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<th>Quality Check</th>
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1.0 INTRODUCTION

Westrich Management Ltd. (“Westrich”) has retained Stantec Consulting Ltd. (“Stantec”) to complete a Transportation Impact Assessment for a multifamily development in the Garneau neighbourhood of Edmonton. The project is located on a 0.324 ha parcel south of 86 Avenue between 110 and 111 Streets and covers eight lots which are currently occupied by single-family homes. These eight lots are:

- 11023 86 Avenue NW
- 11027 86 Avenue NW
- 11031 86 Avenue NW
- 11033 86 Avenue NW
- 11037 86 Avenue NW
- 11041 86 Avenue NW
- 11043 86 Avenue NW
- 11045 86 Avenue NW

The location of the site is illustrated in Figure 1.1.

The proposed development will consist of a six-story residential apartment building with up to 159 units, requiring it to be rezoned from the existing RF6 (Medium Density Multi-Family Zone), which limits development to a maximum density of 80 du/ha, to a DC2 zoning (Site Specific Development Control Provision) to allow for reduced setbacks and greater density than the current zoning. The proposed development concept includes underground parking with access via the alley to the south.
1.1 STUDY SCOPE

The objectives of this assessment include:

- Complete a site observation to assess the existing transportation conditions at the 111 Street and 110 Street alley intersections and complete a descriptive analysis to identify any existing issues in the study area.
- Estimate multi-modal trip generation (walking, cycling, transit, and driving) for the proposed development during the AM and PM peak hours, based on the City’s rates, industry best practices, and tailored considerations based on the context of the redevelopment and its location.
- Review active modes of transportation opportunities and identify any existing safety concerns on the adjacent roadways.
- Assess the proposed parking supply for the development, comparing it to the parking requirements based on Edmonton zoning bylaw standards.
- Review the existing alley operations and conditions and discuss potential issues, improvements, and treatments to be considered in conjunction with the development.

Based on scoping discussions with the City of Edmonton, intersection capacity analysis is not required for this project due to the context of the site and the size of the development.
2.0 EXISTING CONDITIONS

2.1 ROAD NETWORK

The site is located on the south side of 86 Avenue, between 110 Street and 111 Street, with access to be provided via the east-west alley located to the south. Further information about the study roadways follows:

86 Avenue ("Oliver Avenue") is a one-way westbound local road with on-street parking on the north side of the road (limited to residents until 6 PM on weekdays)

110 Street is a one-way northbound local road with on-street parking on the east side of the road as follows:

- North of 86 Avenue – loading zone from 7 AM to 5 PM on weekdays with 30 min passenger parking
- South of 86 Avenue – resident-only parking until 6 PM on weekdays

111 Street is a local road which is one-way southbound south of 86 Avenue, with on-street parking as follows:

- West side of 111 Street south of 86 Avenue – 30 min public parking from 9 AM to 9 PM on weekdays
- East side of 111 Street north of 86 Avenue – limited to residents until 6 PM on weekdays

The E/W Alley is a two-way paved alley which is approximately 5 m wide.

2.2 EXISTING TRAFFIC VOLUMES

Recent traffic volume data at intersections and road sections adjacent to the project area are available from the City of Edmonton’s website, including:

- Turning movements at 87 Avenue & 111 Street (2013)
- Turning movements at 86 Avenue & 109 Street (2015)
- Daily traffic volumes on 86 Avenue west of 109 Street (2015)
- Daily traffic volumes on 110 Street north of 85 Avenue (2015)

The proposed Maclab Development, which is near the Garneau 86 Avenue Development, located at the northeast corner of 112 Street and 86 Avenue, was approved by the City Council in the summer of 2019. Based on the existing Transportation & Parking Impact Assessment (February 7, 2019) for this development, which was prepared by Bunt & Associates, traffic counts at the following locations are available:

