

1746 CARLING AVENUE

OTTAWA, ONTARIO

NOISE AND VIBRATION IMPACT STUDY

RWDI #2403794

September 5, 2025

SUBMITTED TO

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VERSION HISTORY

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2	September 5, 2025	Submitted for ZBA and SPA	Sohrab Yusefi	Khalid Hussein



EXECUTIVE SUMMARY

RWDI was retained to prepare a Noise and Vibration Impact Study for the proposed mixed-use development located at 1746 Carling Avenue in Ottawa, Ontario. The proposed development will consist of 3 buildings: (1) a 32-storey mixed use building, (2) a 28-storey mixed use building and (3) a 9-storey (seniors living) apartment building. This report considers the proposed development at full completion of all buildings. This assessment was completed to support the Zoning By-Law Amendment & Site Plan Control applications submission as required by the City of Ottawa.

The following noise control measures are recommended for the proposed development:

1. Installation of central air-conditioning so that all suites' windows can remain closed.
2. The inclusion of noise warning clauses related to:
 - a. Transportation sound levels at the building façade and in the outdoor amenity areas
 - b. Proximity to commercial/industrial land-use
3. Minimum sound isolation performance:
 - a. Suite bedroom window glazing with sound isolation performance up to STC-34.
 - b. Suite exterior balcony door with sound isolation performance up to STC-30.
4. Construction of perimeter noise barriers along the outdoor amenity areas if feasible, with the applicable warning clause.

Transportation sources with the potential to impact the proposed development include Highway traffic on Queensway south of the development and road traffic from Carling Avenue from West to East, Clyde and Cole Avenue to the east, Broadview to the west, and Dohney, Kerr, and Boyd Avenues to the South.

The potential noise levels from stationary sources of sound were evaluated. Based on the noise modeling results and setback distances, the applicable sound level limits are predicted to be exceeded during a worst-case hour due to surrounding commercial/retail and industrial facilities. However, the sound isolation required for ambient road level will ensure below the limit noise for indoor spaces.

At this stage in design the noise levels produced by the development on itself and its surroundings could not be quantitatively assessed. However, the effect on both the building itself and its surroundings is expected to be feasible to meet the applicable criteria. We recommend that the building design is evaluated prior to building permit to ensure that the acoustical design is adequately implemented in order to meet the applicable criteria.

Based on the results of the analysis, including implementation of the recommendations presented in this report, the proposed development is feasible with respect to noise and vibration.



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1 INTRODUCTION

RWDI was retained to prepare a Noise and Vibration Impact Study for the proposed mixed-use development located at 1746 Carling Avenue in Ottawa, Ontario. The proposed development will consist of 3 buildings: (1) a 32-storey mixed use building, (2) a 28-storey mixed use building and (3) a 9-storey (seniors living) apartment building. The development is expected to be built in three phases. This report considers the proposed development at full completion of all buildings.

This development is exposed to noise from both stationary and transportation sources. Stationary sources include equipment and activities associated with surrounding commercial and industrial uses. Transportation sources with the potential to impact the proposed development include Highway traffic on Queensway south of the development and road traffic from Carling Avenue from West to East, Clyde and Cole Avenue to the east, Broadview to the west, and Dohney, Kerr, and Boyd Avenues to the South.

This assessment was completed to support the Zoning By-Law Amendment & Site Plan Control applications with the City of Ottawa. This assessment was based on updated design drawings dated November 13, 2024. A copy of the drawings is included in **Appendix A**.

2 APPLICABLE CRITERIA

Applicable criteria for transportation noise sources (road and rail), stationary noise sources and rail vibration are adopted from the Ontario Ministry of the Environment, Conservation and Parks (MECP) NPC-300 Environmental Noise Guideline (MOE, 2013), with a summary of the applicable criteria included with **Appendix B**.

The proposed development site would be characterized as a "Class 1 Area", which is defined according to NPC-300 as an area with an acoustical environment typical of a major population center, where the background sound level is dominated by the activities of people, usually road traffic, often referred to as "urban hum."

3 THE EFFECTS OF THE ENVIRONMENT ON THE PROPOSED DEVELOPMENT

3.1 Transportation Source Assessment

3.1.1 Road Traffic Volume Data

The traffic data for all the roads and Queensway were calculated based on the Ottawa "Environmental Noise Control Guidelines version 2016," which provides max capacity for Annual Average Daily Traffic (AADT) for each road type. Based on the guideline provided, Queensway is considered an "8-lane highway" with an AADT of 146664. Carling Avenue is regarded as a "6-lane Urban Arterial Divided" with an AADT of 50,000. Rest of the minor streets and avenues are considered "2-lane Urban Collector" with an AADT of 8,000.



A summary of the guideline data used is included in **Table 1** below with more detailed information included in **Appendix C**.

Table 1: Road Traffic Volumes

Implied Roadway Class	Roadway Name	AADT	Posted Speed Km/Hr	% Day/Night	% Medium Trucks	% Heavy Trucks
Highway	Queensway	146,664	100	92% /8%	7	5
6-Lane Urban Arterial Divided	Carling Avenue	50,000	60	92% /8%	7	5
2-Lane Urban Collector	Doheny, Boyd, Kerr, Clyde, Cole, and Broadview Avenues	8,000	40	92% /8%	7	5

3.1.2 Representative Receptors

The selection of receptors affected by transportation noise sources was based on the drawings reviewed for this assessment. Using the “building evaluation” feature of Cadna/A, each façade of the residential buildings was assessed.

Outdoor Living Areas (OLAs) would include outdoor areas intended and designed for the quiet enjoyment of the outdoor environment and which are readily accessible from the building. OLAs may include any common outdoor amenity spaces associated with a multi-unit residential development (e.g., courtyards, roof-top terraces), and/or private backyards and terraces with a minimum depth of 4m provided they are the only outdoor living area for the occupant. Daytime sound levels were assessed at the following identified OLAs:

- OLA_01: Tower A (B1), Level 7 above grade amenity spaces
- OLA_02: Tower A (B1), Level 7 above grade amenity spaces
- OLA_03: Tower B (B2), Level 5 above grade amenity spaces
- OLA_04: Tower B (B2), Level 5 above grade amenity spaces
- OLA_05: Tower B (B2), Level 5 above grade amenity spaces

The OLAs are indicated in **Figure 2**.

3.1.3 Analysis and Results

Sound levels due to the adjacent roads were predicted using emission algorithms from the Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT) guidelines (MOE, 1989) implemented in the Cadna/A software package.

To assess the effect of transportation noise on suites, the maximum sound level on each façade was determined with the results summarized in **Table 2**.



Table 2: Predicted Ground Transportation Source Sound Levels – Plane of Window

Building	Façade	Road		Notes
		Day L _{EQ} , 16hr	Night L _{EQ} , 8hr	
Tower A (B1)	North	73 dBA	66 dBA	1
	East	72 dBA	65 dBA	1
	South	70 dBA	62 dBA	1
	West	70 dBA	62 dBA	1
Tower B (B2)	North	74 dBA	66 dBA	1
	East	70 dBA	63 dBA	1
	South	69 dBA	61 dBA	1
	West	71 dBA	63 dBA	1
Tower C (B3)	North	67 dBA	59 dBA	1
	East	70 dBA	62 dBA	1
	South	70 dBA	63 dBA	1
	West	67 dBA	60 dBA	1

Note(s):

1. The acoustical performance of building components must be specified to meet the indoor sound level criteria. Installation of air conditioning to allow for windows and doors to remain closed, warning clause “Type D.” Refer to **Appendix D** for guidance regarding air-conditioning as a noise mitigation measure.

To assess the effect of transportation noise on the qualifying OLAs for the development, predicted sound level results are summarized in **Table 3**.

Table 3: Transportation Sound Levels in Outdoor Living Areas (OLAs)

Receptor	Description	Daytime L _{EQ} , 16hr	Notes
OLA_01	Tower A (B1), Level 7 above grade amenity spaces	66 dBA	1
OLA_02	Tower A (B1), Level 7 above grade amenity spaces	67 dBA	1
OLA_03	Tower B (B2), Level 5 above grade amenity spaces	66 dBA	1
OLA_04	Tower B (B2), Level 5 above grade amenity spaces	65 dBA	1
OLA_05	Tower B (B2), Level 5 above grade amenity spaces	65 dBA	1

Note(s):

1. Noise mitigation is recommended to meet the ≤55 dBA OLA sound level criterion. If noise controls are not feasible to meet the 55 dBA criterion for technical, economic, or administrative reasons, an exceedance of 5 dB may be acceptable (to a maximum sound level of 60 dBA). In this case, a warning clause “Type B” is recommended.

3.2 Stationary Source Assessment

Stationary sources could be grouped into two categories: Those that have a permit with the Ontario Ministry of the Environment, Conservation and Parks (MECP) through an Environmental Compliance Approval (ECA) or Environmental Activity and Sector Registry (EASR); and those that are exempt from ECA or EASR permit requirements.

In the case where a stationary source has an Environmental Compliance Approval (ECA) or Environmental Activity and Sector Registry (EASR) permit with the MECP, and would be put in a position where it is no longer in compliance with the applicable sound level criteria due to the encroachment of the proposed new development, source specific mitigation and/or formal classification of the proposed development lands as a “Class 4 Area” (refer to C.4.4.2 “Class 4 Area” in NPC-300) would be required. In this case, coordination, and agreements between the stationary source owner, proposed new development owner, the land-use planning authority and potentially the MECP would be needed.

In the case where a stationary source is exempt from ECA or EASR permit requirements with the MECP, the noise provisions of the applicable Municipal Code / Noise By-Law and guidance from NPC-300 would be applicable. In this case, mitigation of sound levels due to stationary sources would be from a due diligence perspective to meet the sound level criteria in the local noise by-law, and to avoid nuisance complaints from future occupants of the proposed new development.

3.2.1 Stationary Source Modeling

RWDI conducted a screening level land-use compatibility assessment based on the guidance of the Ministry of the Environment D-6 Guideline (MOE, 1995a). Stationary sources of noise surrounding the proposed development were identified using a combination of source identification using publicly available aerial and street-level imagery, business listing, and the MECP Access Environment database.

The stationary source assessment includes all facilities within a 70 m radius of the proposed development and select facilities with a setback greater than 70 m with potential to influence sound levels at the proposed development (i.e., Class II facilities as per MECP’s D-6 Guidelines). There is no major industry (Class III) within 1000m. SAPUTO DAIRY PRODUCTS CANADA G.P, located approximately 300 m to the southeast of the proposed development, was identified as having potential to influence sound levels at the proposed development and was therefore the only permitted facility included in the assessment.

3.2.1.1 Representative Receptors

The worst-case receptor locations were assessed to evaluate the potential stationary source noise effects on the proposed development. Out of possible location of outdoor points of reception only those representing worst case scenario were used in evaluation. To evaluate noise at façade, the “building evaluation” feature of Cadna/A, was used to assess façade of the residential building.

3.2.1.2 Assumed Sources and Sound Power Levels

Stationary sources of noise surrounding the proposed development were identified using publicly available aerial imagery, street-level imagery, Ontario access environment registry, and review of the Ottawa development search.

RWDI proxy data were used for the sound power levels of the HVAC units, and idling trucks included in the model. The assumed sound power levels included in the screening level stationary source assessment are presented in



Table 4. The locations of the sources summarized in **Table 4** included in the stationary source assessment are illustrated in **Appendix E, Figure E.1.**

Table 4: Stationary Source Sound Power Level Assumptions

Source Description	Source ID (As shown in Figure F.1)	Proxy Data / Measurement	Sound Power Level (dBA)	Daytime and Evening (07:00h – 23:00h)	Nighttime (23:00h – 07:00h)
Residential HVACs	R_HVAC	Proxy Data	75	Continuous	50% Duty cycle
1-Fan HVAC Unit	HVAC_1F	Proxy Data	82	Continuous	50% Duty cycle
2-Fan HVAC Unit	HVAC_2F	Proxy Data	85	Continuous	50% Duty cycle
3-Fan HVAC Unit	HVAC_3F	Proxy Data	87	Continuous	50% Duty cycle
4-Fan HVAC Unit	HVAC_4F	Proxy Data	88	Continuous	50% Duty cycle
8-Fan HVAC Unit	HVAC_8F	Proxy Data	91	Continuous	50% Duty cycle
Make-Up Air Unit	MUA	Proxy Data	85	Continuous	50% Duty cycle
Air Impact Wrench	Wrench	Proxy Data	104	Quasi-impulsive	-
General Exhaust Fan	Exhaust	Proxy Data	78	Continuous	50% Duty cycle
Cooling Tower	CT	Proxy Data	100	Continuous	50% Duty cycle
Chiller	CH	Proxy Data	92	Continuous	50% Duty cycle
Truck Idling at docks	Idling_truck	Proxy Data	92.3	4 hours / day	-
Average Transport Truck	TR_avg	Proxy Data	104	5 trucks/hour	2 trucks/hour

The assumed sound power level values are done conservatively assuming everything except for trucks operates 24/7.

3.2.1.3 Elevated Background Sound Levels

As road traffic is dominant in this area, elevated background sound levels due to road noise were calculated to account for the busy roadways in the area.

Traffic volumes for the quietest daytime and nighttime hour were assumed to be 2.5% and 0.2% of the AADT for daytime and night-time respectively, according to the typical hourly traffic distribution, published by the Institute of Traffic Engineers (ITE, 2010). Traffic volumes were not grown to a horizon year for the purpose of background sound level calculations. The AADT used for this calculation is based on Turning Movement Count On three junctions of Dohney/Kerr, Carling/Broadview, and Carling/Clyde/Cole. The AADT for Queensway was calculated based on the Ottawa "Environmental Noise Control Guidelines version 2016,". The Queensway is considered to be running at maximum capacity. The data from transport Ontario (iCorridor) approves the assumption. A summary of the guideline data used in ambient calculations is included in **Table 5.**



Based on the traffic volumes for the quietest daytime and nighttime hours, sound levels were predicted by inputting sound emission data using the ORNAMENT (MOE, 1989) algorithms as line sources in the Cadna/A software package.

Table 5: Road Traffic Volumes for Ambient Noise Calculations

Roadway Name	AADT	Posted Speed Km/Hr	% Day/Night	% Medium Trucks	% Heavy Trucks
Queensway	146,664	100	92% /8%	7	5
Carling Avenue	28,633	60	92% /8%	1	1.7
Clyde Avenue	9,922	40	92% /8%	1.3	2.1
Cole Avenue	4,162	40	92% /8%	0.5	0.8
Broadview Avenue_North	6,811	40	92% /8%	0.5	0.8
Broadview Avenue_South	3,500	40	92% /8%	0.6	0.9
Boyd Avenue - North	1,200	40	92% /8%	1	1.6
Boyd Avenue - South	918	40	92% /8%	1.5	2.3
Dohney Avenue	2,378	40	92% /8%	0.8	1.2
Kerr Avenue	3,033	40	92% /8%	0.8	1.3

Background sound levels were predicted at all points of the façade using the “building evaluation” feature of Cadna/A and each outdoor point of reception. The stationary noise at each point of the façade and OPORs was compared to the Environmental noise guideline (NPC-300) sound limits, and elevated background noise and exceedance were calculated for every point separately. The worst-case scenarios are reported in **Table 6**.

3.2.1.4 Stationary Source Results

Stationary source noise modelling was carried out using the Cadna/A software package, a commercially available implementation of the ISO 9613 (ISO, 1994 and ISO, 1996) algorithms. The predicted sound levels are assessed against the elevated noise limits (refer to **Appendix A**).

The worst-case receptors are considered the locations on the proposed development buildings that experience the highest sound level from stationary sources relative to the background sound level (i.e., high stationary source impact, low background sound level). These are presented in **Table 6**. The elevated background noise varies on each façade based on the floor elevation (Lower stories are predicted to experience higher ambient noise than higher stories) and is presented by range. Point by Point façade evaluation in CadnaA was used to check compliance with the criteria.



Table 6: Predicted Sound Levels at Worst-Case Receptor Locations – Continuous Stationary Sources

Building/Receptor	Façade	Predicted Sound Level		Applicable Criteria ^[3]	Meets Criteria? (Daytime / Nighttime) ^[4]
		Daytime-Evening 0700-2300h (dBA)	Nighttime 2300-0700h ^[1] (dBA)	Daytime / Nighttime L _{EQ-1hr} (dBA)	
Tower A (B1)	N	54	51	50-64 ^[2] / 45-53 ^[2]	No / No
	E	56	53	63-65 ^[2] / 52-54 ^[2]	Yes / No
	S	52	49	61-65 ^[2] / 50-54 ^[2]	Yes / Yes
	W	47	44	59-63 ^[2] / 48-52 ^[2]	Yes / Yes
Tower B (B2)	N	52	49	58-64 ^[2] / 46-53 ^[2]	Yes / No
	E	49	47	59-64 ^[2] / 47-53 ^[2]	Yes / Yes
	S	49	46	56-65 ^[2] / 45-54 ^[2]	Yes / Yes
	W	50	45	54-61 ^[2] / 45-50 ^[2]	Yes / Yes
Tower C (B3)	N	51	47	54-60 ^[2] / 45-49 ^[2]	Yes / No
	E	53	49	63-66 ^[2] / 52-56 ^[2]	Yes / Yes
	S	53	50	60-66 ^[2] / 49-55 ^[2]	Yes / Yes
	W	50	46	60-61 ^[2] / 49-50 ^[2]	Yes / Yes
OPOR_B1	-	47	- ^[1]	62 ^[2] / -- dBA	Yes
OPOR_B2	-	51	- ^[1]	60 ^[2] / -- dBA	Yes

1. Outdoor areas are not assessed during the nighttime period.
2. Elevated Limits applied from background transportation sound level calculations.
3. The lowest and highest predicted sound level on façade due to background transportation.
4. Point by Point façade evaluation in CadnaA was used to check compliance with the criteria.

As shown in **Table 6**, the daytime-evening and nighttime continuous sound levels at the sound levels at the façade due to existing stationary sources are predicted to meet and/or exceed the applicable sound level criteria, which is based on background noise modelling of transportation sources from Section 3.2.1.3. This indicates that the current background levels are greater than the NPC-300 Class 1 levels for urban areas, but that the current cumulative commercial contributions may exceed the quietest hour.

With respect to the modeled permitted facility at Saputo Dairy (located at 861 Clyde Avenue), the sound contribution from this location alone meets the NPC-300 stationary source limits for daytime and nighttime hours. Therefore, the proposed development is not expected to encroach on the compliance of Saputo Dairy.

Generally, the contributions from the considered stationary noise sources are insignificant considering the future contributions from transportation sources, which are predicted to have noise levels greater than 70 dBA for daytime hours, and 60 dBA for nighttime hours. The levels due to the transportation sources required that the



building elements be specified with specific sound transmission classes and ventilation causes to address noise, which will be sufficient to address the contributions from the stationary noise sources.

3.3 Recommendations

Based on the noise and results, the following recommendations were determined for the project. Recommendations are provided for both transportation sources and stationary sources.

3.3.1 Transportation Sources

The following recommendations are provided to address transportation sources.

3.3.1.1 Building Façade Components

Due to the elevated transportation sound levels in the area, acoustical design of the façade components including spandrel, window glazing, and exterior doors, are recommended to be specified for the proposed development.

To assess the development’s feasibility, preliminary window glazing, and exterior balcony door sound isolation requirements were determined. These were based on following assumptions:

- Typical residential living room:
 - Glazing 60% of façade, Door: 20% of façade
 - 55% Façade to floor area Ratio
- Typical residential bedroom:
 - Glazing 80% of façade, Door: N/A
 - 81% Façade to floor area Ratio
- Acoustical character of rooms: High absorption finishes/furniture for bedrooms and intermediate absorption finishes/furniture for living rooms.

Based on the predicted plane of window sound levels and the assumptions listed above, recommendations for the minimum sound insulation ratings for the building components were determined using the National Research Council of Canada “BPN-56 method” (NRCC, 1985). The reported results are in terms of Sound Transmission Class (STC) ratings as summarized in **Table 7**.

Table 7: Recommended Façade Component Minimum Sound Insulation Rating

Portion of Development	Façade	Window Glazing	Exterior Door	Façade Wall
Tower A (B1)	North Façade	STC 34	STC-28	STC-45
	East Façade	STC 32	STC-28	STC-45
	South Façade	STC 29	STC-28	STC-45
	West Façade	STC-29	STC-28	STC-45
Tower B (B2)	North Façade	STC-34	STC-30	STC-45
	East Façade	STC 29	STC-28	STC-45



Portion of Development	Façade	Window Glazing	Exterior Door	Façade Wall
	South Façade	STC-28	STC-28	STC-45
	West Façade	STC-31	STC-28	STC-45
Tower C (B3)	North Façade	STC-26	STC-28	STC-45
	East Façade	STC-29	STC-28	STC-45
	South Façade	STC-29	STC-28	STC-45
	West Façade	STC-26	STC-28	STC-45

The maximum requirement for the window glazing was determined to be STC-34, and STC-30 for the exterior door, which is considered feasible as this can be achieved by various double-glazed configurations of insulated glazing units.

Taking into account the assumptions used as a basis to determine the glazing requirements, the applicable indoor transportation source sound level criteria are predicted to be achieved. This is a preliminary analysis to determine feasibility of the development, examining the worst-case on each façade and corner. As the building design progresses and details about glazing area, room size and specific unit layout are determined the analysis should be updated and considerations to optimize the STC requirements across the buildings can be made.

We recommend that the façade construction is reviewed during detailed design to ensure that the indoor sound level limits will be met, and that the window/door supplier is requested to provide STC laboratory test reports as part of shop drawing submittal to confirm that the glazing/door components will meet the minimum STC requirements.

3.3.1.2 Ventilation Recommendations

Due to the transportation sound levels at the plane of the façade, central air conditioning is recommended for the proposed development to allow for windows and doors to remain closed as a noise mitigation measure. Further, prospective purchasers or tenants should be informed by a warning clause “Type D”.

