	24	2	0	2	0
8:00 - 9:00	36	465	0	0	706	102	0	0	0	149	0	60	3	0	2	0
12:00 - 13:00	24	514	0	0	476	102	0	0	0	80	0	33	6	0	3	0
13:00 - 14:00	30	460	0	0	511	87	0	0	0	82	0	44	0	0	4	0
16:00 - 17:00	61	669	0	0	601	159	0	0	0	91	0	85	5	0	0	2
17:00 - 18:00	51	525	0	0	468	146	0	0	0	86	0	55	7	0	7	4
Total (6-hour peak)	**210**	**2,876**	**0**	**0**	**3,097**	**642**	**0**	**0**	**0**	**564**	**0**	**301**	**23**	**0**	**18**	**6**
Average (6-hour peak)	**35**	**479**	**0**	**0**	**516**	**107**	**0**	**0**	**0**	**94**	**0**	**50**	**4**	**0**	**3**	**1**
													Actual Pedestrian Crossing Distance (m)			

Average 6-hour Peak Turning Movements



$W_{SIG} = [C_{bt}(X_{v\text{-}v}) / K_1 + (F (X_{v\text{-}p}) L) / K_2] \times C_i$

W = 75 70 5

Veh *Ped*

NOT Warranted

RESET SHEET

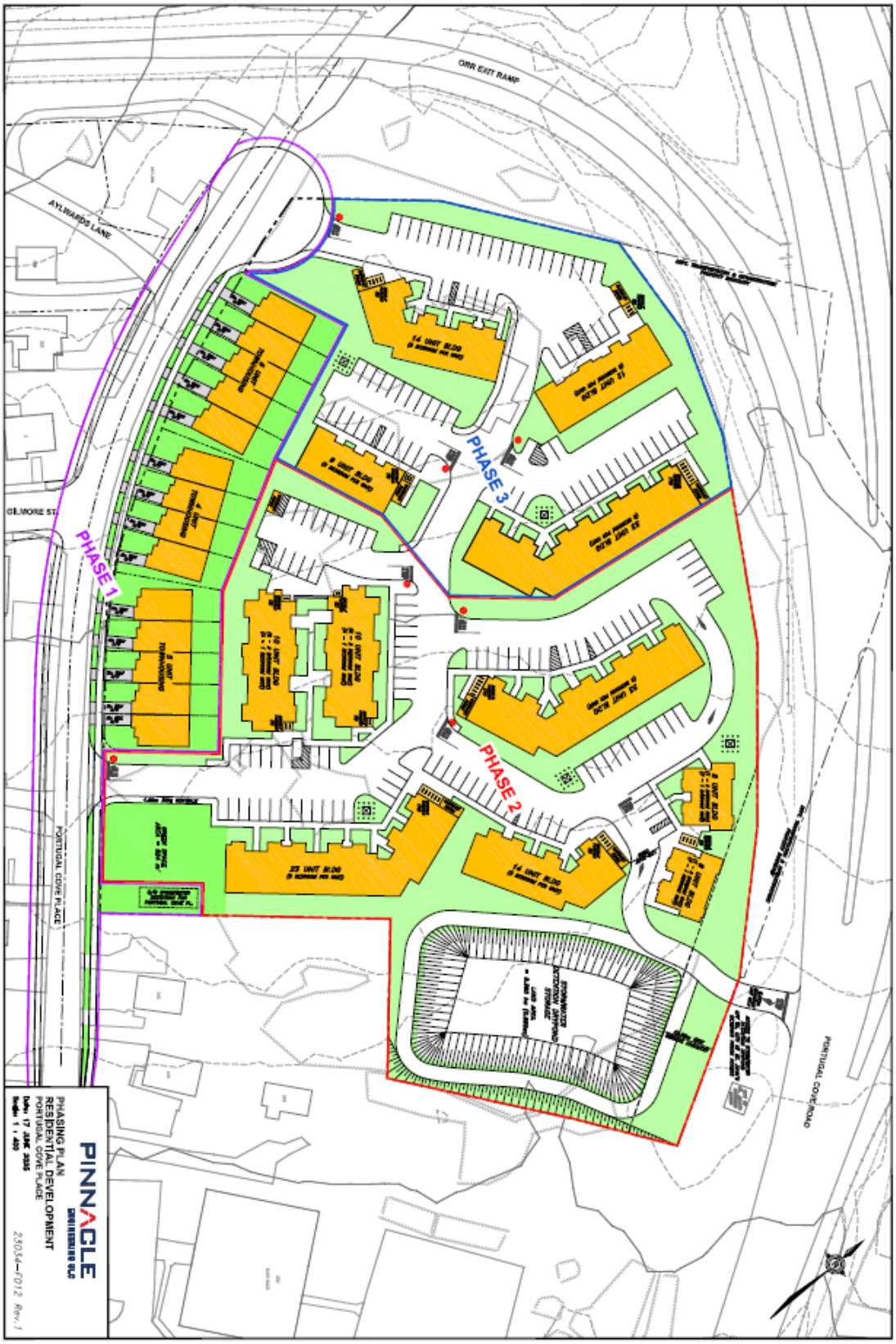
$W_{PED} = [F ((Xped_m)d_m/K_2) + (Xped_s)d_s/K_3)]$

W = 0

Warranted - Complex Intersection

HarboursideEngineering.ca

APPENDIX M – PHASING OF PROJECT



APPENDIX N – STREET UPGRADES TO PORTUGAL COVE PLACE