- Turning movements at 87 Avenue and 111 Street (September 2018)
- Turning movements at 86 Avenue and 111 Street (September 2018)
- Daily traffic volumes on 86 Avenue East of 111 Street (September 2018)
- Daily traffic volumes on 111 Street Sound of 86 Avenue (September 2018)
Intersection traffic counts were conducted at the alley intersections during the weekday morning peak hour between 7:45 am and 8:45 am and afternoon peak hour between 5 pm and 6 pm on Tuesday, December 11th, 2018, based on the peak hours identified at the nearby City of Edmonton traffic count locations. The resulting estimated peak-hour vehicle and pedestrian traffic volumes are shown in Figure 2.1. It was noted that a high volume of pedestrians was observed along the east side of 110 Street during the AM peak, but not during the PM peak. This pedestrian traffic was mainly school-related traffic which would be expected to peak earlier than the observed PM peak hour.

Daily traffic volumes on the roadways in the study area were estimated using the formula: Daily Traffic Volumes (D) = 6.5*(AM Peak Hour Volumes + PM Peak Hour Volumes), consistent with the Maclab TIA.

**Figure 2.1 – Existing Traffic and Pedestrian Volumes (2018)**

The traffic volumes on 111 Street south of 86 Avenue collected by Bunt in September 2018 are slightly higher than the traffic counts for the same road section by Stantec in December 2018. This likely reflects higher University-related traffic during September; it is expected that peak traffic volumes may be 20-25% higher than shown in Figure 2.1 during the busiest times of the semester.

Based on the traffic volume information from the City’s website and the Maclab TIA, the current traffic volumes on 86 Avenue are approximately 1,350 vehicles per day (vpd) east of 111 Street. Based on the traffic counts above, the current traffic volumes are approximately 1,700 vpd on 111 Street and 1,600 vpd on 110 Street. These volumes along the roadways in the study area exceed the TAC daily threshold for local roads, which is 1,000 vpd. However, no
GARNEAU 86 AVENUE DC2 REZONING – TRANSPORTATION IMPACT ASSESSMENT

Existing Conditions
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existing capacity issues were observed, and it is expected that the existing cross-sections of these roads provide sufficient capacity to accommodate the demand. Current traffic volumes in the alley are approximately 80-130 vpd.

Based on the context of the site, the traffic data in the study area shows an existing heavy vehicle percentage of less than 1%. The area has fairly high pedestrian volumes due to the proximity to the University of Alberta as well as Garneau School, and the nearby Whyte Avenue Commercial District.

The AADT traffic volumes from 2011 to 2016 show stagnant traffic growth ranging from -2% to 2% annually at different points along 109 Street. As the study area is relatively saturated, it is expected that minimal traffic growth will be encountered in the area. Increased opportunities for alternative travel modes in the area (e.g. bike lanes, transit service) may continue to decrease vehicular traffic demand.

2.3 SITE OBSERVATIONS

Site visits were performed in the study area during the weekday morning and afternoon peak periods on December 11th, 2018. The observations made during these visits are outlined below.

Traffic Capacity and Operations

No capacity issues were observed based on the observed traffic volumes on the local roads adjacent to the site. The adjacent intersections of 86 Avenue & 110 Street and 86 Avenue & 111 Street are both 3-way stop-controlled. Since the adjacent roadways are all one-way operation, road width and passing maneuvers are not a concern.

Parking

Parking is currently allowed on the north side of 86 Avenue, the east side of 110 Street, and the west side (south of 86 Avenue) and east side (north of 86 Avenue) of 111 Street. These parking areas were observed to have capacity available during peak hours. Private parking is available off the alley for most of the residences.

Alley Conditions

The east-west oriented alley provides access to private driveways and parking spots to both the north and south. A power line runs along the south side of the alley; based on the site observation, the pole locations do not impede traffic movements. The effective width of the alley is approximately 5 m wide, which is wider than the standard 4 m for a residential alley. It is expected that two vehicles traveling in opposing directions should be able to pass each other by pulling over into the adjacent parking areas, although this movement was not observed. The alley is paved.

Parking is prohibited on the west side of 110 Street and the east side of 111 Street, south of 86 Avenue, in the study area (adjacent to the alley entrances) due to the painted bike lanes. This allows for clear sightlines for vehicles exiting the alley. The one-way traffic control is well-signed, and no wrong-way or illegal movements were observed.