3.3.1.3 Outdoor Living Areas

Due to exposure to transportation sources along the nearby roads Carling, Clyde, Cole, Broadview, Dohney, Kerr, Boyd Avenues, and Queensway, levels in OLAs are predicted to be elevated. The road daytime average sound levels for the OLAs included in the assessment are in the range of 64-65 dBA. Noise barriers are recommended to reduce the transportation sound levels in OLAs to meet the applicable criteria.

The recommended geometry of the noise barriers is included with **Figure 3a** (to meet 55 dBA) and **Figure 3b** (to meet 60 dBA). The barrier heights are summarized in **Table 8**. General guidance with respect to noise barrier design is included with **Appendix D**.



Table 8: Barrier Height Recommendations for OLAs

Receptor	Description	Predicted OLA Sound Level	Barrier Height (m) to Meet Sound Level Criterion	
		Daytime $L_{EQ, 16hr}$	≤ 55 dBA ¹	≤ 60 dBA ²
OLA_01	Tower A (B1), Level 7 above grade amenity spaces	66 dBA	4.5 m	2 m
OLA_02	Tower A (B1), Level 7 above grade amenity spaces	67 dBA	4.5 m	2 m
OLA_03	Tower B (B2), Level 5 above grade amenity spaces	66 dBA	4.5 m	2 m
OLA_04	Tower B (B2), Level 5 above grade amenity spaces	65 dBA	4.5 m	2 m
OLA_05	Tower B (B2), Level 5 above grade amenity spaces	65 dBA	4.5 m	2 m

Note(s):

1. Refer to Figure 3a for barrier geometry to meet 55 dBA.
2. Refer to Figure 3b for barrier geometry to meet 60 dBA. A warning clause “Type B” is recommended in cases where the OLA sound level is >55 dBA (to a maximum of 60 dBA).

3.3.2 Stationary Sources

The noise modeling results show a limited excess of the NPC-300 limits based on the analysis of elevated background levels due to traffic. Since these excess sound levels are due to the cumulative effect of numerous facilities that are not subject to MECP permitting, an NPC-300 Type E Warning Clause is recommended as noise from adjacent industrial/commercial land-uses may at times be audible.

The recommendation for central air conditioning (Section 3.3.1.2) further allows for residents to address potential noise from Stationary Sources by allowing windows to be closed.

3.3.3 Warning Clauses

The following warning clauses are recommended for the proposed development:

1. NPC-300 Type A or B to address transportation sound levels in Outdoor Living Areas (OLAs)
2. NPC-300 Type C or D to address transportation sound levels at the plane of window
3. NPC-300 Type E to address proximity to commercial/industrial facilities

Warning clauses are must be included on all development agreements, offers of purchase and agreements of purchase and sale or lease. The wording of the recommended warning clauses is included with **Appendix G**.

4 THE EFFECTS OF THE PROPOSED DEVELOPMENT ON ITS SURROUNDINGS AND ON ITSELF

On-site stationary sources for the development are expected to consist of HVAC related equipment in the roof-top mechanical penthouse as well as various exhaust fans. Further, consideration should be given to control airborne and structure-borne noise generated within the proposed development.

Within the development itself the main sources of noise that are likely to affect the uses of the building are the mechanical systems. The potential noise effect of the commercial component of the development is recommended to be reviewed during detailed design, to ensure the applicable criteria will be met.

Provided that best practices for the acoustical design of the building are followed, noise from building services equipment associated with the development are expected to be feasible to meet the applicable sound level criteria due to the nature (residential/mixed-use) of the proposed development.

We recommend that the potential noise effect of the proposed development is reviewed during detailed design to ensure the applicable sound level criteria will be achieved.

5 CONCLUSIONS

RWDI was retained to prepare a Noise and Vibration Impact Study for the proposed mixed-use development located at 1746 Carling Avenue in Ottawa, Ontario.

The following noise control measures are recommended for the proposed development:

1. Installation of central air-conditioning so that all suites' windows can remain closed.
2. The inclusion of noise warning clauses related to:
 - a. Transportation sound levels at the building façade and in the outdoor amenity areas
 - b. Proximity to commercial/industrial land-use
3. Minimum sound isolation performance:
 - a. Suite bedroom window glazing with sound isolation performance up to STC-34.
 - b. Suite exterior balcony door with sound isolation performance up to STC-30.
4. Construction of perimeter noise barriers along the outdoor amenity areas if feasible, with the applicable warning clause.

At this stage in design the noise levels produced by the development on itself and its surroundings could not be quantitatively assessed. However, the effect on both the building itself and its surroundings is expected to be feasible to meet the applicable criteria. We recommend that the building design is evaluated prior to building permit to ensure that the acoustical design is adequately implemented in order to meet the applicable criteria.

The potential noise levels from stationary sources of sound were evaluated. Based on the noise modeling results and setback distances, the applicable sound level limits are predicted to be exceeded during a worst-case hour due to surrounding commercial/retail and industrial facilities. However, the sound isolation required for ambient road level will ensure below the limit noise for indoor spaces.

Based on the results of the analysis, including implementation of the recommendations presented in this report, the proposed development is feasible with respect to noise and vibration.



6 REFERENCES

1. Ontario Ministry of the Environment (MOE), August 2013, Publication NPC-300, Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning (MOE, 2013).
2. Ontario Ministry of the Environment and Energy (MOE), 1993, Publication NPC-216, Residential Air Conditioning Devices (MOE, 1993).
3. Ontario Ministry of the Environment (MOE), 1989, ORNAMENT Ontario Road Noise Analysis Method for Environment and Transportation, Technical Publication (MOE, 1989)
4. Ontario Ministry of the Environment (MOE) Publication Guideline D-6, “Compatibility Between Industrial Facilities and Sensitive Land Uses”, July 1995 (MOE, 1995).
5. Controlling Sound Transmission into Buildings (BPN-56), National Research Council Canada (NRCC, 1985).
6. Institute of Transportation Engineers (ITE), 2010, *Traffic Engineering Handbook, 6th Edition* (ITE, 2010)
7. International Organization for Standardization (ISO), 1994b, International Standard ISO 9613-1:1994, Acoustics – Attenuation of Sound during propagation outdoors. Part 1: Calculation of the absorption of sound by the atmosphere. (ISO, 1994)
8. International Organization for Standardization (ISO), 1996, International Standard ISO 9613-2:1996, Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation (ISO, 1996)
9. Ontario Ministry of the Environment (MOE), 1978, Model Municipal Noise Control Bylaw, which includes Publication NPC-103 – Procedures, and Publication NPC-104 – Sound Level Adjustments.



7 STATEMENT OF LIMITATIONS

This report entitled 1746 Carling Avenue was prepared by Rowan Williams Davies & Irwin Inc. ("RWDI") for The Properties Group Management Ltd. ("Client"). The findings and conclusions presented in this report have been prepared for the Client and are specific to the project described herein ("Project"). The conclusions and recommendations contained in this report are based on the information available to RWDI when this report was prepared.

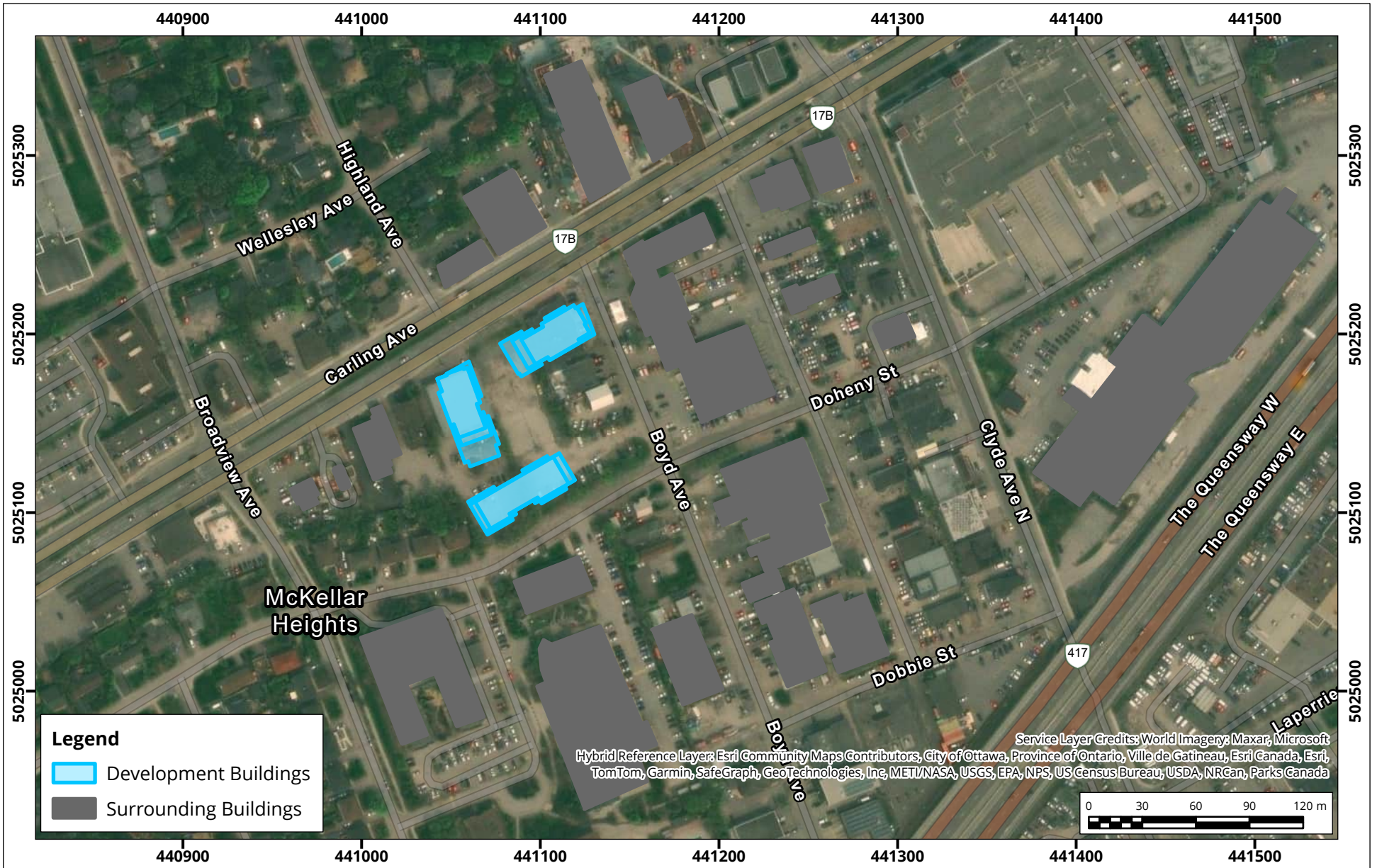
Because the contents of this report may not reflect the final design of the Project or subsequent changes made after the date of this report, RWDI recommends that it be retained by Client during the final stages of the project to verify that the results and recommendations provided in this report have been correctly interpreted in the final design of the Project.

The conclusions and recommendations contained in this report have also been made for the specific purpose(s) set out herein. Should the Client or any other third party utilize the report and/or implement the conclusions and recommendations contained therein for any other purpose or project without the involvement of RWDI, the Client or such third party assumes any and all risk of any and all consequences arising from such use and RWDI accepts no responsibility for any liability, loss, or damage of any kind suffered by Client or any other third party arising therefrom.

Finally, it is imperative that the Client and/or any party relying on the conclusions and recommendations in this report carefully review the stated assumptions contained herein and to understand the different factors which may impact the conclusions and recommendations provided.

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FIGURES



Site Context Plan

Map Projection: NAD 1983 UTM Zone 18N
1746 Carling Ave, Ottawa, ON



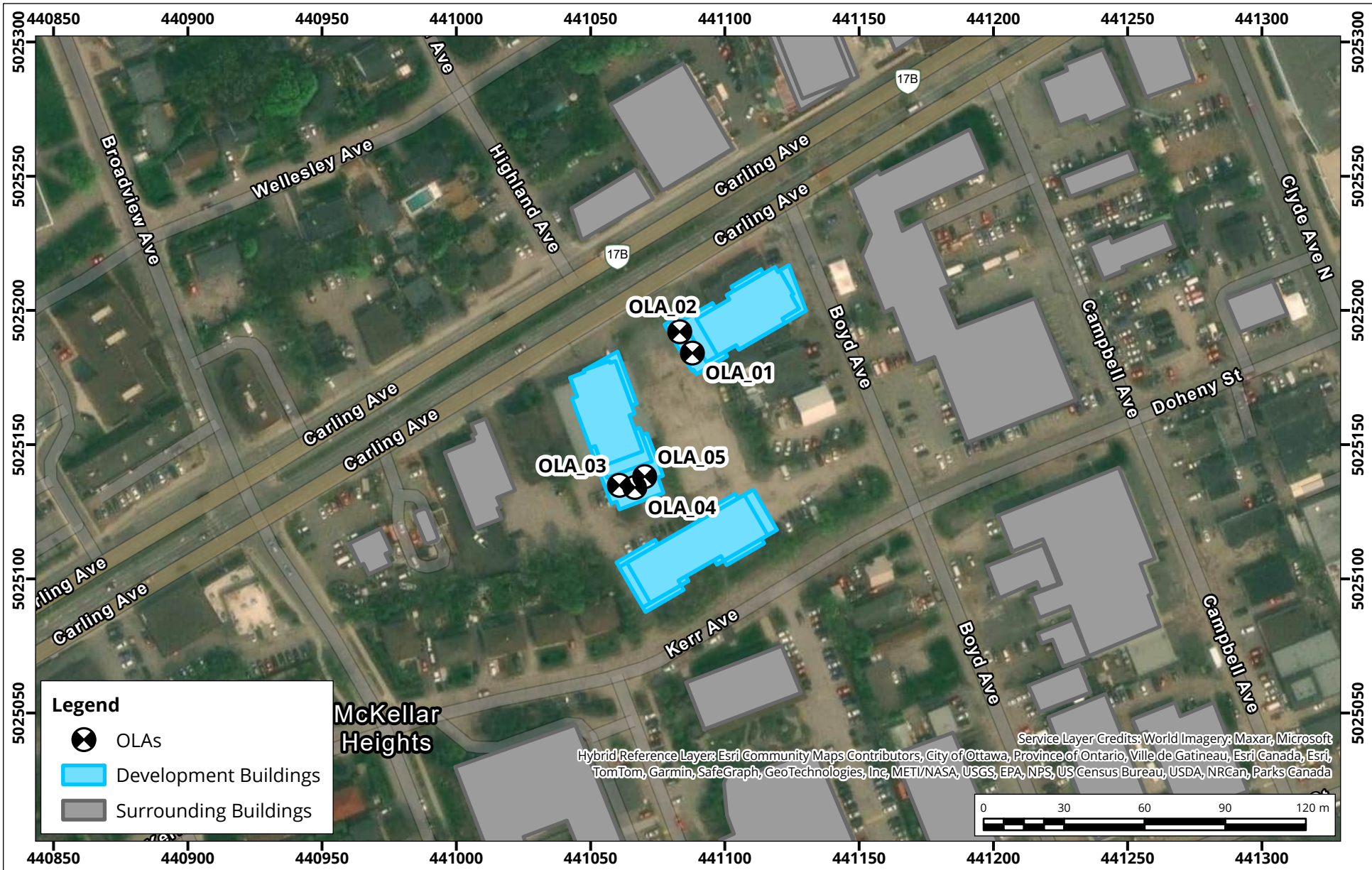
Drawn by: SY Figure: 1

Approx. Scale: 1:3,000

Date Revised: Feb 12, 2025

Project #: 2403794





Outdoor Living Areas (OLAs) Noise Barrier Locations Location of Common Outdoor Amenity Areas

Map Projection: NAD 1983 UTM Zone 18N
1746 Carling Ave, Ottawa, ON



Drawn by: SY Figure: 2

Approx. Scale: 1:2,000

Date Revised: Feb 12, 2025



Project #: 2403794



Outdoor Living Areas (OLAs) Mitigation to 55 dBA Recommended Barrier Geometry and Height to meet 55 dBA

Map Projection: NAD 1983 UTM Zone 18N
 1746 Carling Ave, Ottawa, ON



Drawn by: SY | Figure: 3.1

Approx. Scale: 1:1,000

Date Revised: Feb 12, 2025



Project #: 2403794



Outdoor Living Areas (OLAs) Mitigation to 60 dBA Recommended Barrier Geometry and Height to meet 60 dBA

Map Projection: NAD 1983 UTM Zone 18N
1746 Carling Ave, Ottawa, ON



True North

Drawn by: SY Figure: 3.2

Approx. Scale: 1:1,000

Date Revised: Feb 12, 2025

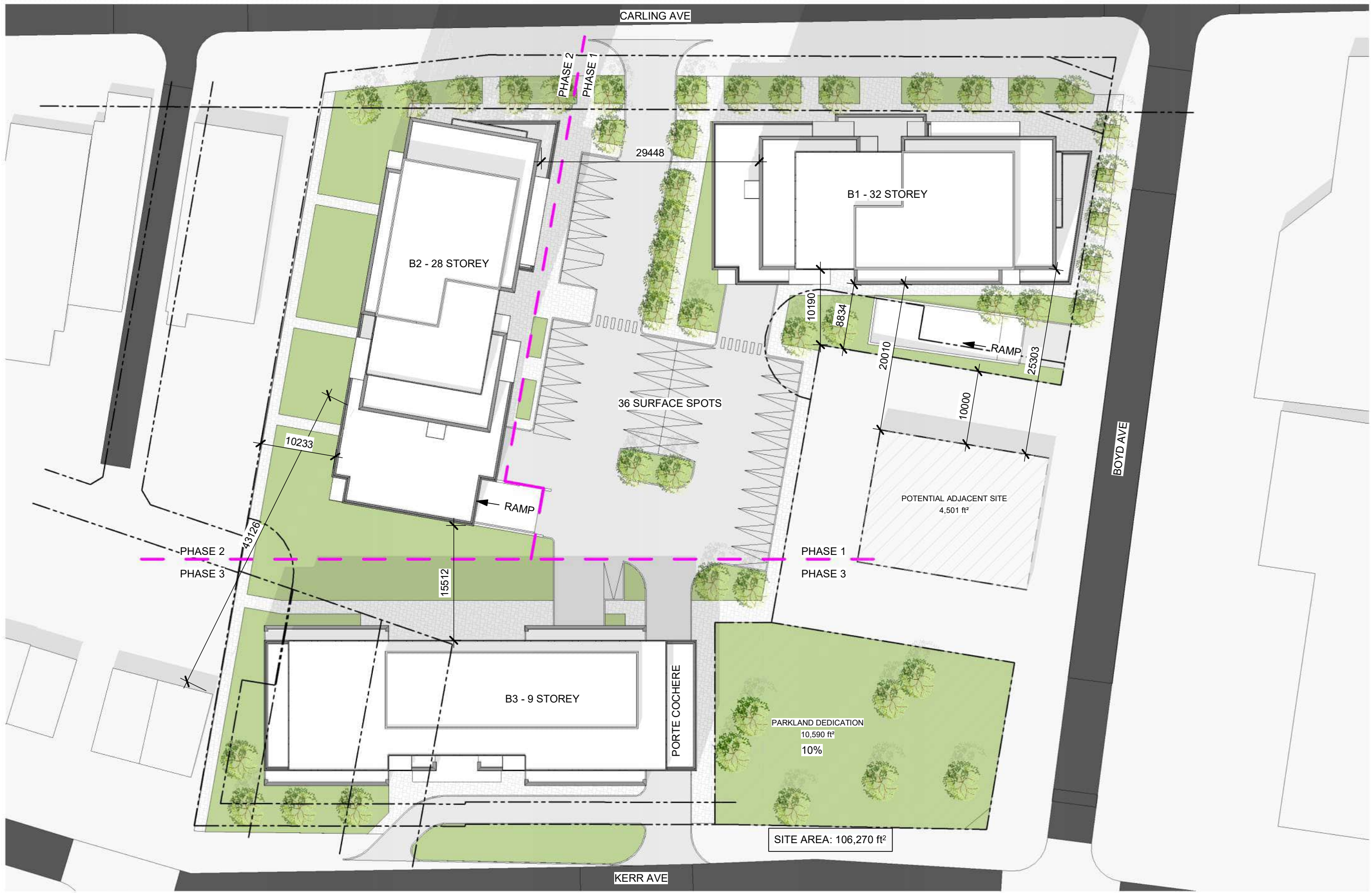


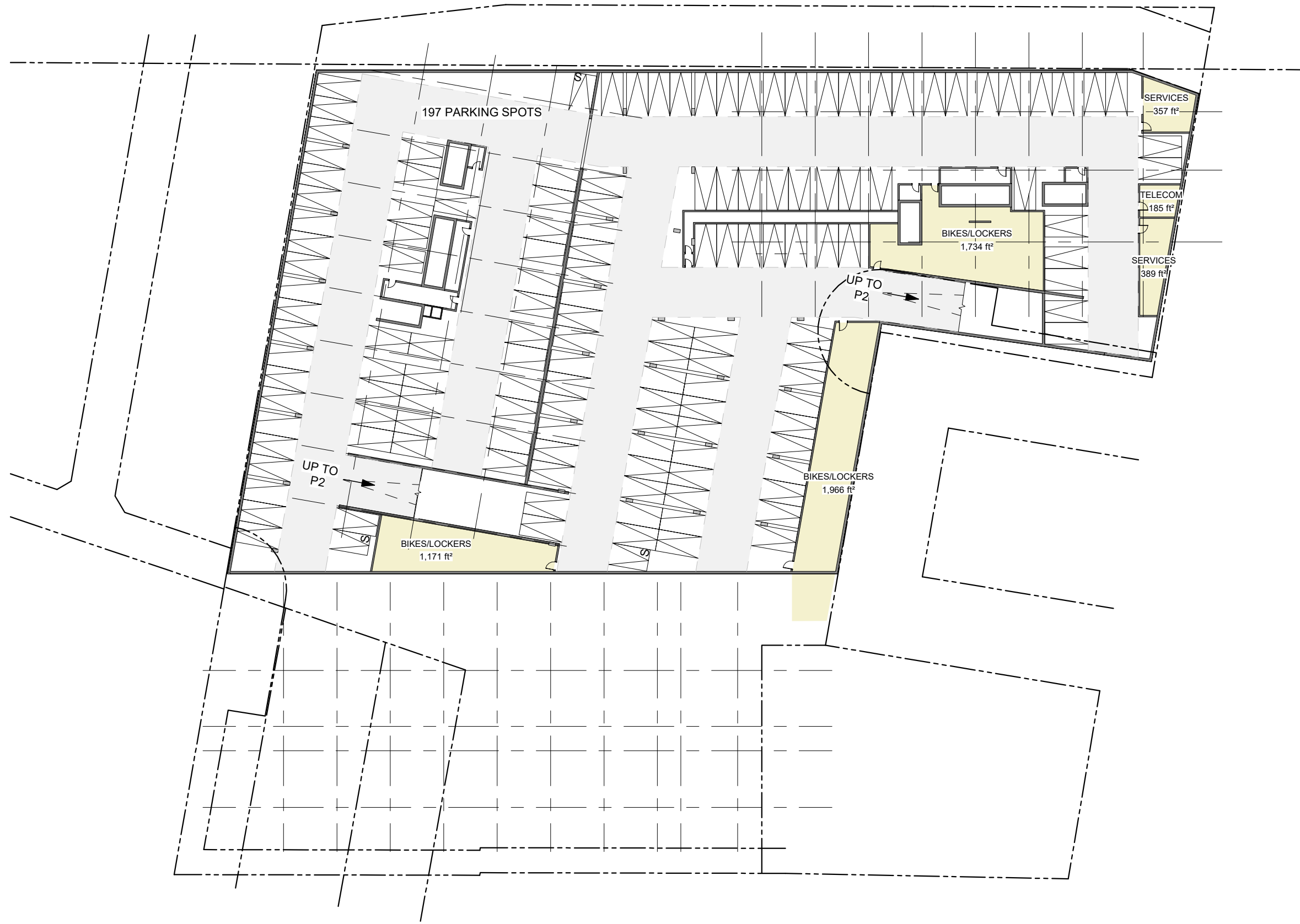
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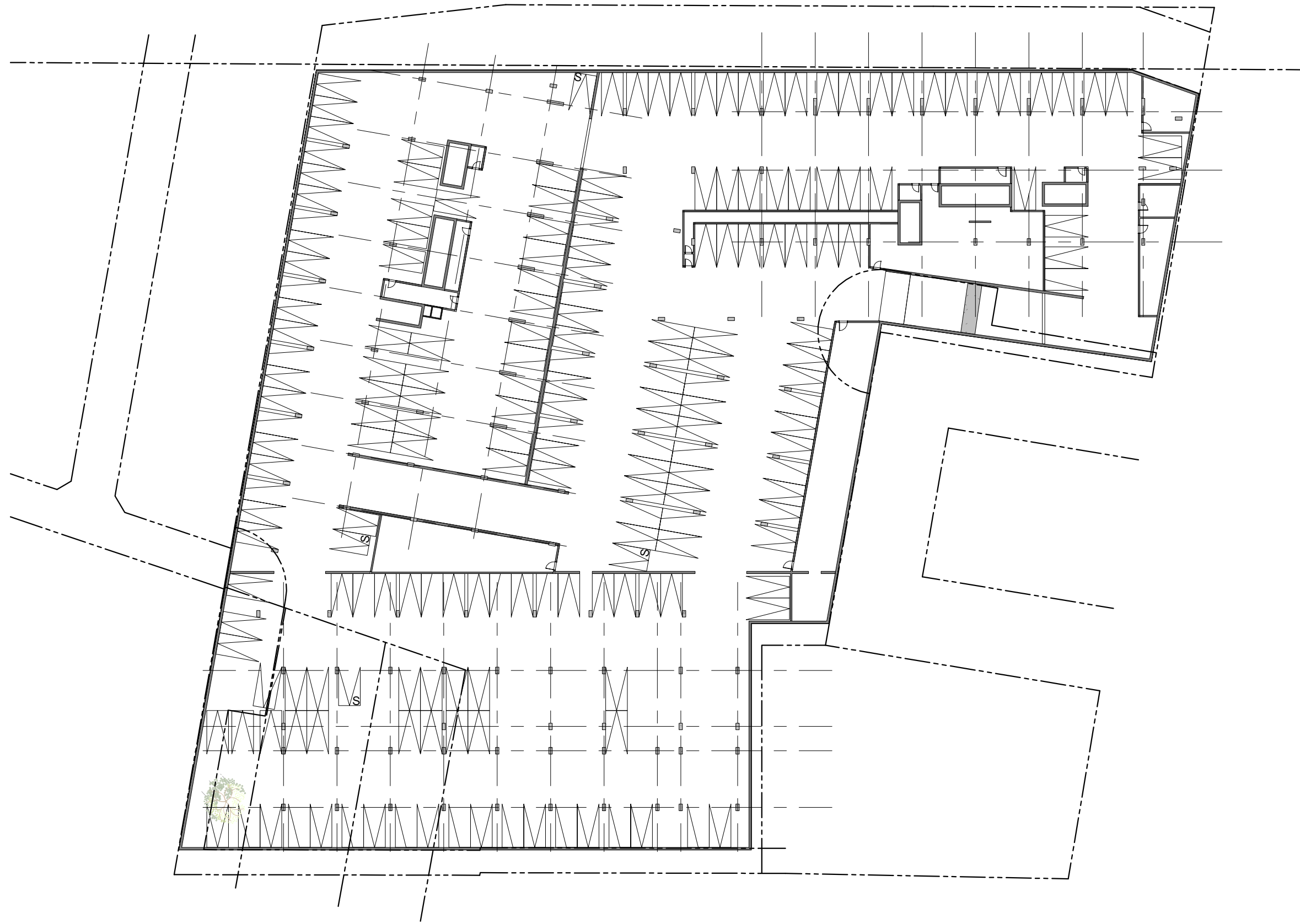
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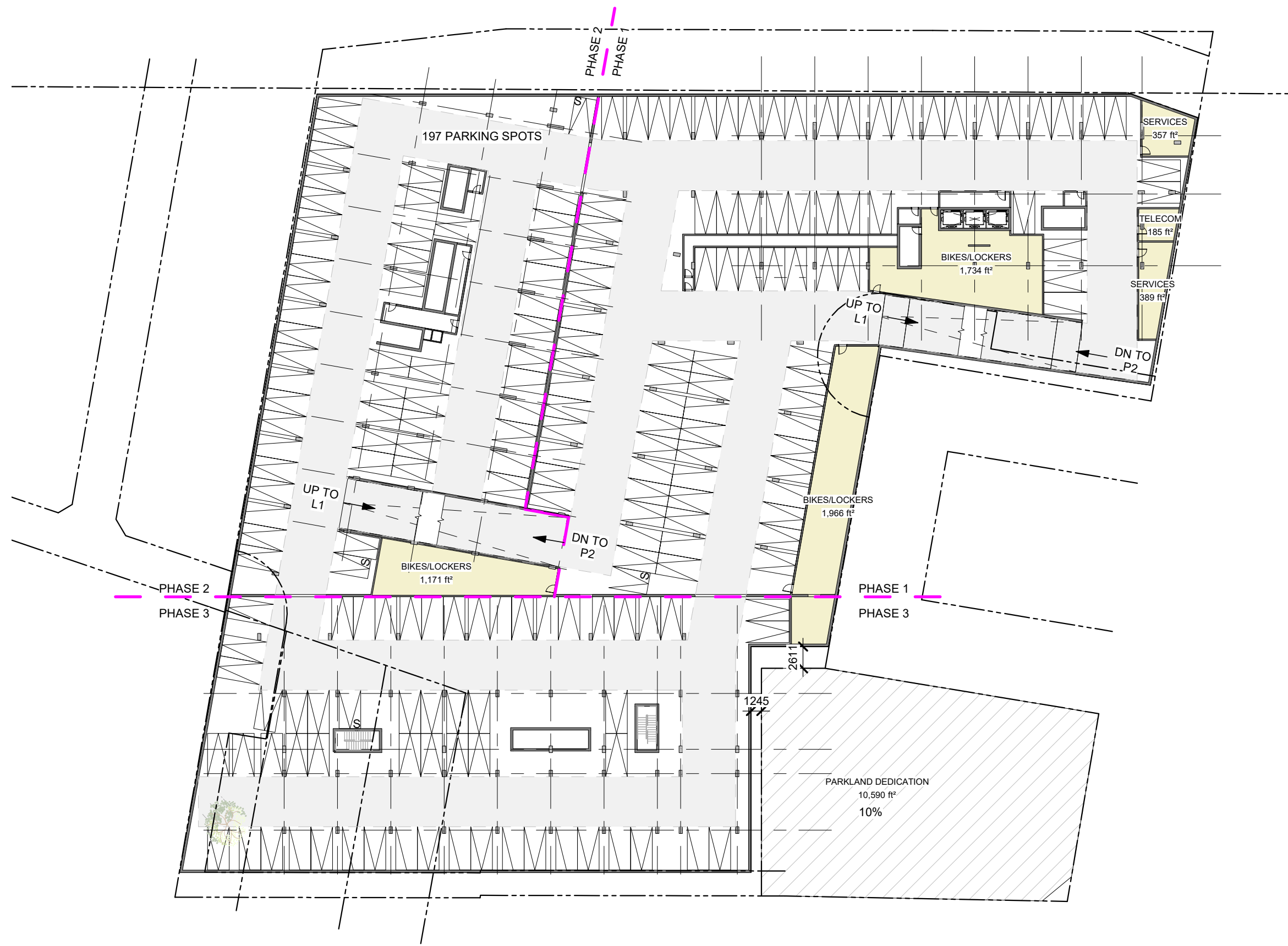
APPENDIX A

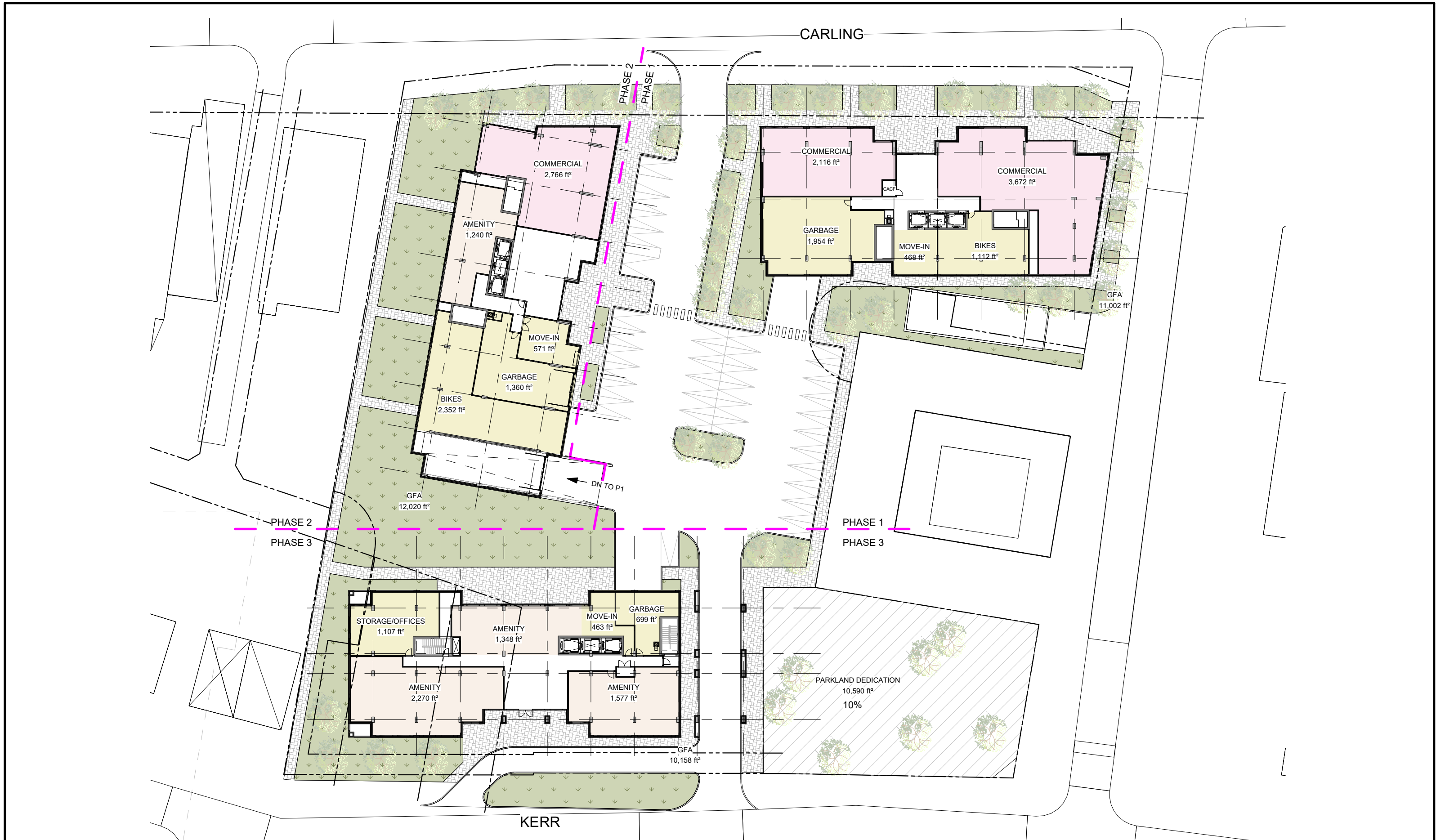




















LEVEL 9-24 FLOOR PLAN

SCALE: 1 : 500

DATE: 2024-11-13



1746 CARLING AVENUE

OTTAWA

ONTARIO



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RIB

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CARLING AVE.

rla / architecture

NORTH BUILDING ELEVATIONS - CARLING AVE.

SCALE: 1 : 500

DATE: 2024-11-13

1746 CARLING AVENUE

OTTAWA

ONTARIO

 THE
PROPERTIES
GROUP

DRAWN BY
RIB

SHEET #
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PROJ. No. 2210













rla / architecture

PERSPECTIVE VIEW

SCALE:

DATE: 2024-11-13

1746 CARLING AVENUE

OTTAWA

ONTARIO

 THE PROPERTIES GROUP

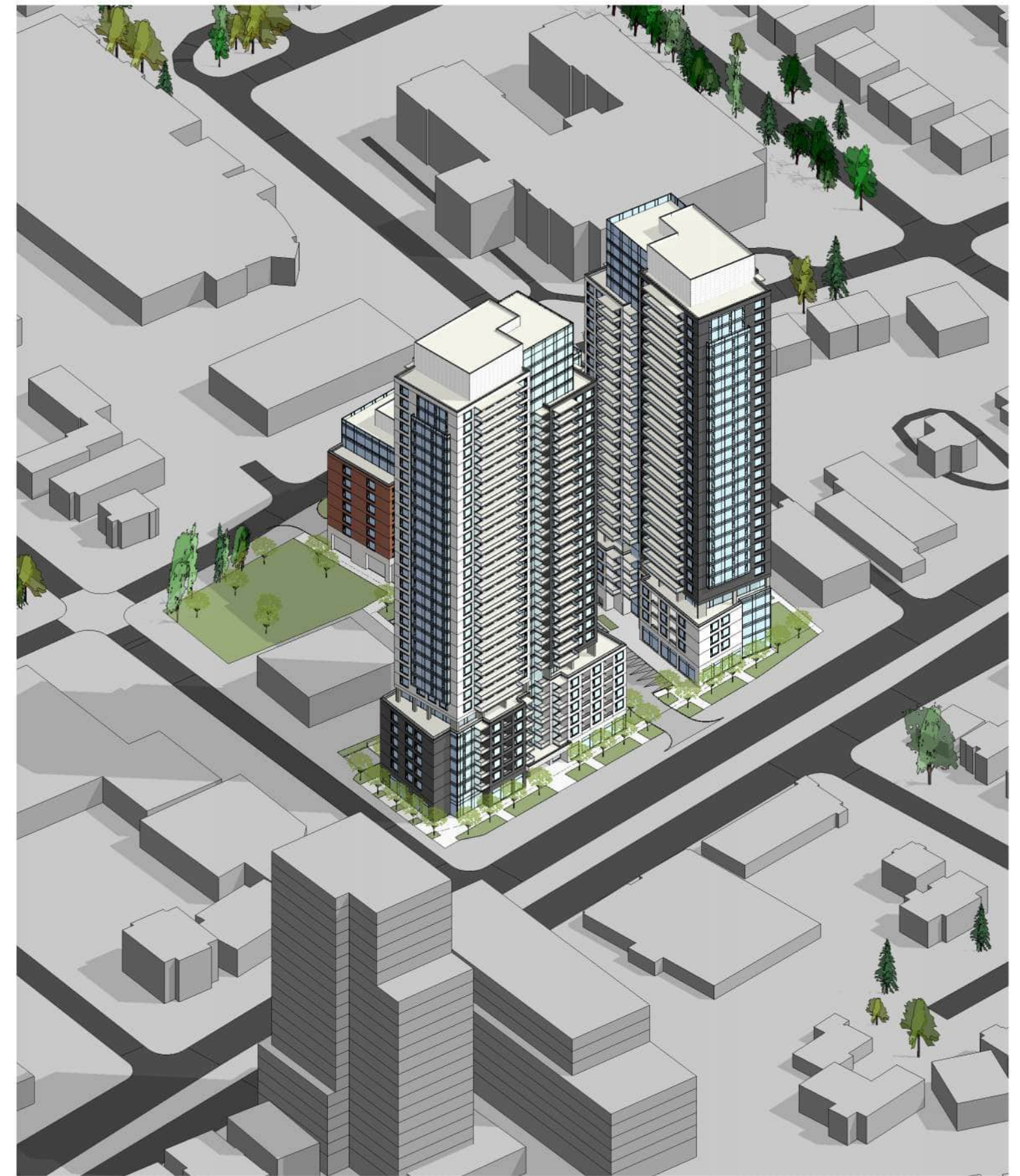
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rla / architecture

AERIAL VIEW

SCALE:

DATE: 2024-11-13

1746 CARLING AVENUE

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APPENDIX B

CRITERIA

Transportation Sources

Guidance from the Ontario Ministry of the Environment, Conservation and Parks (MECP) NPC-300 Environmental Noise Guideline was used to assess environmental noise generated by transportation-related sources. There are three aspects to consider, which include the following:

- i. Transportation source sound levels in indoor living areas (living rooms and sleeping quarters), which determines building façade elements (windows, exterior walls, doors) sound insulation design recommendations.
- ii. Transportation source sound levels at the plane of the window, which determines air-conditioning and ventilation system recommendations and associated warning clauses which inform the future occupants that windows and doors must be closed in order to meet the indoor sound level criteria.
- iii. Transportation source sound levels in Outdoor Living Areas (OLAs), which determines OLA noise mitigation and related warning clause recommendations.

Road and Rail

Indoor Sound Level Criteria

For assessing sound originating from transportation sources, NPC-300 defines sound level criteria as summarized in **Table 1** for indoor areas of sensitive uses. The specified values are maximum sound levels and apply to the indicated indoor spaces with the windows and doors closed.

Table 1: Indoor Sound Level Criteria for Road and Rail Sources

Type of Space	Source	Sound Level Criteria (Indoors)	
		Daytime Leq,16-hr 07:00h – 23:00h	Nighttime Leq,8-hr 23:00h – 07:00h
Living Quarters Examples: Living, dining and den areas of residences, hospitals, nursing homes, schools and daycare centres	Road	45 dBA	
	Rail	40 dBA	
Sleeping Quarters	Road	45 dBA	40 dBA
	Rail	40 dBA	35 dBA

NPC-300 also provides guidelines for acceptable indoor sound levels that are extended to land uses and developments which are not normally considered noise sensitive. The guideline sound level criteria presented in **Table 2** are provided to inform good-practice design objectives.

Table 2: Supplementary Indoor Sound Level Criteria for Road and Rail Sources

Type of Space	Source	Sound Level Criteria (Indoors)	
		Daytime $L_{eq,16-hr}$ 07:00h – 23:00h	Nighttime $L_{eq,8-hr}$ 23:00h – 07:00h
General offices, reception areas, retail stores, etc.	Road	50 dBA	-
	Rail	45 dBA	-
Theatres, places of worship, libraries, individual or semi-private offices, conference rooms, reading rooms, etc.	Road	45 dBA	-
	Rail	40 dBA	-
Sleeping quarters of residences, hospitals, nursing/retirement homes, etc.	Road	-	40 dBA
	Rail	-	35 dBA
Sleeping quarters of hotels/motels	Road	-	45 dBA
	Rail	-	40 dBA

Outdoor Living Areas (OLAs)

Outdoor Living Areas (OLAs) would include outdoor areas intended and designed for the quiet enjoyment of the outdoor environment and which are readily accessible from the building.

OLAs may include any common outdoor amenity spaces associated with a multi-unit residential development (e.g. courtyards, roof-top terraces), and/or private backyards and terraces with a minimum depth of 4m provided they are the only outdoor living area for the occupant. The sound level criteria for outdoor living areas is summarized in **Table 3**.

Table 3: Sound Level Criteria – Outdoor Living Area

Assessment Location	Sound Level Criteria (Outdoors)	
	Daytime $L_{eq,16-hr}$ 07:00h – 23:00h	Nighttime $L_{eq,8-hr}$ 23:00h – 07:00h
Outdoor Living Area (OLA) (Combined Road and Rail)	55 dBA	-

Outdoor and Plane of Window Sound Levels

In addition to the sound level criteria, noise control measures and requirements for ventilation and warning clauses requirements are recommended for residential land-uses based on predicted transportation source sound levels incident in the plane of window at bedrooms and living/dining rooms, and/or at outdoor living areas. These recommendations are summarized in **Table 4** below.