Overall, the observed traffic volumes in the alley are relatively low, and capacity or operational issues in the alley were not observed and are not expected.
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Active Modes Facilities

Paved sidewalks are available on both sides of 86 Avenue and 111 Street, as well as the east side of 110 Street in the study area. Marked crosswalks at all corners are available at both 86 Avenue Intersections on 110 Street and 111 Street. Pedestrians were observed to use these facilities; in particular, high pedestrian volumes were observed along the east side of 110 Street in the morning peak hour (leading to Garneau School) and along the west side of 111 Street in both peak hours (leading to/from the University). Both heavy pedestrian paths are located on the opposite side of the street of the alley entrances and do not impede vehicle movements.

There are two painted contra-flow bike lanes provided on both 110 Street and 111 Street, which are one-way in the opposing direction as the one-way vehicular traffic; cyclists were observed using these facilities as marked. There is some risk that vehicles exiting the alley will fail to look left for bikes using these bike lanes as they are conditioned to look right only for vehicle traffic. This behavior was not observed but is noted as a potential safety issue.

School Site Observations

The Garneau School is an elementary school located on the northeast quadrant of 86 Avenue and 110 Street, diagonal to the project site. Several safety features are included at this site, including the following:

- At the intersection of 86 Avenue and 110 Street, the 3-way stop signs have high-visibility poles.
- Adjacent to the school site, 110 Street, 86 Avenue, and 87 Avenue are all designated Playground Zones with 30 km/h speed limits. These signs are also marked with high-visibility poles.
- Marked crosswalks are provided on all four legs of the intersection of 86 Avenue and 110 Street.
- Marked crosswalks without zebra markings are provided on both the east and west sides of the intersection of 87 Avenue and 110 Street with the application of pedestrian-actuated signals.
- Sidewalks are provided on all sides of the school site.

A School Zone Safety Review for Garneau School was conducted in 2018 and the following additional safety improvements were recommended:

- Adding zebra markings for the two north-south crosswalks at 110 Street & 87 Avenue Intersection.
- Adding a new crosswalk with zebra markings on west leg of 109 Street & 86 Avenue Intersection.

Overall, based on the field safety observation, vehicle and pedestrian safety accessing the school appears to be sufficient and no existing safety concerns were identified.
3.0 PROPOSED DEVELOPMENT AND TRIP GENERATION

3.1 PROPOSED DEVELOPMENT

The proposed six storey development will consist of 159 apartment-style residential units with an underground parkade accessed via the alley to the south. Figure 3.1 illustrates the site plan for the development.

The breakdown of the dwelling unit types is expected to be as follows:

- 1 Bedroom / Studio – 49 Dwelling Units
- 2 Bedroom – 98 Dwelling Units
- 3+ Bedroom – 12 Dwelling Units
3.2 TRIP GENERATION

Trip generation for the site was calculated for the AM and PM peak hours as well as daily. The trips were calculated using the City of Edmonton 2013 Trip Generation Rates for “RA7 & RA8 – Apartment Housing” Table 3.1 shows the traffic generated for the AM and PM peak periods of the sites.

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Units</th>
<th>Trip Rate</th>
<th>% IN</th>
<th>% OUT</th>
<th>Total Trips</th>
<th>Trips IN</th>
<th>Trips OUT</th>
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</thead>
<tbody>
<tr>
<td>AM Peak Hour</td>
<td>159</td>
<td>0.34 / DU</td>
<td>17%</td>
<td>83%</td>
<td>54</td>
<td>9</td>
<td>45</td>
</tr>
<tr>
<td>PM Peak Hour</td>
<td>159</td>
<td>0.40 / DU</td>
<td>63%</td>
<td>37%</td>
<td>64</td>
<td>40</td>
<td>24</td>
</tr>
<tr>
<td>Daily</td>
<td>159</td>
<td>5.81 / DU</td>
<td>50%</td>
<td>50%</td>
<td>924</td>
<td>462</td>
<td>462</td>
</tr>
</tbody>
</table>

3.3 TRIP REDUCTIONS

3.3.1 Multi-Modal Split

The proposed development is located within 600 m of the Capital Line LRT Health Sciences Jubilee Station, within 500 m of the University LRT Station and Transit Centre, and close to 109 Street which is a designated Transit Avenue. These factors suggest that the vehicular trip generation by the development is likely significantly less than the typical trip generation rates, with travel modes such as walking, biking, and transit as popular alternatives.