Table 4: Ventilation, Building Component, and Warning Clauses Recommendations for Road/Rail Sources

Assessment Location	Transportation Sound Level (Outdoors)		Recommendations
	Daytime $L_{eq,16-hr}$ 07:00h – 23:00h	Nighttime $L_{eq,8-hr}$ 23:00h – 07:00h	
Plane of Window (Road)	> 65 dBA	> 60 dBA	<p>Installation of air conditioning to allow windows to remained closed.</p> <p>The sound insulation performance of building components must be specified and designed to meet the indoor sound level criteria.</p> <p>Warning clause “Type D” is recommended.</p>
	> 55 dBA	> 50 dBA	<p>Applicable for low and medium density development: Forced-air ventilation system to allow for the future installation of air-conditioning. Warning clause “Type C” is recommended.</p> <p>Applicable for high density development: Air conditioning to allow windows to remained closed. Warning clause “Type D” is recommended.</p>
Plane of Window (Rail ^{1,2})	> 60 dBA	> 55 dBA	<p>The acoustical performance of building façade components should be specified such that the indoor sound level limits are predicted to be achieved.</p> <p>Warning clause “Type D” is recommended.</p>
	> 60 dBA ($L_{eq,24hr}$) and < 100m from tracks		<p>Exterior walls consisting of a brick veneer or masonry equivalent for the first row of dwellings.</p> <p>Warning clause “Type D” is recommended.</p>
Outdoor Living Area (Combined Road and Rail ³)	<p>\leq 60 dBA</p> <p>> 55 dBA</p>	-	<p>If sound levels are predicted to exceed 55 dBA, but are less than 60 dBA, noise controls may be applied to reduce the sound level to 55 dBA.</p> <p>If noise control measures are not provided, a warning clause “Type A” is recommended.</p>
	> 60 dBA	-	<p>Noise controls (barriers) should be implemented to meet the 55 dBA criterion.</p> <p>If mitigation is not feasible to meet the 55 dBA criterion for technical, economic or administrative reasons, an exceedance of 5 dB may be acceptable (to a maximum sound level of 60 dBA). In this case a warning clause “Type B” would be recommended.</p>

Note(s):

1. Whistle noise is included (if applicable) in the determination of the sound level at the plane of window.
2. Some railway companies (e.g. CN, CP) may require that the exterior walls include a brick veneer or masonry equivalent for the façade facing the railway line, regardless of the sound level.
3. Whistle noise is not included in the determination of the sound level at the OLA.

Rail Layover Sites

NPC-300 provides a sound level limit for rail layover sites to be the higher of the background sound level or 55 dBA $L_{eq,1-hr}$, for any one-hour period.

Rail Vibration Criteria

An assessment of rail vibration is generally recommended for developments within 75m of a rail corridor or rail yard, and adjacent to or within a setback of 15m of a transit (subway or light-rail) rail line.

GO, Freight, VIA Train

The generally accepted vibration criterion for sensitive land-uses is the threshold of perception for human exposure to vibration, being a vibration velocity level of 0.14 mm/s RMS in any one-third octave band centre frequency in the range of 4 Hz to 200 Hz.

This vibration criterion is based on a one-second exponential time-averaged maximum hold root-mean-square (RMS) vibration velocity level and is consistent with the Railway Associations of Canada (RAC, 2013) guideline, and the U.S. Federal Transit Authority (FTA, 2018) criterion for residential land-uses.

TTC Streetcar/Subway

If the predicted rms vertical vibration velocity from the Line exceeds 0.1 mm/sec, mitigation methods shall be applied during the detailed design to meet this criterion to the extent technologically, economically, and administratively feasible.

This vibration criterion is based on a one-second exponential time-averaged maximum hold root-mean-square (RMS) vibration velocity level and is consistent with the Toronto Transit Commission (TTC) guidelines for the assessment of potential vibration impact of future expansion (MOEE/TTC, 1993).

Aircraft

Land-use compatibility in the vicinity of airports is addressed in Ministry of the Environment, Conservation, and Parks (MECP) Guideline NPC-300 (MOE, 2013). The guideline provides recommendations for ventilation, and noise control for different Noise Exposure Forecast (NEF) values, which would be based on NEF contour maps available from the airport authority. The NEF values can be expressed as $L_{A,eq,24hr}$ sound levels by using the expression $NEF = L_{Aeq,24hr} - 32$ dBA.

Table 5: Indoor Sound Level Criteria for Aircraft Sources

Assessment Location	Indoor Sound Level Criteria NEF ($L_{eq, 24hr}$) ¹
Living/dining/den areas of residences, hospitals, schools, nursing/retirement homes, daycare centres, etc.	NEF- 5 (37 dBA)
Sleeping quarters	NEF-0 (32 dBA)

NPC-300 also provides guidelines for acceptable indoor sound levels that are extended to land uses and developments which are not normally considered noise sensitive. The guideline sound level criteria presented in **Table 6** are provided to inform good-practice design objectives.

Table 6: Supplementary Indoor Sound Level Criteria for Aircraft Sources

Assessment Location	Indoor Sound Level Criteria ¹
General offices, reception areas, retail stores, etc.	NEF-15 (47 dBA)
Individual or semi-private offices, conference rooms, etc.	NEF-10 (42 dBA)
Sleeping quarters of hotels/motels, theatres, libraries, places of worship, etc.	NEF-5 (37 dBA)

Table 7: NPC-300 Sound Level Criteria for Aircraft (Outdoors)

Assessment Location	Outdoor Sound Level Criteria ¹
Outdoor areas, including OLA	NEF-30 (62 dBA)

Table 8: Ventilation, Building Component, and Warning Clauses Recommendations for Aircraft Sources

Assessment Location	Aircraft Sound Level	NPC-300 Requirements
	NEF (L _{EQ,24-hr})	
Outdoors	≥ NEF 30	Air conditioning to allow windows to remained closed. The sound insulation performance of building components must be specified and designed to meet the indoor sound level criteria. Warning clauses “Type D” and “Type B” are recommended.
	< NEF 30 ≥ NEF 25	The sound insulation performance of building components must be specified and designed to meet the indoor sound level criteria. Applicable for low and medium density development: Forced-air ventilation system to allow for the future installation of air-conditioning. Warning clause “Type C” is recommended. Applicable for high density development: Air conditioning to allow windows to remained closed. Warning clause “Type D” is recommended.
	< NEF 25	Further assessment not required

Stationary Sources

NPC-300 Sound Level Criteria – Stationary Sources

Guidance from the MECP NPC-300 Environmental Noise Guideline is used to assess environmental noise generated by stationary sources, for example industrial and commercial facilities.

Noise from stationary sources is treated differently from transportation sources and requires sound levels be assessed for the predictable worst-case one-hour average sound level (L_{eq}) for each period of the day. For assessing sound originating from stationary sources, NPC-300 defines sound level criteria for two types of Points of Reception (PORs): outdoor and plane of window.

Continuous Sources – Regular Operations

The assessment criteria for all PORs is the higher of either the exclusion limit per NPC-300 or the minimum background sound level that occurs or is likely to occur at a POR. The applicable exclusion limit is determined based on the level of urbanization or “Class” of the area. The NPC-300 exclusion limits for continuously operating stationary sources are summarized in **Table 9**.

Table 9: NPC-300 Exclusion Limits – Continuous and Quasi-Steady Impulsive Stationary Sources (LAeq-1hr)

Time Period	Class 1 Area		Class 2 Area		Class 3 Area		Class 4 Area	
	Outdoor	Plane of Window	Outdoor	Plane of Window	Outdoor	Plane of Window	Outdoor	Plane of Window
Daytime 0700-1900h	50 dBA	50 dBA	50 dBA	50 dBA	45 dBA	45 dBA	55 dBA	60 dBA
Evening 1900-2300h	50 dBA	50 dBA	45 dBA	50 dBA	40 dBA	40 dBA	55 dBA	60 dBA
Nighttime 2300-0700h	--	45 dBA	--	45 dBA	--	40 dBA	--	55 dBA

Note(s):

1. The applicable sound level criterion is the background sound level or the exclusion limit, whichever is higher.
2. Class 1, 2 and 3 sound level criteria apply to a window that is assumed to be open.
3. Class 4 area criteria apply to a window that is assumed closed. Class 4 area requires formal designation by the land-use planning authority.

Continuous Sources - Emergency Equipment Testing

Sound level criteria for emergency backup equipment (e.g. generators) operating in non-emergency situations such as testing or maintenance are 5 dB greater than the applicable sound level criteria for stationary sources.

In addition, the operation of emergency equipment under maintenance and testing conditions is assessed separately from all other stationary noise sources.

Impulsive Sources

For impulsive sound, other than quasi-steady impulsive sound, from a stationary source, the sound level criteria at a POR is expressed in terms of the Logarithmic Mean Impulse Sound Level (L_{LM}). As with the continuous noise sources, the assessment criteria for all PORs is the higher of either the exclusion limit per NPC-300 or the minimum background sound level that occurs or is likely to occur at a POR.

A summary of the exclusionary sound level limits is summarized in **Table 10**.

Table 10: NPC-300 Exclusion Limits - Impulsive Stationary Sources (LM)

Time Period	Number of Impulses in Period of 1-Hour	Class 1 and 2 Areas		Class 3 Areas		Class 4 Areas	
		Outdoor	Plane of Window	Outdoor	Plane of Window	Outdoor	Plane of Window
Daytime (0700-2300h)	9 or more	50 dBAI	50 dBAI	45 dBAI	45 dBAI	55 dBAI	60 dBAI
Nighttime (2300-0700h)		-	45 dBAI	-	40 dBAI	-	55 dBAI
Daytime (0700-2300h)	7 to 8	55 dBAI	55 dBAI	50 dBAI	50 dBAI	60dBAI	65 dBAI
Nighttime (2300-0700h)		-	50 dBAI	-	45 dBAI	-	60 dBAI
Daytime (0700-2300h)	5 to 6	60 dBAI	60 dBAI	55 dBAI	55 dBAI	65 dBAI	70 dBAI
Nighttime (2300-0700h)		-	55 dBAI	-	50 dBAI	-	65 dBAI
Daytime (0700-2300h)	4	65 dBAI	65 dBAI	60 dBAI	60 dBAI	70 dBAI	75 dBAI
Nighttime (2300-0700h)		-	60 dBAI	-	55 dBAI	-	70 dBAI
Daytime (0700-2300h)	3	70 dBAI	70 dBAI	65 dBAI	65 dBAI	75 dBAI	80 dBAI
Nighttime (2300-0700h)		-	65 dBAI	-	60 dBAI	-	75 dBAI
Daytime (0700-2300h)	2	75 dBAI	75 dBAI	70 dBAI	70 dBAI	80 dBAI	85 dBAI
Nighttime (2300-0700h)		-	70 dBAI	-	65 dBAI	-	80 dBAI
Daytime (0700-2300h)	1	80 dBAI	80 dBAI	75 dBAI	75 dBAI	85 dBAI	90 dBAI
Nighttime (2300-0700h)		-	75 dBAI	-	70 dBAI	-	85 dBAI

Note(s):

- The applicable sound level criterion is the background sound level or the exclusion limit, whichever is higher.

D-Series Guidelines

The MECP D-series guidelines (MOE, 1995) provide direction for land use planning to maximize compatibility of industrial uses with adjacent land uses. The goal of Guideline D-6 is to minimize encroachment of sensitive land uses on industrial facilities and vice versa, in order to address potential incompatibility due to adverse effects such as noise, odour and dust.

For each class of industry, the guideline provides an estimate of potential influence area and states that this influence area shall be used in the absence of the recommended technical studies. Guideline D-6 also recommends a minimum separation distance between each class of industry and sensitive land uses (see **Table 11**). Section 4.10 of D-6 identifies exceptional circumstances with respect to redevelopment, infill and mixed-use areas. In these cases, the guideline suggests that separation distances at, or less than, the recommended minimum separation distance may be acceptable if a justifying impact assessment is provided.

Table 11: Summary of Guideline D-6

Industry Class	Definition	Potential Influence Area ^[1]	Recommended Minimum Separation Distance ^[1]
Class I	Small scale, self-contained, daytime only, infrequent heavy vehicle movements, no outside storage.	70 m	20 m
Class II	Medium scale, outdoor storage of wastes or materials, shift operations and frequent heavy equipment movement during the daytime.	300 m	70 m
Class III	Large scale, outdoor storage of raw and finished products, large production volume, continuous movement of products and employees during daily shift operations.	1000 m	300 m

Note(s):

1. Measured from Property Line to Property Line.

Guideline D-6 provides criteria for classifying industrial land uses, based on their outputs, scale of operations, processes, schedule and intensity of operations. **Table 12** provides the classification criteria and examples.

Table 12: Guideline D-6 Industrial Categorization Criteria

Criteria	Class I	Class II	Class III
Outputs	<ul style="list-style-type: none"> • Sound not audible off property • Infrequent dust and/ or odour emissions and not intense • No ground-borne vibration 	<ul style="list-style-type: none"> • Sound occasionally audible off property • Frequent dust and/ or odour emissions and occasionally intense • Possible ground-borne vibration 	<ul style="list-style-type: none"> • Sound frequently audible off property • Persistent and intense dust and/ or odour emissions • Frequent ground-borne vibration
Scale	<ul style="list-style-type: none"> • No outside storage • Small scale plant or scale is irrelevant in relation to all other criteria 	<ul style="list-style-type: none"> • Outside storage permitted • Medium level of production 	<ul style="list-style-type: none"> • Outside storage of raw and finished products • Large production levels
Process	<ul style="list-style-type: none"> • Self-contained plant or building which produces / stores a packaged product • Low probability of fugitive emissions 	<ul style="list-style-type: none"> • Open process • Periodic outputs of minor annoyance • Low probability of fugitive emissions 	<ul style="list-style-type: none"> • Open process • Frequent outputs of major annoyances • High probability of fugitive emissions
Operation / Intensity	<ul style="list-style-type: none"> • Daytime operations only • Infrequent movement of products and/or heavy trucks 	<ul style="list-style-type: none"> • Shift operations permitted • Frequent movements of products and/or heavy trucks with majority of movements during daytime hours 	<ul style="list-style-type: none"> • Continuous movement of products and employees • Daily shift operations permitted
Examples	<ul style="list-style-type: none"> • Electronics Manufacturing • Furniture refinishing • Beverage bottling • Auto parts • Packaging services • Dairy distribution • Laundry and linen supply 	<ul style="list-style-type: none"> • Magazine printing • Paint spray booths • Metal command • Electrical production • Dairy product manufacturing • Feed packing plant 	<ul style="list-style-type: none"> • Paint and varnish manufacturing • Organic chemicals manufacturing • Breweries • Solvent recovery plant • Soap manufacturing • Metal manufacturing

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APPENDIX C

Turning Movement Count - Study Results

BOYD AVE @ DOHENY ST/KERR AVE

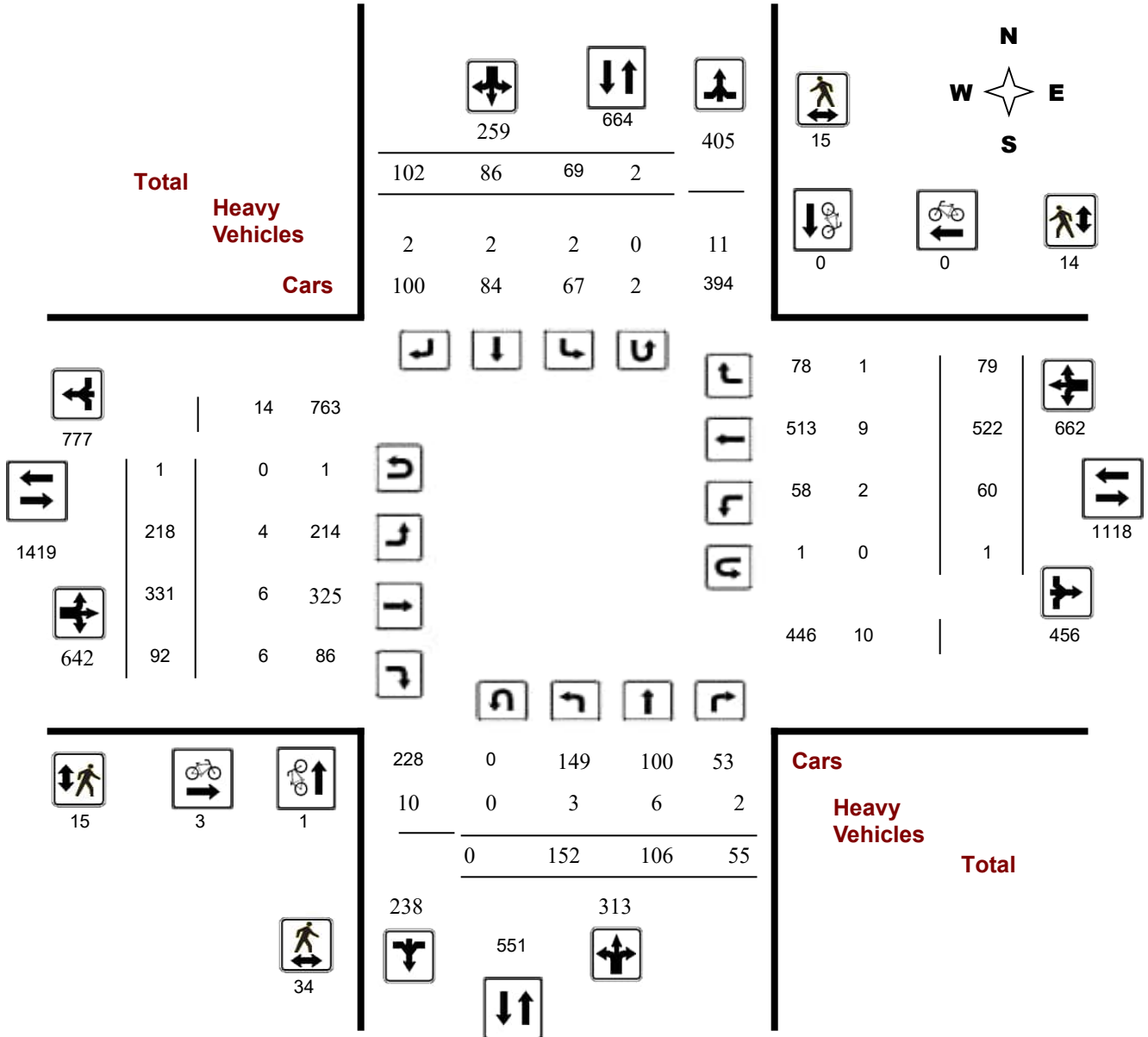
Survey Date: Thursday, December 07, 2023

WO No: 41352

Start Time: 07:00

Device: Miovision

Full Study Diagram



Turning Movement Count - Study Results

BOYD AVE @ DOHENY ST/KERR AVE

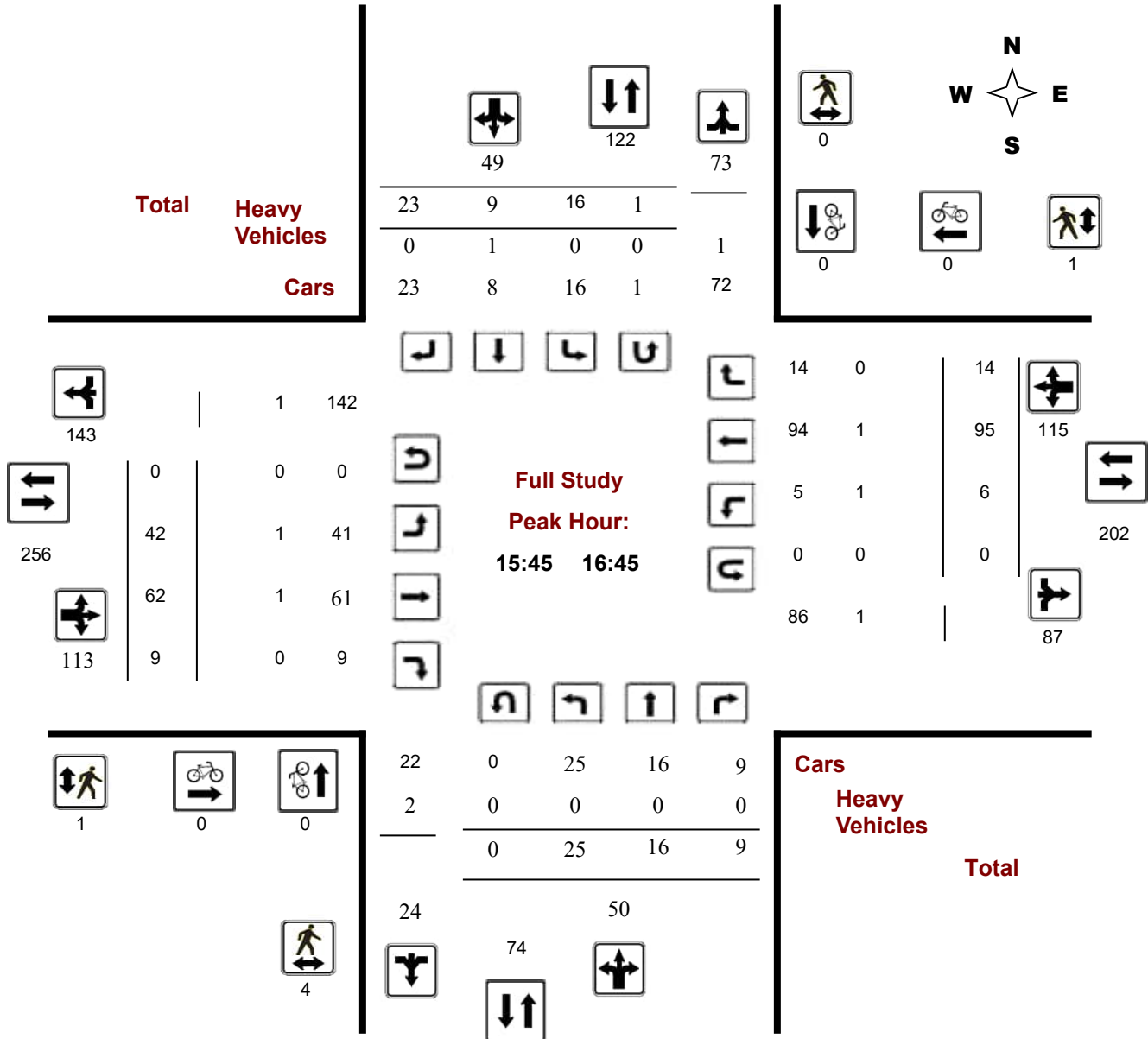
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WO No: 41352

Start Time: 07:00

Device: Miovision

Full Study Peak Hour Diagram



Turning Movement Count - Peak Hour Diagram

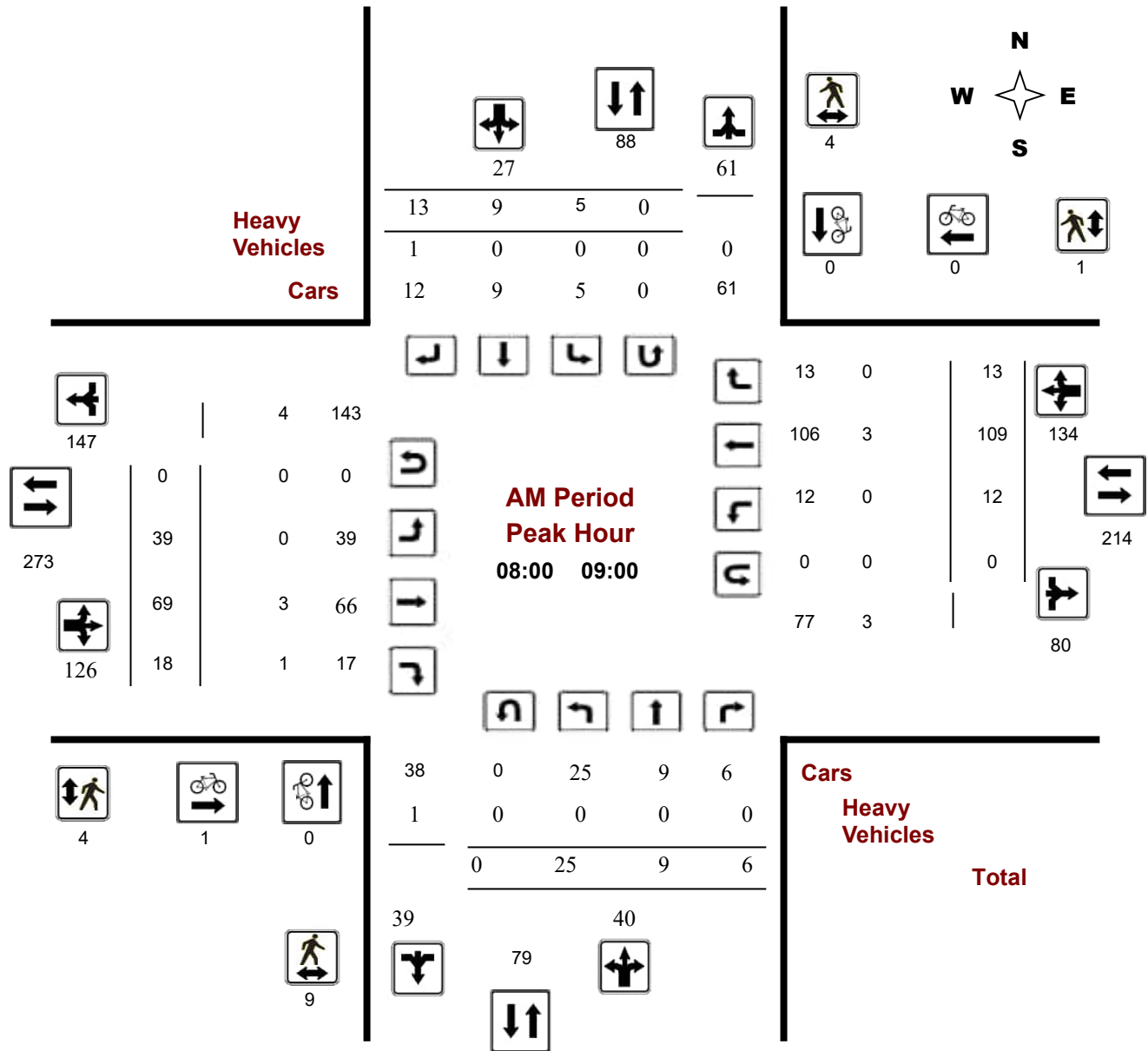
BOYD AVE @ DOHENY ST/KERR AVE

Survey Date: Thursday, December 07, 2023

Start Time: 07:00

WO No: 41352

Device: Miovision



Comments



Transportation Services - Traffic Services

Turning Movement Count - Peak Hour Diagram

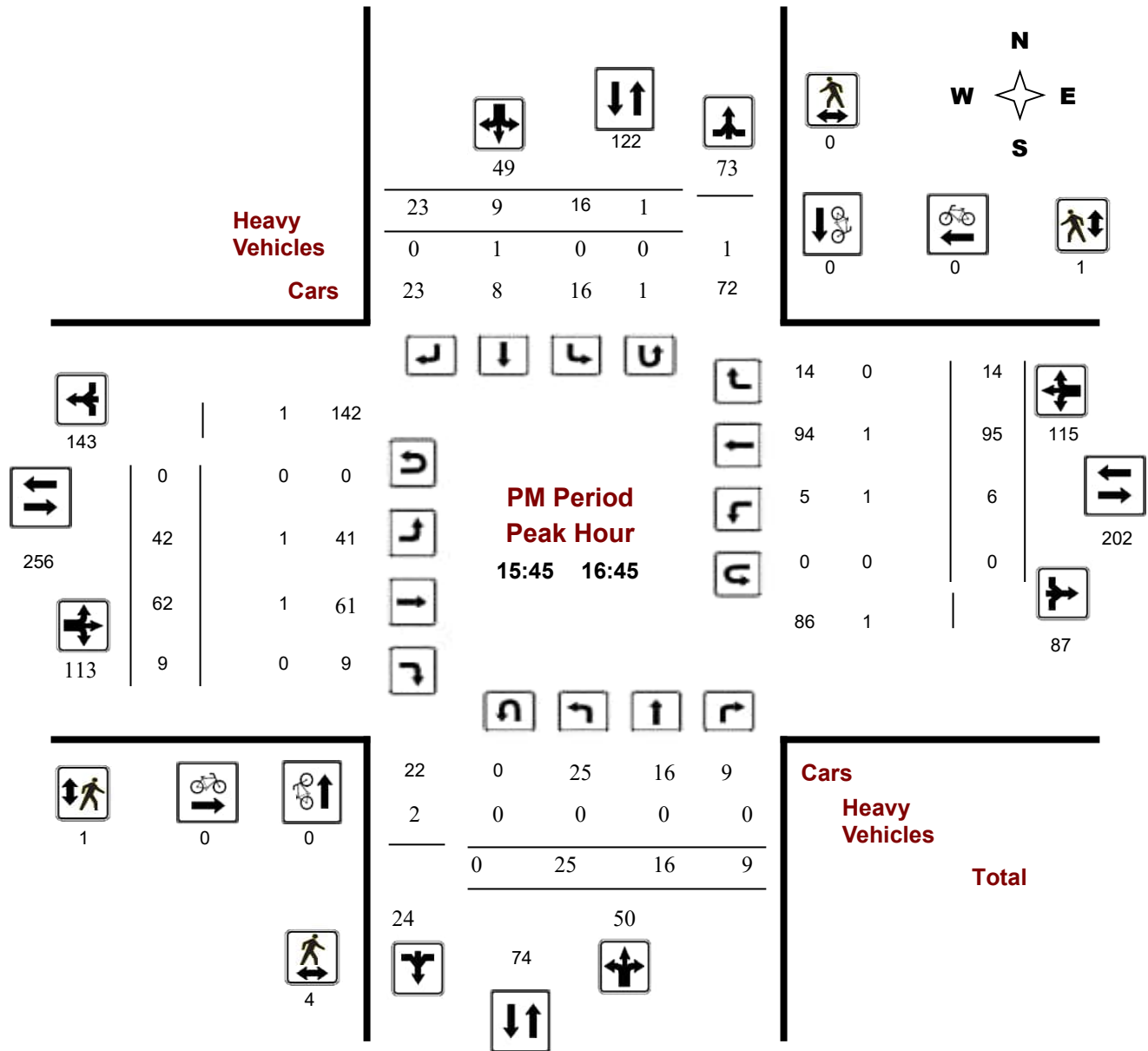
BOYD AVE @ DOHENY ST/KERR AVE

Survey Date: Thursday, December 07, 2023

Start Time: 07:00

WO No: 41352

Device: Miovision



Comments



Transportation Services - Traffic Services

Turning Movement Count - Study Results

BOYD AVE @ DOHENY ST/KERR AVE

Survey Date: Thursday, December 07, 2023

WO No: 41352

Start Time: 07:00

Device: Miovision

Full Study Summary (8 HR Standard)

Survey Date: Thursday, December 07, 2023

Total Observed U-Turns

AADT Factor

Northbound: 0 Southbound: 2
 Eastbound: 1 Westbound: 1

1.00

Period	Northbound				Southbound				Eastbound				Westbound				STR TOT	Grand Total	
	LT	ST	RT	NB TOT	LT	ST	RT	SB TOT	LT	ST	RT	EB TOT	LT	ST	RT	WB TOT			
07:00 08:00	10	16	2	28	5	17	9	31	59	22	17	7	46	5	42	8	55	101	160
08:00 09:00	25	9	6	40	5	9	13	27	67	39	69	18	126	12	109	13	134	260	327
09:00 10:00	13	8	10	31	6	8	10	24	55	25	32	14	71	8	52	13	73	144	199
11:30 12:30	18	11	9	38	12	10	20	42	80	13	35	11	59	7	50	8	65	124	204
12:30 13:30	20	21	6	47	14	21	11	46	93	16	26	8	50	14	59	9	82	132	225
15:00 16:00	23	18	15	56	12	8	15	35	91	43	58	13	114	4	63	15	82	196	287
16:00 17:00	27	13	5	45	10	7	19	36	81	38	60	7	105	6	92	9	107	212	293
17:00 18:00	16	10	2	28	5	6	5	16	44	22	34	14	70	4	55	4	63	133	177
Sub Total	152	106	55	313	69	86	102	257	570	218	331	92	641	60	522	79	661	1302	1872
U Turns				0				2	2				1				1	2	4
Total	152	106	55	313	69	86	102	259	572	218	331	92	642	60	522	79	662	1304	1876

EQ 12Hr 211 147 76 435 96 120 142 360 795 303 460 128 892 83 726 110 920 1813 2608
 Note: These values are calculated by multiplying the totals by the appropriate expansion factor. **1.39**

AVG 12Hr 211 147 76 435 96 157 186 360 795 303 460 128 892 83 726 110 920 1813 2608
 Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor. **1.00**

AVG 24Hr 276 193 100 570 126 206 244 472 1041 397 603 168 1169 109 951 144 1205 2375 3416
 Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor. **1.31**

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

BOYD AVE @ DOHENY ST/KERR AVE

Survey Date: Thursday, December 07, 2023

WO No: 41352

Start Time: 07:00

Device: Miovision

Full Study 15 Minute Increments

Time Period	Northbound				Southbound				Eastbound				Westbound				Grand Total			
	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT		W TOT	STR TOT	
07:00	07:15	4	3	0	7	0	3	4	7	14	2	4	1	7	2	11	5	18	25	39
07:15	07:30	3	5	0	8	3	7	1	11	19	3	2	3	8	0	12	2	14	22	41
07:30	07:45	3	5	1	9	1	3	0	4	13	5	7	2	14	2	9	0	11	25	38
07:45	08:00	0	3	1	4	1	4	4	9	13	12	4	1	17	1	10	1	12	29	42
08:00	08:15	2	3	3	8	2	2	4	8	16	1	8	6	15	6	24	2	32	47	63
08:15	08:30	6	1	1	8	1	2	1	4	12	4	14	3	21	0	30	4	34	55	67
08:30	08:45	8	1	0	9	0	3	4	7	16	21	23	4	48	3	31	2	36	84	100
08:45	09:00	9	4	2	15	2	2	4	8	23	13	24	5	42	3	24	5	32	74	97
09:00	09:15	2	0	1	3	1	2	3	7	10	7	9	3	19	2	13	5	21	40	50
09:15	09:30	7	0	2	9	2	2	5	9	18	14	10	3	27	2	15	2	19	46	64
09:30	09:45	2	4	3	9	1	2	1	4	13	3	7	4	15	0	15	2	17	32	45
09:45	10:00	2	4	4	10	2	2	1	5	15	1	6	4	11	4	9	4	17	28	43
11:30	11:45	4	3	1	8	3	4	3	10	18	4	6	3	13	3	6	2	11	24	42
11:45	12:00	6	1	2	9	3	1	3	7	16	2	8	3	13	0	17	2	19	32	48
12:00	12:15	7	5	4	16	3	2	10	15	31	1	10	3	14	2	14	4	20	34	65
12:15	12:30	1	2	2	5	3	3	4	10	15	6	11	2	19	2	13	0	15	34	49
12:30	12:45	8	7	2	17	3	12	3	18	35	2	7	4	13	5	15	1	21	34	69
12:45	13:00	2	5	0	7	2	1	5	8	15	5	8	1	14	3	9	3	15	29	44
13:00	13:15	6	6	1	13	3	4	0	7	20	5	7	3	15	1	21	0	22	37	57
13:15	13:30	4	3	3	10	6	4	3	13	23	4	4	0	8	5	14	5	24	32	55
15:00	15:15	3	3	4	10	0	2	2	4	14	15	12	4	31	0	11	6	17	48	62
15:15	15:30	7	6	2	15	2	2	5	9	24	7	13	2	22	1	15	0	16	38	62
15:30	15:45	8	4	3	15	2	1	3	6	21	9	13	2	24	1	11	2	14	38	59
15:45	16:00	5	5	6	16	8	3	5	16	32	12	20	5	37	2	26	7	35	72	104
16:00	16:15	8	3	1	12	3	1	5	10	22	10	18	0	28	1	21	0	22	50	72
16:15	16:30	0	4	1	5	2	1	5	8	13	8	13	4	25	1	23	4	28	53	66
16:30	16:45	12	4	1	17	3	4	8	15	32	12	11	0	23	2	25	3	30	53	85
16:45	17:00	7	2	2	11	2	1	1	4	15	8	18	3	29	2	23	2	27	56	71
17:00	17:15	6	4	1	11	3	2	3	8	19	11	12	4	27	1	16	3	20	47	66
17:15	17:30	5	3	0	8	1	2	0	3	11	5	14	4	23	3	20	0	23	46	57
17:30	17:45	3	1	1	5	1	1	1	3	8	4	6	5	15	0	10	1	11	26	34
17:45	18:00	2	2	0	4	0	1	1	2	6	2	2	1	5	0	9	0	9	14	20
Total:		152	106	55	313	69	86	102	259	572	218	331	92	642	60	522	79	662	1304	1,876

Note: U-Turns are included in Totals.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

BOYD AVE @ DOHENY ST/KERR AVE

Survey Date: Thursday, December 07, 2023

WO No: 41352

Start Time: 07:00

Device: Miovision

Full Study Cyclist Volume

Time Period	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00 07:15	0	0	0	1	0	1	1
07:15 07:30	0	0	0	0	0	0	0
07:30 07:45	0	0	0	0	0	0	0
07:45 08:00	0	0	0	0	0	0	0
08:00 08:15	0	0	0	1	0	1	1
08:15 08:30	0	0	0	0	0	0	0
08:30 08:45	0	0	0	0	0	0	0
08:45 09:00	0	0	0	0	0	0	0
09:00 09:15	0	0	0	1	0	1	1
09:15 09:30	0	0	0	0	0	0	0
09:30 09:45	0	0	0	0	0	0	0
09:45 10:00	0	0	0	0	0	0	0
11:30 11:45	0	0	0	0	0	0	0
11:45 12:00	0	0	0	0	0	0	0
12:00 12:15	0	0	0	0	0	0	0
12:15 12:30	0	0	0	0	0	0	0
12:30 12:45	0	0	0	0	0	0	0
12:45 13:00	0	0	0	0	0	0	0
13:00 13:15	0	0	0	0	0	0	0
13:15 13:30	0	0	0	0	0	0	0
15:00 15:15	0	0	0	0	0	0	0
15:15 15:30	0	0	0	0	0	0	0
15:30 15:45	1	0	1	0	0	0	1
15:45 16:00	0	0	0	0	0	0	0
16:00 16:15	0	0	0	0	0	0	0
16:15 16:30	0	0	0	0	0	0	0
16:30 16:45	0	0	0	0	0	0	0
16:45 17:00	0	0	0	0	0	0	0
17:00 17:15	0	0	0	0	0	0	0
17:15 17:30	0	0	0	0	0	0	0
17:30 17:45	0	0	0	0	0	0	0
17:45 18:00	0	0	0	0	0	0	0
Total	1	0	1	3	0	3	4



Transportation Services - Traffic Services

Turning Movement Count - Study Results

BOYD AVE @ DOHENY ST/KERR AVE

Survey Date: Thursday, December 07, 2023

WO No: 41352

Start Time: 07:00

Device: Miovision

Full Study Pedestrian Volume

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	0	1	1	0	0	0	1
07:15 07:30	1	0	1	0	2	2	3
07:30 07:45	3	1	4	0	0	0	4
07:45 08:00	0	0	0	0	0	0	0
08:00 08:15	1	0	1	0	1	1	2
08:15 08:30	3	3	6	4	0	4	10
08:30 08:45	1	0	1	0	0	0	1
08:45 09:00	4	1	5	0	0	0	5
09:00 09:15	1	0	1	1	0	1	2
09:15 09:30	1	0	1	1	0	1	2
09:30 09:45	0	0	0	0	0	0	0
09:45 10:00	0	2	2	1	0	1	3
11:30 11:45	3	0	3	1	1	2	5
11:45 12:00	0	0	0	1	0	1	1
12:00 12:15	0	0	0	1	0	1	1
12:15 12:30	1	0	1	1	0	1	2
12:30 12:45	0	1	1	0	0	0	1
12:45 13:00	1	1	2	0	1	1	3
13:00 13:15	0	0	0	0	0	0	0
13:15 13:30	0	0	0	0	1	1	1
15:00 15:15	1	2	3	0	1	1	4
15:15 15:30	0	0	0	0	0	0	0
15:30 15:45	2	0	2	0	0	0	2
15:45 16:00	0	0	0	0	0	0	0
16:00 16:15	3	0	3	0	0	0	3
16:15 16:30	0	0	0	0	0	0	0
16:30 16:45	1	0	1	1	1	2	3
16:45 17:00	0	2	2	2	0	2	4
17:00 17:15	2	0	2	0	1	1	3
17:15 17:30	1	0	1	0	1	1	2
17:30 17:45	3	1	4	1	3	4	8
17:45 18:00	1	0	1	0	1	1	2
Total	34	15	49	15	14	29	78



Transportation Services - Traffic Services

Turning Movement Count - Study Results

BOYD AVE @ DOHENY ST/KERR AVE

Survey Date: Thursday, December 07, 2023

WO No: 41352

Start Time: 07:00

Device: Miovision

Full Study Heavy Vehicles

Time Period	Northbound				Southbound				Eastbound				Westbound				Grand Total		
	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT		W TOT	STR TOT
07:00 07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 07:30	0	1	0	1	0	0	0	1	2	0	0	0	0	0	0	0	0	0	1
07:30 07:45	0	0	0	0	0	0	0	0	0	0	1	0	2	0	1	0	2	4	2
07:45 08:00	0	0	0	0	0	0	0	1	1	1	0	0	2	0	1	0	1	3	2
08:00 08:15	0	0	0	0	0	0	0	0	0	0	1	0	2	0	1	0	2	4	2
08:15 08:30	0	0	0	1	0	0	0	0	1	0	1	1	4	0	2	0	3	7	4
08:30 08:45	0	0	0	0	0	0	1	1	1	0	0	0	1	0	0	0	0	1	1
08:45 09:00	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	2	1
09:00 09:15	0	0	0	1	0	0	1	1	2	0	0	1	2	0	0	0	0	2	2
09:15 09:30	0	0	1	1	0	0	0	0	1	0	0	0	1	0	1	0	2	3	2
09:30 09:45	0	0	0	0	0	0	0	1	1	1	0	0	1	0	0	0	0	1	1
09:45 10:00	0	0	0	2	0	0	0	0	2	0	0	2	2	0	0	0	0	2	2
11:30 11:45	0	0	0	1	0	1	0	1	2	0	0	0	0	0	0	0	0	0	1
11:45 12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 12:15	1	2	0	3	0	0	0	2	5	0	0	0	1	0	0	0	0	1	3
12:15 12:30	0	0	0	0	0	0	0	1	1	1	0	0	1	0	0	0	0	1	1
12:30 12:45	0	0	1	2	0	0	0	0	2	0	0	1	2	0	1	0	2	4	3
12:45 13:00	0	1	0	1	2	0	0	4	5	0	0	0	0	0	0	1	3	3	4
13:00 13:15	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	2	1
13:15 13:30	1	1	0	3	0	0	0	1	4	0	0	0	1	1	0	0	1	2	3
15:00 15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15 15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30 15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45 16:00	0	0	0	1	0	1	0	1	2	0	0	0	0	0	0	0	0	0	1
16:00 16:15	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	2	1
16:15 16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30 16:45	0	0	0	1	0	0	0	1	2	1	0	0	2	1	1	0	2	4	3
16:45 17:00	0	1	0	1	0	0	0	1	2	0	0	0	0	0	0	0	0	0	1
17:00 17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15 17:30	1	0	0	2	0	0	0	0	2	0	0	1	2	0	0	0	0	2	2
17:30 17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45 18:00	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	2	1
Total: None	3	6	2	21	2	2	2	17	38	4	6	6	30	2	9	1	22	52	45