Edmonton’s 2016 Municipal Census provides data on the primary mode of transportation from home to work with results organized by neighbourhood. The mode split for City-wide trips and Garneau neighbourhood trips are shown in Figure 3.2.

Figure 3.2 – Edmonton 2016 Municipal Census: Travel Mode from Home to Work
The overall City of Edmonton mode split shows that 72% of respondents drove a vehicle as their primary mode of transportation from home to work. Comparatively, in the Garneau neighbourhood, only 40% of respondents drove a vehicle as their primary mode of transportation, a 44% decrease from the City-wide results. Based on the location of the site in close proximity to the University and the development type, it is expected that the student population in this development will be high, and the mode split may be even greater than the Garneau neighbourhood overall. Based on these factors, it can reasonably be assumed that vehicle trips for this development will be approximately 50% lower than the standard Edmonton-wide trip generation rates would suggest. This 50% reduction in vehicle trips would be reallocated to other travel mode choices, such as walking and cycling. The revised vehicle trip generation is summarized in Table 3.2.

As shown, the resulting projected vehicular trips are in the order of 30 vehicles in the peak hours entering and exiting the site. Moreover, some recently collected traffic data by the City of Edmonton for other transportation studies suggests that the daily volumes shown in the Table 3.2 are likely overestimated. The analysis in this study is based on the conservative traffic volumes which may be higher than the traffic volumes in reality to cover the worst-case scenario in terms of traffic operation.

### 3.4 TRIP DISTRIBUTION AND ASSIGNMENT

It is expected that site-generated traffic will follow the existing travel patterns in the area, with more vehicles using the 111 Street intersection than the 110 Street intersection. Most of those trips will be accessing the parkade via the alley, although a small number of visitor trips may choose to access the site via 86 Avenue to park on the street. The estimated site-generated traffic at the study intersections is shown in Figure 3.3.
Based on the one-way nature of both 111 and 110 Streets abutting the E/W Alley, all southbound site-generated traffic will enter and exit via 111 Street, while all northbound site-generated traffic will enter and exit via 110 Street. From these points, traffic will be distributed to the road network, likely via 87 Avenue and Whyte Avenue.

### 3.5 ADJACENT DEVELOPMENT

As described previously, the proposed Maclab Development, is located near the Garneau 86 Avenue Development, at the northeast corner of 112 Street and 86 Avenue. From the associated TIA prepared by Bunt & Associates, traffic generated by this site will utilize 111 Street. The magnitude of this traffic on the study intersections for this development are illustrated in Figure 3.4.

![Figure 3.4 – Adjacent (Maclab) Development Site-Generated Traffic Volumes [AM Peak Hour (PM Peak Hour)]](image)

### 3.6 TOTAL TRAFFIC VOLUMES

The total projected traffic volumes are the summation of the existing traffic volumes, the site-generated traffic volumes, and the adjacent development volumes. These total traffic volumes are shown in Figure 3.5.
Daily traffic volumes on 111 Street are projected to increase to approximately 2,450 vpd, due in large part to the adjacent Maclab Development. This is greater than the 1,000 vpd threshold for local roads; however, it is expected that as a one-way street the capacity on 111 Street is actually higher, as vehicles don’t have to accommodate opposing traffic. Daily traffic volumes on 110 Street are within the same range as existing and are expected to be accommodated by the road cross-section. Total daily traffic volumes in the alley are projected to be up to 360 vpd. While the City of Edmonton does not provide a daily traffic volume threshold for alleys, it is believed that capacity would be similar to that of a local road which has a capacity of 1,000 vpd, suggesting that the alley will be able to accommodate the development traffic.
4.0 MULTI-MODAL TRANSPORTATION ASSESSMENT

4.1 VEHICLE OPERATIONS

The intersections of 86 Avenue and 110/111 Street are three-way stop-controlled. Based on the existing traffic volumes on 110 and 111 Street, traffic capacity issues are not expected at this location. This is consistent with the site observation, which found traffic volumes to be in the order of 100-200 vehicles in the peak hour on each street. As described in Sections 2.2 and 3.6, daily traffic volumes along 86 Avenue, 111 Street, and 110 Street currently exceed the threshold of 1,000 vpd for local roadways. However, as one-way streets, it is expected that the capacity is actually higher than this, as vehicles don’t have to accommodate opposing traffic. No existing capacity issues were observed at the study intersections, and it is expected that the existing cross-sections of these roads provide sufficient capacity to accommodate traffic demand.

The intersection of 111 Street & 87 Avenue is expected to have a small number of vehicles assigned to the eastbound right and westbound left turning movements by users entering the site, as well as potentially the westbound through movements from users exiting the site via 110 Street. As the overall site-generated volumes are quite low, it is expected that this dispersed traffic will not meaningfully impact the traffic volumes or operations at the 111 Street & 87 Avenue intersection.

4.2 PEDESTRIAN FACILITIES

The site is located in an urban area and therefore sidewalks are generally available on both sides of the street in the project area, with the following exceptions:

- Missing sidewalk on the west side of 110 Street between 83 Avenue and 87 Avenue
- Missing sidewalk on the east side of 111 Street south of 85 Street

Neighbourhood Renewal is ongoing in Garneau; while this is not complete, it is understood that these missing sidewalk links will be provided as part of this project. Marked crosswalks are available on all legs of the local intersections immediately adjacent to the site.

4.3 BICYCLE FACILITIES

Bike facilities adjacent to the development site and in the surrounding area include the following:

- Painted one-way bike lanes on 110 and 111 Street immediately adjacent to the development site (with shared traffic paint markings for the opposing direction of travel).
- Shared roadways on 84 and 85 Avenue, south of the site.
- Protected bike lanes are provided on 83 Avenue east of 106 Street; planned to be extended to 111 Street in the future

The existing bicycle facilities are also illustrated in Figure 4.1.
It is anticipated that 110 Street will be converted to include a two-way protected bike lane as part of the Garneau Neighbourhood Renewal project. It is expected that most cyclists from this area who intend to bike to the University of Alberta or Downtown will be able to do so using existing or proposed facilities for the majority of their journey.

### 4.4 TRANSIT SERVICES

The site is currently well serviced by transit with several routes running along 109 Street, 112 Street, and 82 Avenue. The site is also located approximately 600 m from the Capital Line LRT Health Sciences Jubilee Station, and 500 m from the University LRT Station and Transit Centre.

The City of Edmonton Transit System Map in the project vicinity is illustrated in Figure 4.2.
The City of Edmonton’s Bus Network Redesign and Transit Service Policy were approved in November 2019. It is expected that bus service will continue along the same corridors, providing a variety of route types as described below.

- **Frequent Bus Routes**, which are intended to provide more frequent bus service with buses coming every 15 mins or better at most times of the day, seven days per week (*provided on 109 Street, 82 Avenue, and 112 Street*)

- **Rapid (Peak-Only) Bus Routes**, which are intended to provide express bus service to connect downtown and suburban areas with limited stops. These express bus routes will operate during peak hours only (*provided on 112 Street*)

- **Local routes**, which will connect neighbourhoods to local destinations and other routes (*provided on 82 Avenue and 112 Street*)

- **Community Bus Routes**, which are intended to provide service in proximity to seniors’ residences, schools, and local activity centres (*provided on 82 Avenue and 112 Street*)

The closest transit stops to the site are on 109 Street southbound (300 m walking distance) and 112 Street northbound (350 m walking distance). However, it is expected that most users will walk to the University Transit Centre for the greater variety of routes and higher frequency buses available.
5.0 PARKING ASSESSMENT

As discussed in Section 3.3.1, the proposed development is located within 600 m of existing LRT stations and transit centres, qualifying it as a Transit Oriented Development (TOD). Therefore, the parking requirements for the site should be calculated using Edmonton Zoning Bylaw Schedule 1(C), TOD and Main Streets Guidelines for Core and Mature Neighbourhoods. Table 5.1 summarizes the parking requirements for the development as per this zoning.