Transportation Services - Traffic Services

Turning Movement Count - Study Results

BOYD AVE @ DOHENY ST/KERR AVE

Survey Date: Thursday, December 07, 2023

WO No: 41352

Start Time: 07:00

Device: Miovision

Full Study 15 Minute U-Turn Total

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	0	0
07:15	07:30	0	0	0	0	0
07:30	07:45	0	0	0	0	0
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	0	0	0
08:15	08:30	0	0	0	0	0
08:30	08:45	0	0	0	0	0
08:45	09:00	0	0	0	0	0
09:00	09:15	0	1	0	1	2
09:15	09:30	0	0	0	0	0
09:30	09:45	0	0	1	0	1
09:45	10:00	0	0	0	0	0
11:30	11:45	0	0	0	0	0
11:45	12:00	0	0	0	0	0
12:00	12:15	0	0	0	0	0
12:15	12:30	0	0	0	0	0
12:30	12:45	0	0	0	0	0
12:45	13:00	0	0	0	0	0
13:00	13:15	0	0	0	0	0
13:15	13:30	0	0	0	0	0
15:00	15:15	0	0	0	0	0
15:15	15:30	0	0	0	0	0
15:30	15:45	0	0	0	0	0
15:45	16:00	0	0	0	0	0
16:00	16:15	0	1	0	0	1
16:15	16:30	0	0	0	0	0
16:30	16:45	0	0	0	0	0
16:45	17:00	0	0	0	0	0
17:00	17:15	0	0	0	0	0
17:15	17:30	0	0	0	0	0
17:30	17:45	0	0	0	0	0
17:45	18:00	0	0	0	0	0
Total		0	2	1	1	4

Turning Movement Count - Study Results

CARLING AVE @ BROADVIEW AVE

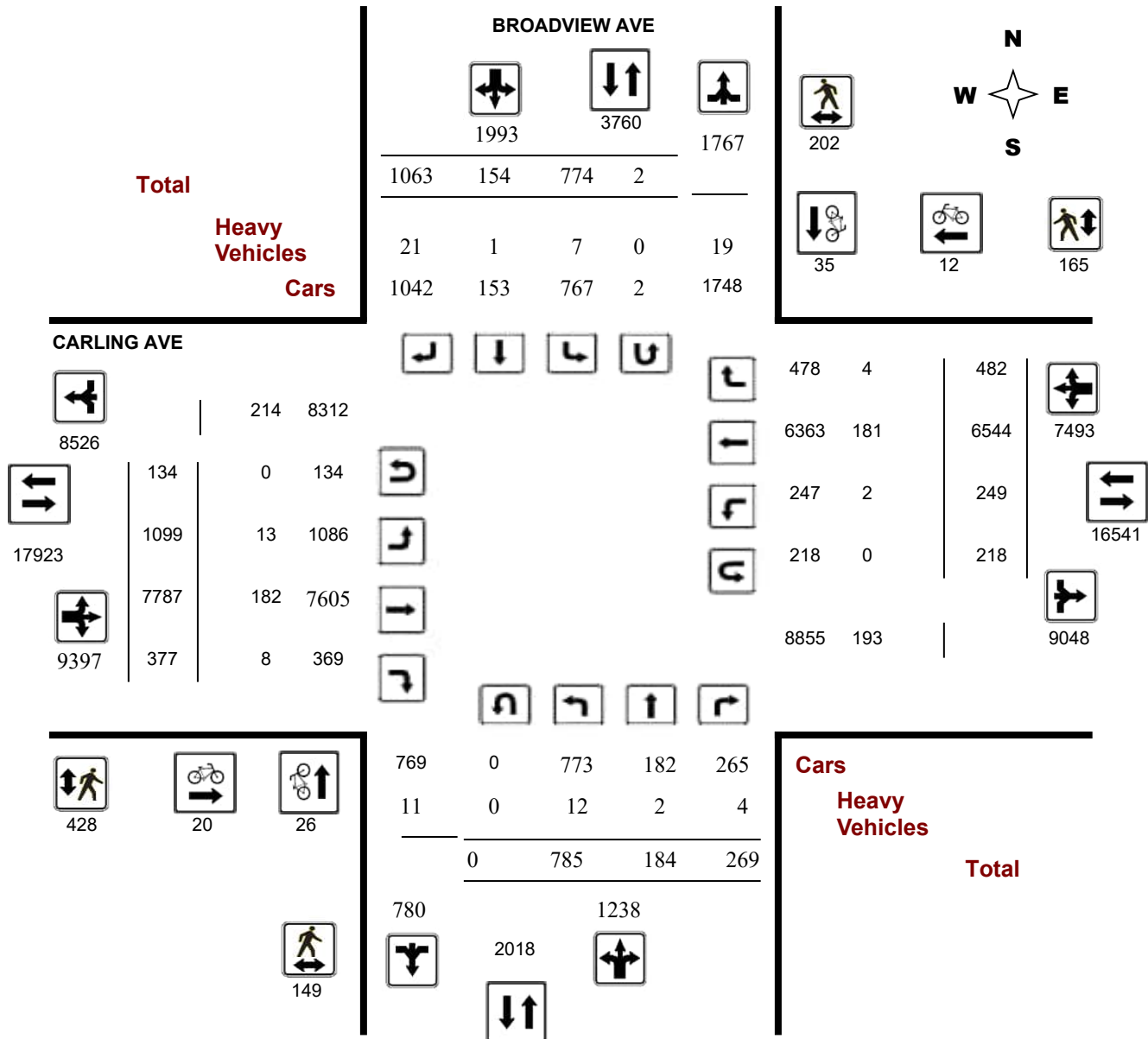
Survey Date: Thursday, May 02, 2024

WO No: 41845

Start Time: 07:00

Device: Miovision

Full Study Diagram



Turning Movement Count - Study Results

CARLING AVE @ BROADVIEW AVE

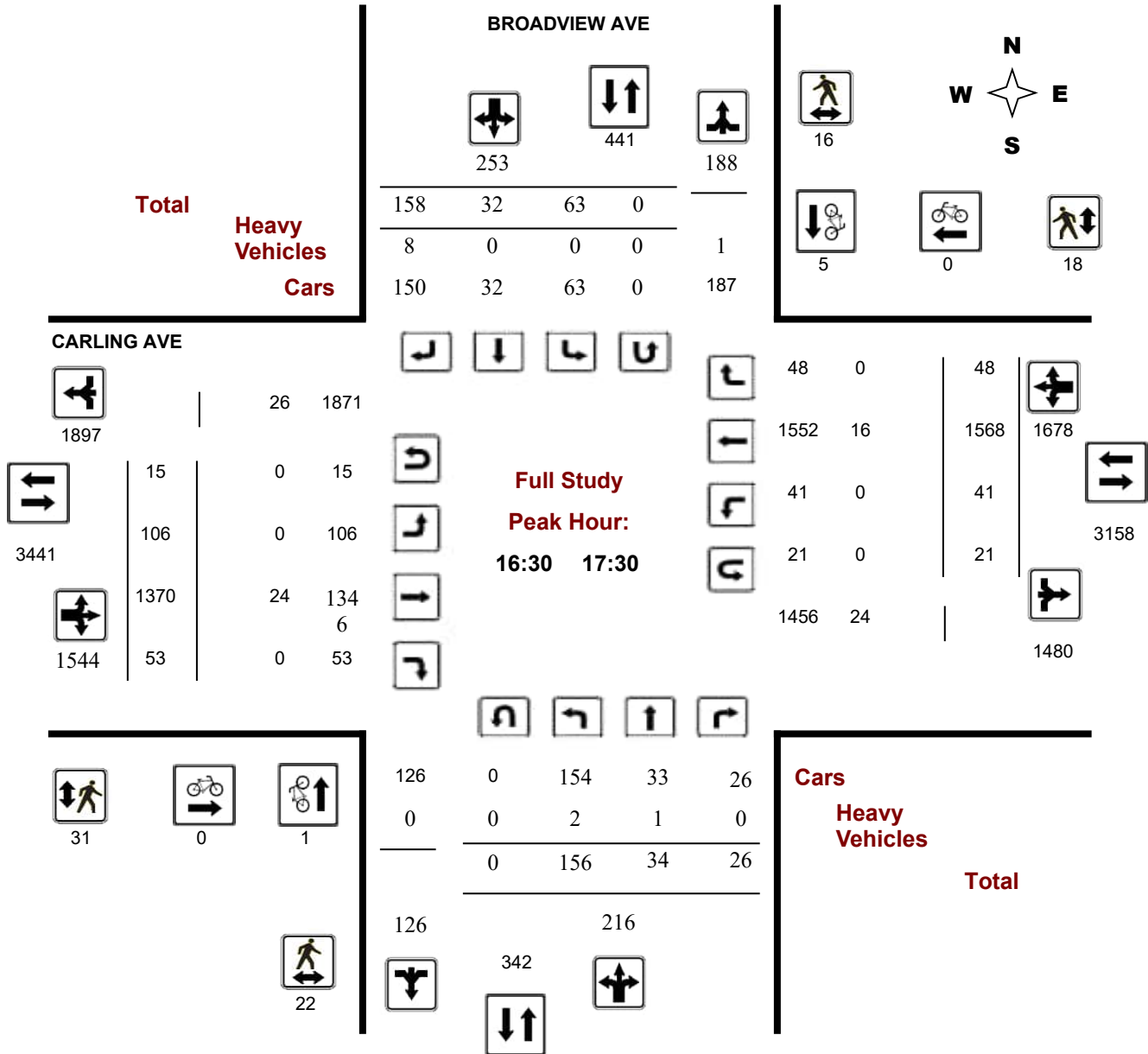
Survey Date: Thursday, May 02, 2024

WO No: 41845

Start Time: 07:00

Device: Miovision

Full Study Peak Hour Diagram



Turning Movement Count - Study Results

CARLING AVE @ BROADVIEW AVE

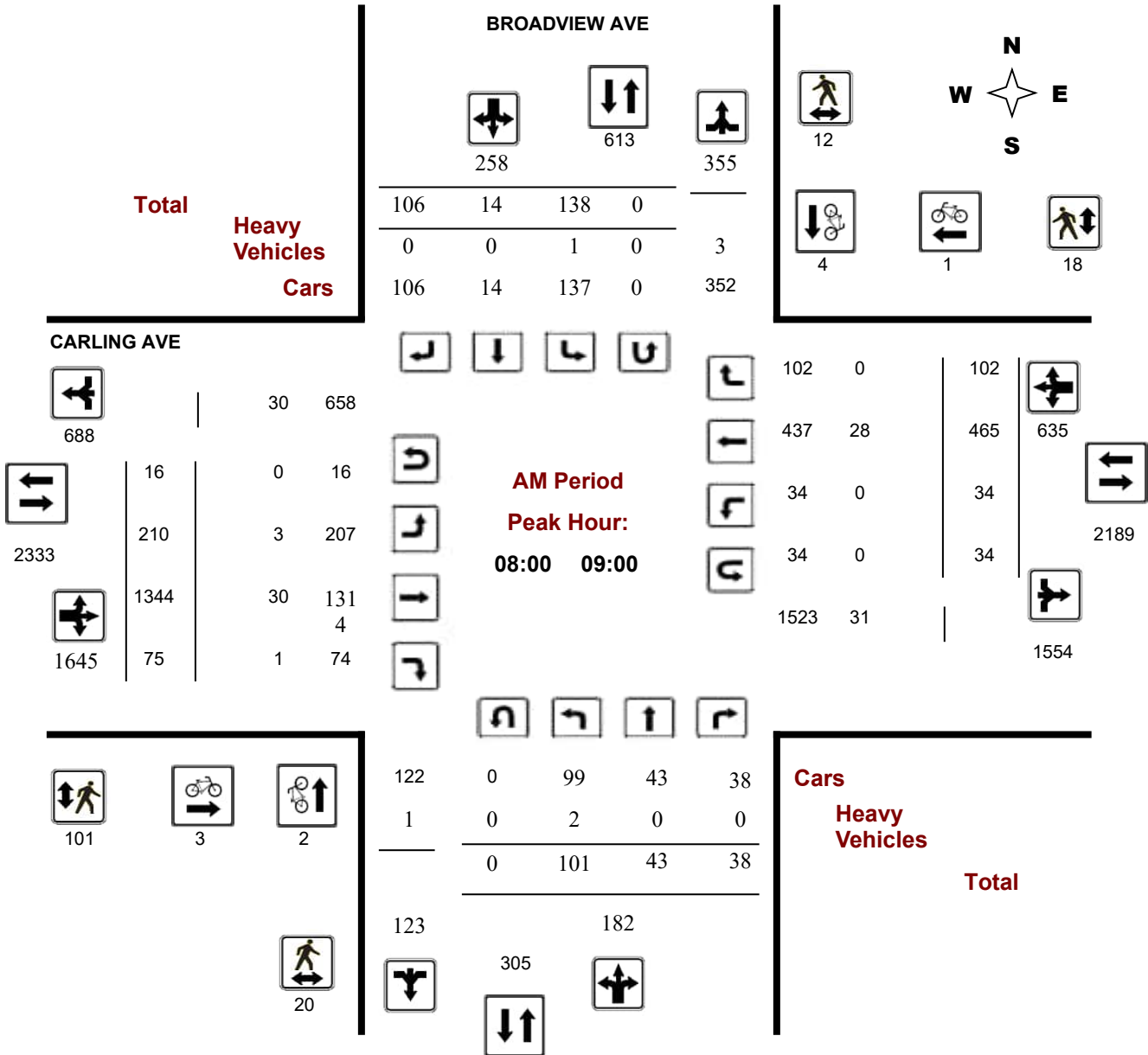
Survey Date: Thursday, May 02, 2024

WO No: 41845

Start Time: 07:00

Device: Miovision

AM Period Peak Hour Diagram



Turning Movement Count - Study Results

CARLING AVE @ BROADVIEW AVE

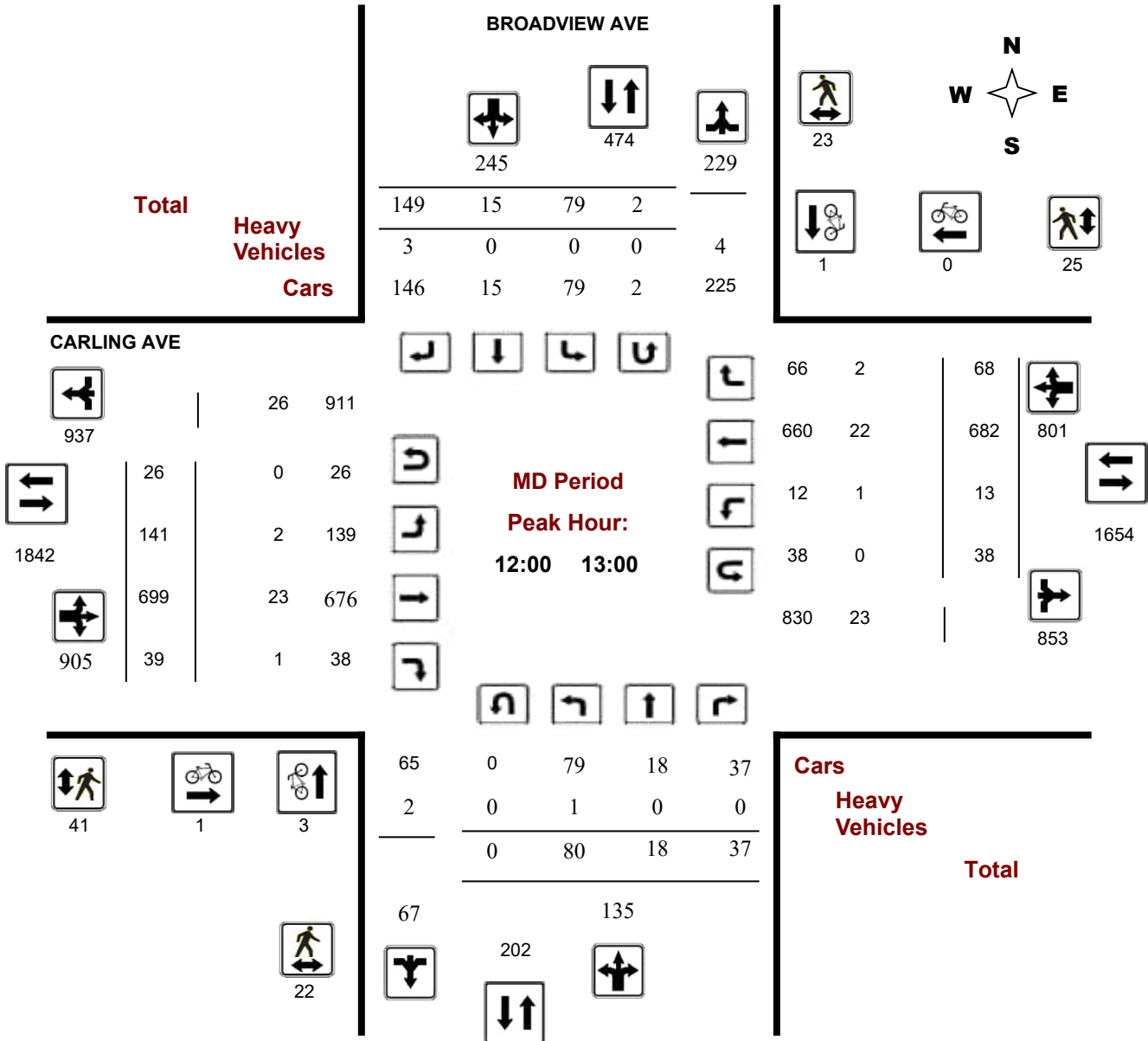
Survey Date: Thursday, May 02, 2024

WO No: 41845

Start Time: 07:00

Device: Miovision

MD Period Peak Hour Diagram



Turning Movement Count - Study Results

CARLING AVE @ BROADVIEW AVE

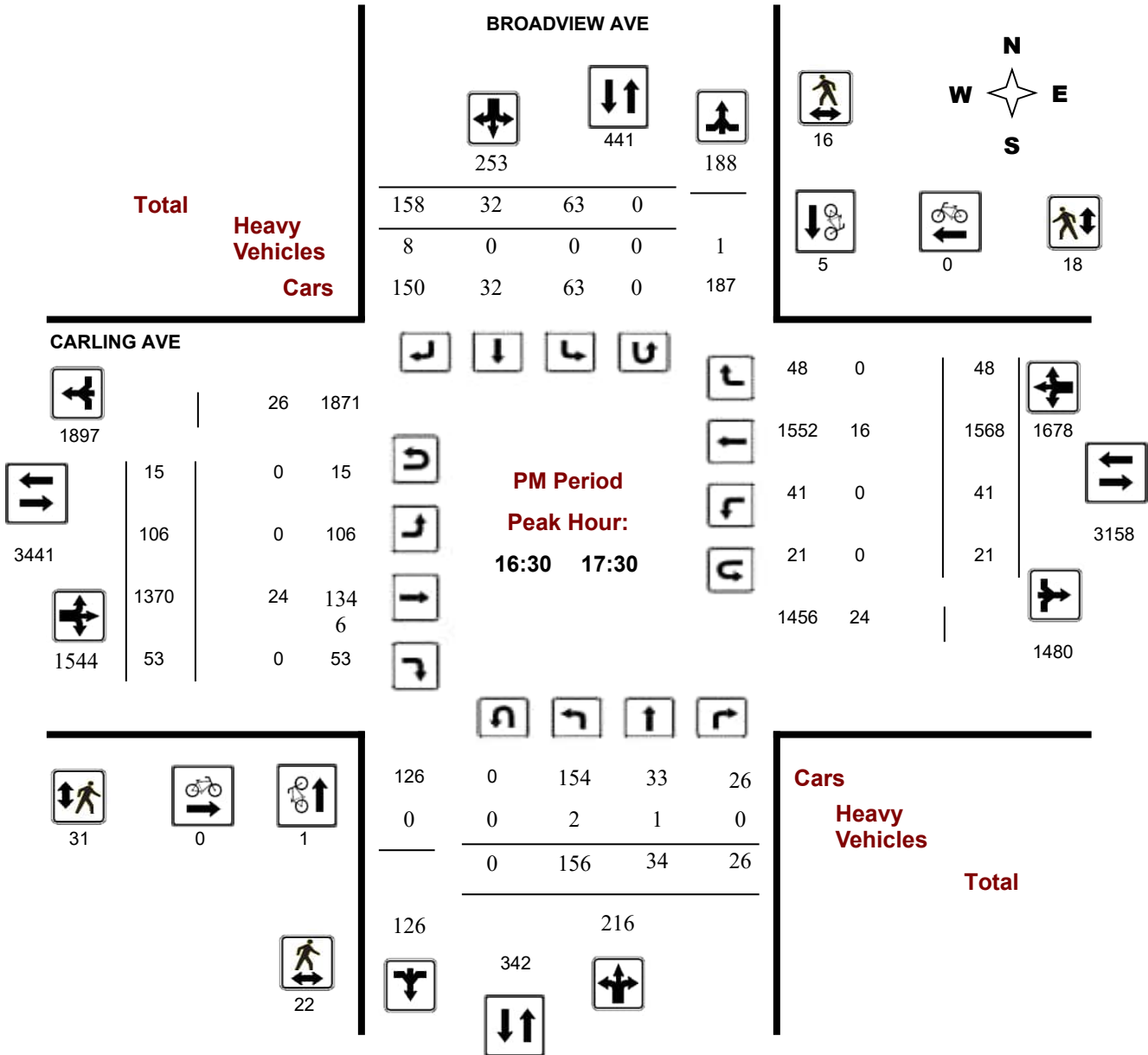
Survey Date: Thursday, May 02, 2024

WO No: 41845

Start Time: 07:00

Device: Miovision

PM Period Peak Hour Diagram





Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARLING AVE @ BROADVIEW AVE

Survey Date: Thursday, May 02, 2024

WO No: 41845

Start Time: 07:00

Device: Miovision

Full Study Summary (8 HR Standard)