Table 5.1 – Parking Requirements (Schedule 1C)

<table>
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<th>Land Use</th>
<th>Units</th>
<th>Rate</th>
<th>Stalls</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>1 Bedroom / Studio</td>
<td>49</td>
<td>0.5/DU</td>
<td>1.0/DU</td>
</tr>
<tr>
<td>2 Bedroom Dwelling</td>
<td>98</td>
<td>0.75/DU</td>
<td>1.5/DU</td>
</tr>
<tr>
<td>3+ Bedroom Dwelling</td>
<td>12</td>
<td>1.0/DU</td>
<td>1.75/DU</td>
</tr>
<tr>
<td>Visitor Parking</td>
<td>159</td>
<td>1.0/10 DU (after first 10)*</td>
<td>1.0/7 DU (after first 7)</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>125</td>
<td>239</td>
</tr>
</tbody>
</table>

*Schedule 1C requires the shown maximum rate for visitor stalls (1 per 7 stalls); however, a lower rate of 1 per 10 dwelling units has been approved in similar contexts due to the alternative travel mode options available in the area.

As shown, the site will require between 125 and 239 total parking stalls based on the zoning requirements. The latest design from the developer features 164 vehicle parking stalls within the two-story parkade, which is within the guidelines for the development. In addition, at least 110 secured bicycle parking stalls will be required.
6.0 ALLEY SAFETY AND OPERATIONS

As per Section 2.2.2, no current operational issues were observed in the alley. The observed traffic volumes in the alley are relatively low, so vehicle conflicts are not expected; however, in the case of two vehicles travelling in opposite directions in the alley, there are opportunities for vehicles to allow others to pass. Due to the parking restrictions on the adjacent streets, sightlines are clear for vehicles exiting the alley.

Vehicles exiting the alley may fail to look left to check for bike traffic in the contra-flow bike lanes on 110 and 111 Street, as the streets are marked as one-way for vehicular traffic. To mitigate this risk, it is recommended to add green paint to indicate the conflict area at the crossing point and add additional signage cautioning drivers to look left for bikes. For example, the Manual on Uniform Traffic Control Devices (MUTCD) signs R3-17 and R15-8 may be used in combination to alert vehicles to look both ways before exiting the alley. These are illustrated in Figures 6.1 and 6.2.

![Figure 6.1 – MUTCD Sign R3-17](image1)

![Figure 6.2 – MUTCD Sign R15-8](image2)
Westrich is proposing to redevelop the site located at 11023-11045 86 Avenue in the Garneau neighbourhood of Edmonton. The site currently contains eight single-family lots and is zoned RF6. The proposed development concept includes 159 residential units; this concept requires a DC2 rezoning. Parking will be provided with an underground parkade accessed via the alley to the south.

A multi-modal transportation analysis was completed for the site and indicated that minimal transportation impacts are expected for the development. The observed traffic volumes on 110 and 111 Street are currently in the order of 100-200 vehicles in the peak hour on each street and projected to remain in this range once the development is built out. As a core neighbourhood, there are several multi-modal transportation facilities serving the area, including sidewalks, bike lanes, and transit routes. Some missing links in active transportation accommodation are expected to be added with the completion of the Garneau Neighbourhood Renewal project.

The parking requirements for the development were calculated based on the Transit Oriented Developments Overlay in the Edmonton Zoning Bylaw. Based on the current development concept, the parking requirement for the site is a minimum of 125 stalls to a maximum of 239 stalls; the current site design meets this requirement with a proposed 164 stalls. Based on the DC2 zoning, a minimum of 110 secured bicycle parking spaces should be provided.

No current alley operational issues were observed; however, due to the protected bike lanes running in the opposing direction as vehicular traffic on the one-way 110 and 111 Street, it is recommended to add additional signage and paint markings at the alley entrances to warn drivers exiting the alley to look both ways for bike traffic.