Survey Date: Thursday, May 02, 2024

Total Observed U-Turns
 Northbound: 0 Southbound: 2
 Eastbound: 134 Westbound: 218

AADT Factor
 .90

BROADVIEW AVE

CARLING AVE

Period	Northbound					Southbound					Eastbound					Westbound					Grand Total
	LT	ST	RT	NB TOT	STR TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	STR TOT	LT	ST	RT	WB TOT	STR TOT	
07:00 08:00	47	10	32	89	232	73	19	51	143	322	103	972	38	1113	1557	14	379	51	444	1557	1789
08:00 09:00	101	43	38	182	440	138	14	106	258	440	210	1344	75	1629	2670	34	465	102	601	2230	2670
09:00 10:00	63	17	36	116	382	106	21	139	266	382	150	739	62	951	1944	34	522	55	611	1562	1944
11:30 12:30	78	17	30	125	389	93	17	154	264	389	128	674	31	833	1980	17	671	70	758	1591	1980
12:30 13:30	72	15	36	123	324	73	7	121	201	324	154	658	42	854	1871	17	619	57	693	1547	1871
15:00 16:00	148	20	38	206	551	144	26	175	345	551	129	810	44	983	2660	58	1014	54	1126	2109	2660
16:00 17:00	143	24	35	202	476	85	25	164	274	476	109	1268	48	1425	3473	32	1499	41	1572	2997	3473
17:00 18:00	133	38	24	195	435	62	25	153	240	435	116	1322	37	1475	3380	43	1375	52	1470	2945	3380
Sub Total	785	184	269	1238	3229	774	154	1063	1991	3229	1099	7787	377	9263	19767	249	6544	482	7275	16538	19767
U Turns				0	2				2	2				134	354				218	352	354
Total	785	184	269	1238	3231	774	154	1063	1993	3231	1099	7787	377	9397	20121	249	6544	482	7493	16890	20121

Note: These values are calculated by multiplying the totals by the appropriate expansion factor. **1.39**

AVG 12Hr 982 230 337 1549 968 252 1742 2493 4042 1375 9742 472 11756 311 8186 603 9374 21129 25171

Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor. **.90**

AVG 24Hr 1286 301 441 2029 1268 330 2282 3266 5295 1801 12762 618 15400 407 10724 790 12280 27679 32974

Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor. **1.31**

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARLING AVE @ BROADVIEW AVE

Survey Date: Thursday, May 02, 2024

WO No: 41845

Start Time: 07:00

Device: Miovision

Full Study 15 Minute Increments

BROADVIEW AVE

CARLING AVE

Northbound

Southbound

Eastbound

Westbound

Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00 07:15	11	3	1	15	16	3	10	29	44	13	170	7	190	6	79	6	103	293	337
07:15 07:30	14	2	9	25	13	8	10	31	56	23	239	8	270	1	87	12	106	376	432
07:30 07:45	11	2	10	23	22	2	18	42	65	26	266	7	301	0	96	14	118	419	484
07:45 08:00	11	3	12	26	22	6	13	41	67	41	297	16	355	7	117	19	152	507	574
08:00 08:15	19	8	3	30	30	1	20	51	81	59	322	16	400	6	113	22	153	553	634
08:15 08:30	17	10	10	37	31	8	22	61	98	43	384	14	444	7	116	32	161	605	703
08:30 08:45	26	17	15	58	43	5	31	79	137	56	349	28	439	11	105	28	156	595	732
08:45 09:00	39	8	10	57	34	0	33	67	124	52	289	17	362	10	131	20	165	527	651
09:00 09:15	19	6	9	34	39	8	33	80	114	53	192	13	261	13	130	20	174	435	549
09:15 09:30	14	7	11	32	27	10	39	76	108	31	229	18	282	5	127	15	152	434	542
09:30 09:45	15	2	8	25	20	1	33	54	79	31	170	14	220	7	137	13	166	386	465
09:45 10:00	15	2	8	25	20	2	34	56	81	35	148	17	207	9	128	7	153	360	441
11:30 11:45	20	7	9	36	20	4	33	57	93	35	149	7	195	7	176	16	207	402	495
11:45 12:00	18	0	3	21	26	4	37	67	88	31	170	9	214	3	141	17	166	380	468
17:45 18:00	16	7	7	30	14	4	36	54	84	30	262	6	303	14	250	15	283	586	670
17:00 17:15	45	15	5	65	11	7	50	68	133	26	343	14	383	11	392	12	419	802	935
12:00 12:15	22	7	11	40	26	5	49	81	121	29	162	7	202	6	181	19	220	422	543
12:15 12:30	18	3	7	28	21	4	35	61	89	33	193	8	247	1	173	18	201	448	537
12:30 12:45	19	2	11	32	16	2	33	51	83	33	166	10	212	4	159	12	186	398	481
12:45 13:00	21	6	8	35	16	4	32	52	87	46	178	14	244	2	169	19	194	438	525
13:00 13:15	17	5	9	31	21	1	28	50	81	40	145	7	198	8	144	15	171	369	450
13:15 13:30	15	2	8	25	20	0	28	48	73	35	169	11	223	3	147	11	163	386	459
15:00 15:15	27	5	5	37	46	4	46	96	133	42	171	9	225	11	219	10	244	469	602
15:15 15:30	26	8	12	46	45	6	49	100	146	29	212	14	260	18	245	17	284	544	690
15:30 15:45	54	3	11	68	40	7	39	86	154	21	200	8	232	14	268	15	302	534	688
15:45 16:00	41	4	10	55	13	9	41	63	118	37	227	13	280	15	282	12	315	595	713
16:00 16:15	46	8	12	66	34	1	44	79	145	21	304	9	335	7	320	8	339	674	819
16:15 16:30	20	5	8	33	16	7	46	69	102	33	308	10	357	6	397	9	417	774	876
16:30 16:45	34	6	8	48	17	11	42	70	118	27	310	16	362	9	393	14	421	783	901
16:45 17:00	43	5	7	55	18	6	32	56	111	28	346	13	392	10	389	10	417	809	920
17:15 17:30	34	8	6	48	17	8	34	59	107	25	371	10	407	11	394	12	421	828	935
17:30 17:45	38	8	6	52	20	6	33	59	111	35	346	7	395	7	339	13	364	759	870
Total:	785	184	269	1238	774	154	1063	1993	3231	1099	7787	377	9397	249	6544	482	7493	16890	20,121

Note: U-Turns are included in Totals.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARLING AVE @ BROADVIEW AVE

Survey Date: Thursday, May 02, 2024

WO No: 41845

Start Time: 07:00

Device: Miovision

Full Study Cyclist Volume

BROADVIEW AVE

CARLING AVE

Time Period	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00 07:15	0	0	0	2	0	2	2
07:15 07:30	0	0	0	0	0	0	0
07:30 07:45	2	0	2	0	0	0	2
07:45 08:00	1	0	1	1	0	1	2
08:00 08:15	2	0	2	1	1	2	4
08:15 08:30	0	4	4	1	0	1	5
08:30 08:45	0	0	0	0	0	0	0
08:45 09:00	0	0	0	1	0	1	1
09:00 09:15	2	0	2	0	0	0	2
09:15 09:30	0	0	0	0	0	0	0
09:30 09:45	0	1	1	0	1	1	2
09:45 10:00	0	0	0	0	0	0	0
11:30 11:45	0	0	0	1	0	1	1
11:45 12:00	5	2	7	3	2	5	12
17:45 18:00	0	6	6	1	0	1	7
17:00 17:15	0	2	2	0	0	0	2
12:00 12:15	0	0	0	1	0	1	1
12:15 12:30	0	0	0	0	0	0	0
12:30 12:45	3	0	3	0	0	0	3
12:45 13:00	0	1	1	0	0	0	1
13:00 13:15	0	0	0	1	0	1	1
13:15 13:30	2	0	2	0	1	1	3
15:00 15:15	0	2	2	0	1	1	3
15:15 15:30	1	3	4	0	2	2	6
15:30 15:45	0	1	1	0	0	0	1
15:45 16:00	1	0	1	1	2	3	4
16:00 16:15	0	4	4	1	0	1	5
16:15 16:30	5	3	8	1	0	1	9
16:30 16:45	1	1	2	0	0	0	2
16:45 17:00	0	0	0	0	0	0	0
17:15 17:30	0	2	2	0	0	0	2
17:30 17:45	1	3	4	4	2	6	10
Total	26	35	61	20	12	32	93



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARLING AVE @ BROADVIEW AVE

Survey Date: Thursday, May 02, 2024

WO No: 41845

Start Time: 07:00

Device: Miovision

Full Study Pedestrian Volume

BROADVIEW AVE

CARLING AVE

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	3	2	5	2	1	3	8
07:15 07:30	5	2	7	2	2	4	11
07:30 07:45	4	6	10	1	3	4	14
07:45 08:00	4	3	7	4	2	6	13
08:00 08:15	3	1	4	14	6	20	24
08:15 08:30	4	2	6	41	2	43	49
08:30 08:45	8	6	14	30	6	36	50
08:45 09:00	5	3	8	16	4	20	28
09:00 09:15	0	1	1	60	3	63	64
09:15 09:30	2	4	6	5	5	10	16
09:30 09:45	6	6	12	9	6	15	27
09:45 10:00	1	2	3	7	3	10	13
11:30 11:45	2	18	20	3	5	8	28
11:45 12:00	8	18	26	14	12	26	52
17:45 18:00	2	9	11	9	4	13	24
17:00 17:15	2	4	6	9	6	15	21
12:00 12:15	8	13	21	6	4	10	31
12:15 12:30	8	4	12	7	6	13	25
12:30 12:45	1	4	5	17	10	27	32
12:45 13:00	5	2	7	11	5	16	23
13:00 13:15	3	4	7	14	3	17	24
13:15 13:30	3	4	7	9	5	14	21
15:00 15:15	8	25	33	29	10	39	72
15:15 15:30	4	9	13	34	11	45	58
15:30 15:45	16	1	17	20	11	31	48
15:45 16:00	1	14	15	7	7	14	29
16:00 16:15	3	14	17	4	9	13	30
16:15 16:30	6	2	8	10	1	11	19
16:30 16:45	5	4	9	6	4	10	19
16:45 17:00	11	5	16	11	4	15	31
17:15 17:30	4	3	7	5	4	9	16
17:30 17:45	4	7	11	12	1	13	24
Total	149	202	351	428	165	593	944



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARLING AVE @ BROADVIEW AVE

Survey Date: Thursday, May 02, 2024

WO No: 41845

Start Time: 07:00

Device: Miovision

Full Study Heavy Vehicles

BROADVIEW AVE

CARLING AVE

Northbound

Southbound

Eastbound

Westbound

Time Period	Northbound			N TOT	Southbound			S TOT	STR TOT	Eastbound			E TOT	Westbound			W TOT	STR TOT	Grand Total
	LT	ST	RT		LT	ST	RT			LT	ST	RT		LT	ST	RT			
07:00 07:15	0	0	0	0	1	0	0	1	1	2	4	0	6	0	4	0	4	10	11
07:15 07:30	0	0	1	1	0	0	0	0	1	0	4	0	4	0	5	0	5	9	10
07:30 07:45	0	0	1	1	1	0	0	1	2	0	6	0	6	0	3	0	3	9	11
07:45 08:00	1	0	0	1	0	0	0	0	1	0	4	0	4	0	14	0	14	18	19
08:00 08:15	1	0	0	1	1	0	0	1	2	2	7	0	9	0	10	0	10	19	21
08:15 08:30	0	0	0	0	0	0	0	0	0	0	10	0	10	0	7	0	7	17	17
08:30 08:45	0	0	0	0	0	0	0	0	0	1	8	0	9	0	4	0	4	13	13
08:45 09:00	1	0	0	1	0	0	0	0	1	0	5	1	6	0	7	0	7	13	14
09:00 09:15	1	0	0	1	1	0	0	1	2	0	7	0	7	0	5	0	5	12	14
09:15 09:30	0	0	0	0	0	0	0	0	0	0	5	0	5	0	7	1	8	13	13
09:30 09:45	0	0	0	0	0	0	1	1	1	0	6	1	7	0	7	0	7	14	15
09:45 10:00	0	0	0	0	0	0	1	1	1	0	5	0	5	0	7	0	7	12	13
11:30 11:45	0	0	0	0	0	0	0	0	0	2	7	0	9	0	7	0	7	16	16
11:45 12:00	1	0	0	1	0	0	1	1	2	0	3	0	3	0	7	0	7	10	12
17:45 18:00	0	0	0	0	1	0	0	1	1	0	5	0	5	0	2	1	3	8	9
17:00 17:15	0	0	0	0	0	0	2	2	2	0	6	0	6	0	2	0	2	8	10
12:00 12:15	0	0	0	0	0	0	0	0	0	0	5	1	6	1	9	0	10	16	16
12:15 12:30	0	0	0	0	0	0	0	0	0	0	5	0	5	0	6	1	7	12	12
12:30 12:45	0	0	0	0	0	0	2	2	2	1	3	0	4	0	5	1	6	10	12
12:45 13:00	1	0	0	1	0	0	1	1	2	1	10	0	11	0	2	0	2	13	15
13:00 13:15	0	1	0	1	0	0	0	0	1	1	4	1	6	1	5	0	6	12	13
13:15 13:30	0	0	2	2	0	0	0	0	2	0	7	2	9	0	5	0	5	14	16
15:00 15:15	0	0	0	0	1	0	5	6	6	2	4	0	6	0	4	0	4	10	16
15:15 15:30	0	0	0	0	0	0	0	0	0	0	5	1	6	0	6	0	6	12	12
15:30 15:45	1	0	0	1	0	0	0	0	1	0	4	0	4	0	5	0	5	9	10
15:45 16:00	1	0	0	1	0	1	2	3	4	0	4	1	5	0	6	0	6	11	15
16:00 16:15	2	0	0	2	0	0	0	0	2	0	6	0	6	0	6	0	6	12	14
16:15 16:30	0	0	0	0	0	0	0	0	0	1	8	0	9	0	4	0	4	13	13
16:30 16:45	2	0	0	2	0	0	2	2	4	0	8	0	8	0	6	0	6	14	18
16:45 17:00	0	1	0	1	0	0	3	3	4	0	4	0	4	0	6	0	6	10	14
17:15 17:30	0	0	0	0	0	0	1	1	1	0	6	0	6	0	2	0	2	8	9
17:30 17:45	0	0	0	0	1	0	0	1	1	0	7	0	7	0	6	0	6	13	14
Total: None	12	2	4	18	7	1	21	29	47	13	182	8	203	2	181	4	187	390	437



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARLING AVE @ BROADVIEW AVE

Survey Date: Thursday, May 02, 2024

WO No: 41845

Start Time: 07:00

Device: Miovision

Full Study 15 Minute U-Turn Total

BROADVIEW AVE

CARLING AVE

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	0	12	12
07:15	07:30	0	0	0	6	6
07:30	07:45	0	0	2	8	10
07:45	08:00	0	0	1	9	10
08:00	08:15	0	0	3	12	15
08:15	08:30	0	0	3	6	9
08:30	08:45	0	0	6	12	18
08:45	09:00	0	0	4	4	8
09:00	09:15	0	0	3	11	14
09:15	09:30	0	0	4	5	9
09:30	09:45	0	0	5	9	14
09:45	10:00	0	0	7	9	16
11:30	11:45	0	0	4	8	12
11:45	12:00	0	0	4	5	9
17:45	18:00	0	0	5	4	9
17:00	17:15	0	0	0	4	4
12:00	12:15	0	1	4	14	19
12:15	12:30	0	1	13	9	23
12:30	12:45	0	0	3	11	14
12:45	13:00	0	0	6	4	10
13:00	13:15	0	0	6	4	10
13:15	13:30	0	0	8	2	10
15:00	15:15	0	0	3	4	7
15:15	15:30	0	0	5	4	9
15:30	15:45	0	0	3	5	8
15:45	16:00	0	0	3	6	9
16:00	16:15	0	0	1	4	5
16:15	16:30	0	0	6	5	11
16:30	16:45	0	0	9	5	14
16:45	17:00	0	0	5	8	13
17:15	17:30	0	0	1	4	5
17:30	17:45	0	0	7	5	12
Total		0	2	134	218	354

Turning Movement Count - Study Results

CARLING AVE @ CLYDE AVE/COLE AVE

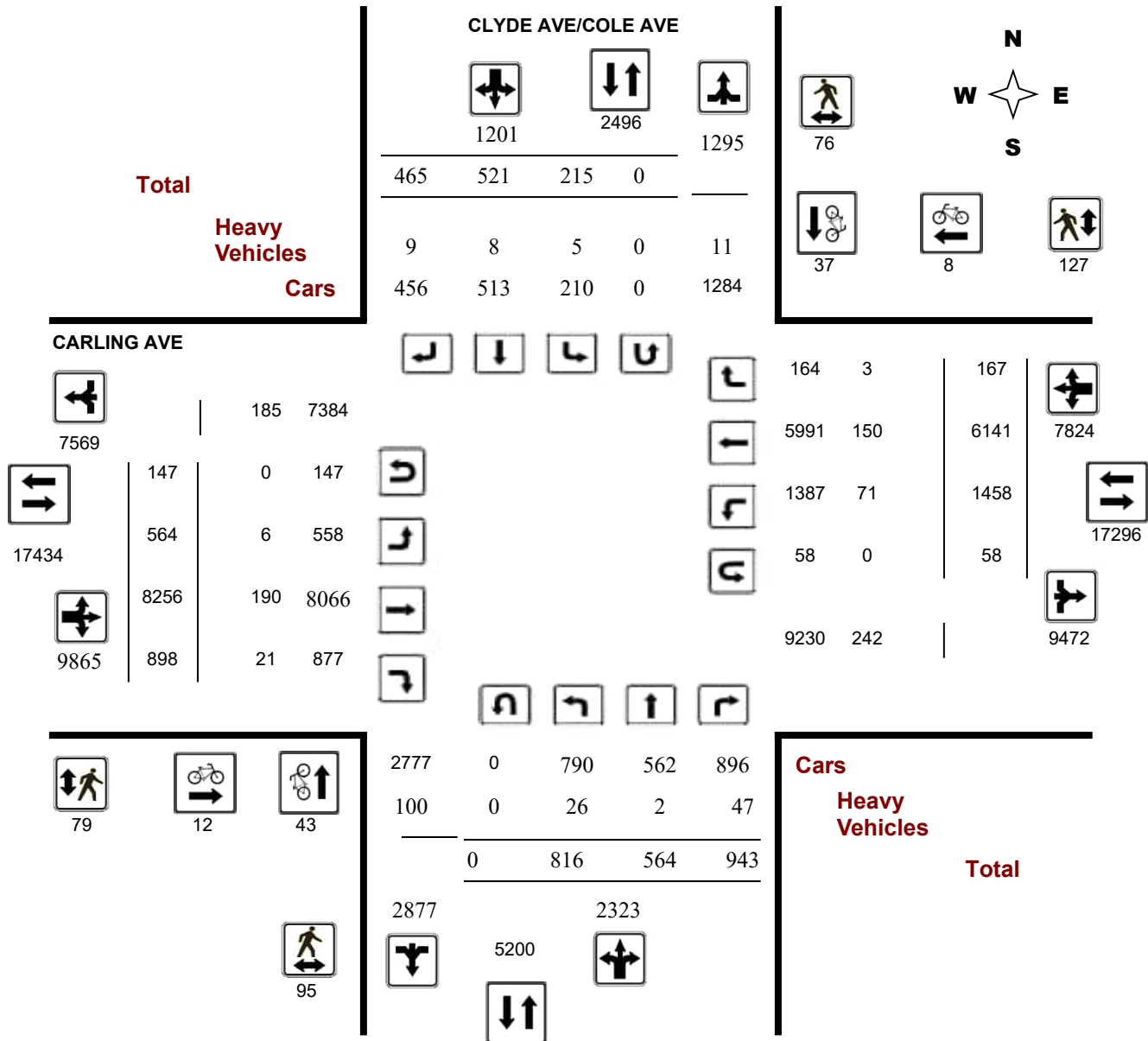
Survey Date: Tuesday, October 29, 2024

WO No: 42161

Start Time: 07:00

Device: Miovision

Full Study Diagram



Turning Movement Count - Study Results

CARLING AVE @ CLYDE AVE/COLE AVE

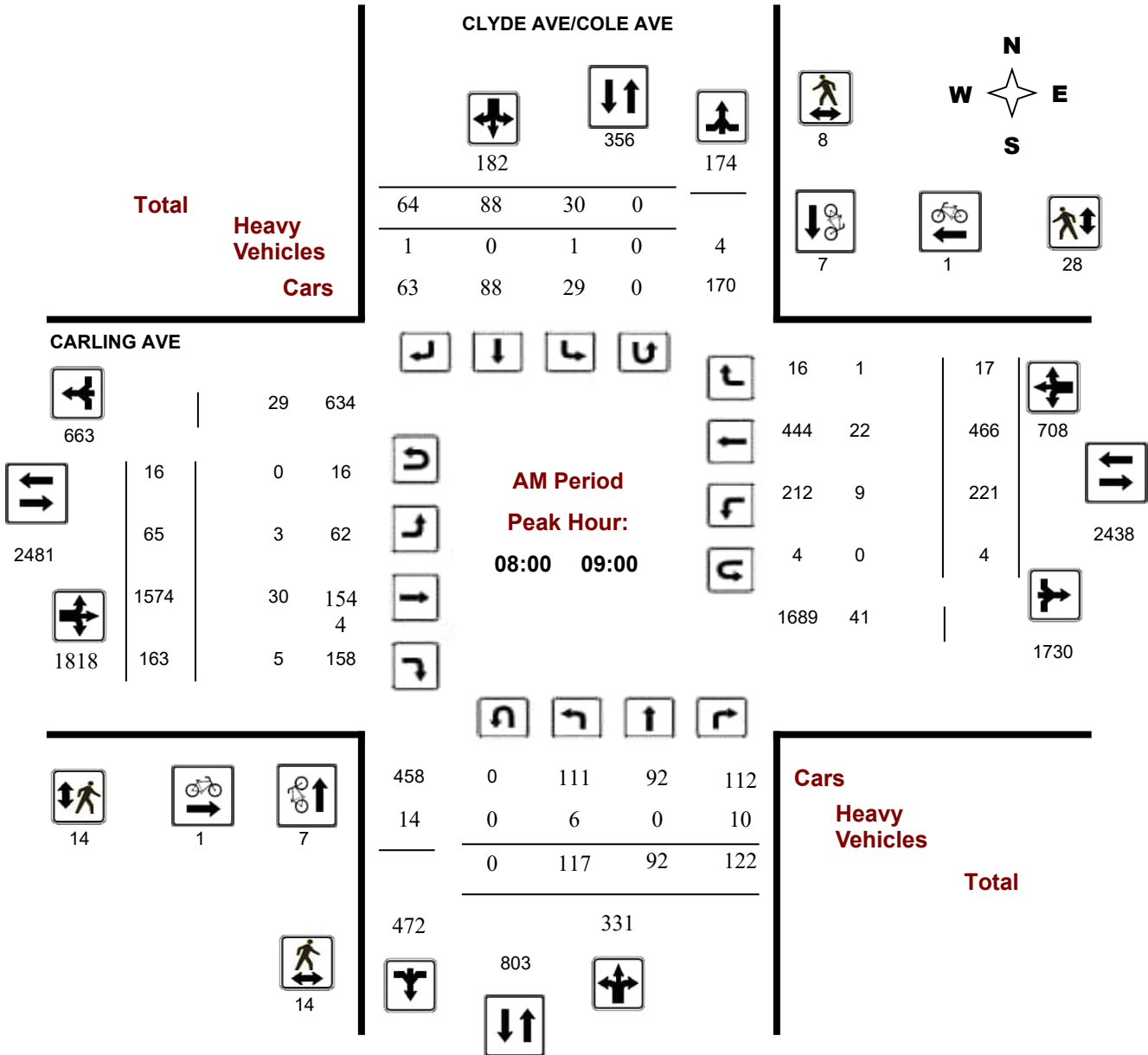
Survey Date: Tuesday, October 29, 2024

WO No: 42161

Start Time: 07:00

Device: Miovision

AM Period Peak Hour Diagram



Turning Movement Count - Study Results

CARLING AVE @ CLYDE AVE/COLE AVE

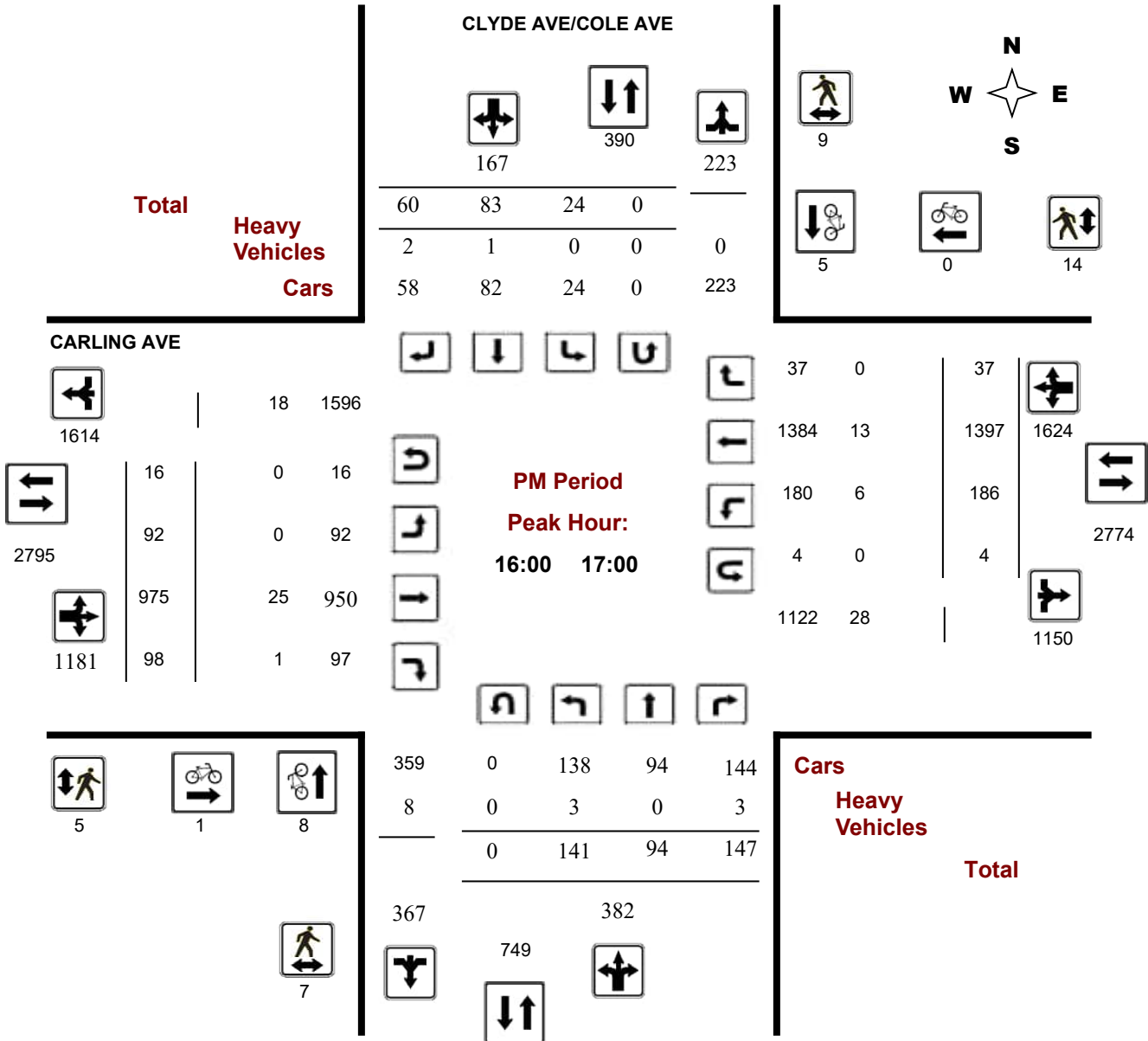
Survey Date: Tuesday, October 29, 2024

WO No: 42161

Start Time: 07:00

Device: Miovision

PM Period Peak Hour Diagram





Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARLING AVE @ CLYDE AVE/COLE AVE

Survey Date: Tuesday, October 29, 2024

WO No: 42161

Start Time: 07:00

Device: Miovision

Full Study Summary (8 HR Standard)

Survey Date: Tuesday, October 29, 2024

Total Observed U-Turns

AADT Factor

Northbound: 0 Southbound: 0
 Eastbound: 147 Westbound: 58
 .90

CLYDE AVE/COLE AVE

CARLING AVE

Period	Northbound					Southbound					Eastbound					Westbound					Grand Total
	LT	ST	RT	NB TOT	STR TOT	LT	ST	RT	SB TOT	STR TOT	LT	ST	RT	EB TOT	STR TOT	LT	ST	RT	WB TOT	STR TOT	
07:00 08:00	64	22	64	150	244	12	36	46	94	244	41	1704	117	1862	2325	155	301	7	463	2325	2569
08:00 09:00	117	92	122	331	513	30	88	64	182	513	65	1574	163	1802	2506	221	466	17	704	2506	3019
09:00 10:00	98	51	114	263	399	16	61	59	136	399	62	1002	129	1193	1876	176	495	12	683	1876	2275
11:30 12:30	95	72	120	287	449	34	61	67	162	449	71	601	109	781	1595	178	620	16	814	1595	2044
12:30 13:30	90	62	95	247	388	27	52	62	141	388	65	639	96	800	1548	158	572	18	748	1548	1936
15:00 16:00	114	81	160	355	516	32	69	60	161	516	64	916	95	1075	2435	166	1173	21	1360	2435	2951
16:00 17:00	141	94	147	382	549	24	83	60	167	549	92	975	98	1165	2785	186	1397	37	1620	2785	3334
17:00 18:00	97	90	121	308	466	40	71	47	158	466	104	845	91	1040	2414	218	1117	39	1374	2414	2880
Sub Total	816	564	943	2323	3524	215	521	465	1201	3524	564	8256	898	9718	17484	1458	6141	167	7766	17484	21008
U Turns				0	0				0	0				147	205				58	205	205
Total	816	564	943	2323	3524	215	521	465	1201	3524	564	8256	898	9865	17689	1458	6141	167	7824	17689	21213

EQ 12Hr 1134 784 1311 3229 299 724 646 1669 4898 784 11476 1248 13712 2027 8536 232 10875 24588 29486

Note: These values are calculated by multiplying the totals by the appropriate expansion factor. **1.39**

AVG 12Hr 1021 706 1180 2906 269 854 762 1502 4408 706 10328 1123 12341 1824 7682 209 9788 22129 26537

Note: These volumes are calculated by multiplying the Equivalent 12 hr. totals by the AADT factor. **.90**

AVG 24Hr 1338 925 1546 3807 352 1119 998 1968 5774 925 13530 1471 16167 2389 10063 274 12822 28989 34763

Note: These volumes are calculated by multiplying the Average Daily 12 hr. totals by 12 to 24 expansion factor. **1.31**

Note: U-Turns provided for approach totals. Refer to 'U-Turn' Report for specific breakdown.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARLING AVE @ CLYDE AVE/COLE AVE

Survey Date: Tuesday, October 29, 2024

WO No: 42161

Start Time: 07:00

Device: Miovision

Full Study 15 Minute Increments

CLYDE AVE/COLE AVE

CARLING AVE

Northbound

Southbound

Eastbound

Westbound

Time Period	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT	W TOT	STR TOT	Grand Total
07:00 07:15	9	3	17	29	1	5	10	16	45	9	379	25	414	33	65	1	100	514	559
07:15 07:30	15	4	18	37	3	6	13	22	59	9	403	32	450	35	58	2	96	546	605
07:30 07:45	18	6	7	31	3	8	9	20	51	8	481	29	526	39	97	3	139	665	716
07:45 08:00	22	9	22	53	5	17	14	36	89	15	441	31	487	48	81	1	130	617	706
08:00 08:15	22	17	24	63	9	18	20	47	110	6	424	49	484	61	128	2	191	675	785
08:15 08:30	41	18	29	88	5	27	20	52	140	18	435	40	494	41	124	4	171	665	805
08:30 08:45	25	23	37	85	6	19	12	37	122	23	374	31	434	55	102	7	165	599	721
08:45 09:00	29	34	32	95	10	24	12	46	141	18	341	43	406	64	112	4	181	587	728
09:00 09:15	27	17	39	83	4	22	21	47	130	20	289	39	352	41	131	5	178	530	660
09:15 09:30	26	16	29	71	4	20	13	37	108	14	271	39	333	66	123	3	197	530	638
09:30 09:45	24	9	26	59	5	5	15	25	84	14	243	25	285	35	111	3	152	437	521
09:45 10:00	21	9	20	50	3	14	10	27	77	14	199	26	245	34	130	1	167	412	489
11:30 11:45	13	10	27	50	10	16	8	34	84	13	146	29	200	58	142	9	211	411	495
11:45 12:00	22	27	32	81	9	16	16	41	122	17	156	28	207	43	142	2	189	396	518
12:00 12:15	29	11	29	69	7	13	21	41	110	23	169	17	216	45	161	1	210	426	536
12:15 12:30	31	24	32	87	8	16	22	46	133	18	130	35	190	32	175	4	214	404	537
12:30 12:45	25	20	32	77	4	10	20	34	111	20	158	15	199	33	136	7	178	377	488
12:45 13:00	23	14	19	56	7	13	13	33	89	17	162	31	218	55	152	6	218	436	525
13:00 13:15	15	18	22	55	7	15	10	32	87	14	182	33	235	38	141	3	183	418	505
13:15 13:30	27	10	22	59	9	14	19	42	101	14	137	17	172	32	143	2	182	354	455
15:00 15:15	28	12	46	86	6	13	17	36	122	16	197	20	239	33	215	7	256	495	617
15:15 15:30	29	21	38	88	14	22	20	56	144	18	220	25	268	46	300	8	359	627	771
15:30 15:45	26	24	42	92	5	19	12	36	128	13	236	30	280	47	340	1	391	671	799
15:45 16:00	31	24	34	89	7	15	11	33	122	17	263	20	302	40	318	5	365	667	789
16:00 16:15	36	14	33	83	3	20	15	38	121	20	249	20	294	43	394	10	448	742	863
16:15 16:30	47	26	42	115	7	20	9	36	151	16	215	27	262	36	335	7	378	640	791
16:30 16:45	20	19	41	80	8	20	23	51	131	29	271	28	333	51	328	7	388	721	852
16:45 17:00	38	35	31	104	6	23	13	42	146	27	240	23	292	56	340	13	410	702	848
17:00 17:15	22	25	42	89	9	19	16	44	133	26	249	29	306	55	297	8	360	666	799
17:15 17:30	24	24	36	84	14	13	12	39	123	17	197	24	243	57	272	11	343	586	709
17:30 17:45	26	17	25	68	10	22	10	42	110	31	215	21	268	57	279	9	345	613	723
17:45 18:00	25	24	18	67	7	17	9	33	100	30	184	17	231	49	269	11	329	560	660
Total:	816	564	943	2323	215	521	465	1201	3524	564	8256	898	9865	1458	6141	167	7824	17689	21,213

Note: U-Turns are included in Totals.



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARLING AVE @ CLYDE AVE/COLE AVE

Survey Date: Tuesday, October 29, 2024

WO No: 42161

Start Time: 07:00

Device: Miovision

Full Study Cyclist Volume

CLYDE AVE/COLE AVE

CARLING AVE

Time Period	Northbound	Southbound	Street Total	Eastbound	Westbound	Street Total	Grand Total
07:00 07:15	2	0	2	0	0	0	2
07:15 07:30	2	1	3	0	0	0	3
07:30 07:45	1	2	3	1	1	2	5
07:45 08:00	3	0	3	0	0	0	3
08:00 08:15	0	2	2	1	0	1	3
08:15 08:30	1	3	4	0	0	0	4
08:30 08:45	1	0	1	0	0	0	1
08:45 09:00	5	2	7	0	1	1	8
09:00 09:15	3	0	3	0	1	1	4
09:15 09:30	0	1	1	0	0	0	1
09:30 09:45	1	1	2	1	0	1	3
09:45 10:00	0	3	3	1	1	2	5
11:30 11:45	0	0	0	0	0	0	0
11:45 12:00	2	0	2	0	0	0	2
12:00 12:15	0	3	3	0	0	0	3
12:15 12:30	1	2	3	0	0	0	3
12:30 12:45	2	0	2	1	0	1	3
12:45 13:00	1	0	1	0	1	1	2
13:00 13:15	0	1	1	0	2	2	3
13:15 13:30	2	0	2	1	0	1	3
15:00 15:15	0	0	0	0	0	0	0
15:15 15:30	1	3	4	0	1	1	5
15:30 15:45	0	0	0	4	0	4	4
15:45 16:00	0	6	6	1	0	1	7
16:00 16:15	1	2	3	0	0	0	3
16:15 16:30	2	0	2	1	0	1	3
16:30 16:45	3	2	5	0	0	0	5
16:45 17:00	2	1	3	0	0	0	3
17:00 17:15	0	0	0	0	0	0	0
17:15 17:30	6	0	6	0	0	0	6
17:30 17:45	0	1	1	0	0	0	1
17:45 18:00	1	1	2	0	0	0	2
Total	43	37	80	12	8	20	100



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARLING AVE @ CLYDE AVE/COLE AVE

Survey Date: Tuesday, October 29, 2024

WO No: 42161

Start Time: 07:00

Device: Miovision

Full Study Pedestrian Volume

CLYDE AVE/COLE AVE

CARLING AVE

Time Period	NB Approach (E or W Crossing)	SB Approach (E or W Crossing)	Total	EB Approach (N or S Crossing)	WB Approach (N or S Crossing)	Total	Grand Total
07:00 07:15	1	2	3	4	1	5	8
07:15 07:30	2	3	5	4	3	7	12
07:30 07:45	3	0	3	3	3	6	9
07:45 08:00	4	4	8	4	3	7	15
08:00 08:15	4	0	4	2	2	4	8
08:15 08:30	3	4	7	2	8	10	17
08:30 08:45	3	2	5	2	9	11	16
08:45 09:00	4	2	6	8	9	17	23
09:00 09:15	3	2	5	3	4	7	12
09:15 09:30	2	0	2	2	3	5	7
09:30 09:45	5	3	8	1	2	3	11
09:45 10:00	4	2	6	5	0	5	11
11:30 11:45	1	2	3	1	2	3	6
11:45 12:00	4	2	6	1	5	6	12
12:00 12:15	4	4	8	0	2	2	10
12:15 12:30	7	2	9	3	6	9	18
12:30 12:45	5	4	9	0	6	6	15
12:45 13:00	5	4	9	5	5	10	19
13:00 13:15	1	1	2	2	3	5	7
13:15 13:30	3	2	5	3	1	4	9
15:00 15:15	1	5	6	3	4	7	13
15:15 15:30	3	4	7	5	3	8	15
15:30 15:45	1	10	11	5	5	10	21
15:45 16:00	2	1	3	1	5	6	9
16:00 16:15	3	3	6	3	10	13	19
16:15 16:30	0	4	4	2	1	3	7
16:30 16:45	1	2	3	0	2	2	5
16:45 17:00	3	0	3	0	1	1	4
17:00 17:15	4	1	5	2	8	10	15
17:15 17:30	5	1	6	3	7	10	16
17:30 17:45	2	0	2	0	1	1	3
17:45 18:00	2	0	2	0	3	3	5
Total	95	76	171	79	127	206	377



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARLING AVE @ CLYDE AVE/COLE AVE

Survey Date: Tuesday, October 29, 2024

WO No: 42161

Start Time: 07:00

Device: Miovision

Full Study Heavy Vehicles

CLYDE AVE/COLE AVE

CARLING AVE

Northbound Southbound Eastbound Westbound

Time Period	Northbound				Southbound				Eastbound				Westbound				Grand Total			
	LT	ST	RT	N TOT	LT	ST	RT	S TOT	STR TOT	LT	ST	RT	E TOT	LT	ST	RT		W TOT	STR TOT	
07:00-07:15	0	0	1	1	0	0	0	0	1	0	5	1	6	3	2	0	5	11	12	
07:15-07:30	2	0	1	3	0	0	2	2	5	0	6	0	6	2	3	0	5	11	16	
07:30-07:45	0	0	1	1	0	0	0	0	1	0	6	0	6	1	8	0	9	15	16	
07:45-08:00	1	1	0	2	1	2	0	3	5	0	5	0	5	2	3	0	5	10	15	
08:00-08:15	0	0	1	1	1	0	0	1	2	1	7	2	10	3	7	0	10	20	22	
08:15-08:30	4	0	3	7	0	0	0	0	7	1	4	2	7	4	4	0	8	15	22	
08:30-08:45	1	0	4	5	0	0	0	0	5	1	12	1	14	2	2	1	5	19	24	
08:45-09:00	1	0	2	3	0	0	1	1	4	0	7	0	7	0	9	0	9	16	20	
09:00-09:15	0	1	0	1	0	0	0	0	1	0	9	1	10	6	4	0	10	20	21	
09:15-09:30	1	0	2	3	0	0	0	0	3	0	7	1	8	4	5	0	9	17	20	
09:30-09:45	2	0	2	4	0	2	0	2	6	1	7	0	8	2	5	0	7	15	21	
09:45-10:00	0	0	4	4	0	1	1	2	6	0	11	2	13	6	5	0	11	24	30	
11:30-11:45	2	0	3	5	1	0	1	2	7	0	8	3	11	9	8	0	17	28	35	
11:45-12:00	1	0	3	4	0	0	0	0	4	1	6	0	7	1	6	0	7	14	18	
12:00-12:15	2	0	0	2	0	0	0	0	2	0	7	1	8	5	5	0	10	18	20	
12:15-12:30	0	0	3	3	0	0	1	1	4	0	5	1	6	0	4	0	4	10	14	
12:30-12:45	0	0	1	1	0	0	0	0	1	0	4	0	4	3	5	0	8	12	13	
12:45-13:00	0	0	3	3	0	1	0	1	4	0	4	2	6	4	6	1	11	17	21	
13:00-13:15	3	0	1	4	0	0	0	0	4	0	8	2	10	2	6	0	8	18	22	
13:15-13:30	1	0	2	3	1	0	0	1	4	1	2	0	3	0	7	0	7	10	14	
15:00-15:15	1	0	1	2	1	1	1	3	5	0	8	1	9	2	6	1	9	18	23	
15:15-15:30	1	0	2	3	0	0	0	0	3	0	5	0	5	0	10	0	10	15	18	
15:30-15:45	0	0	2	2	0	0	0	0	2	0	3	0	3	2	5	0	7	10	12	
15:45-16:00	0	0	1	1	0	0	0	0	1	0	6	0	6	0	1	0	1	7	8	
16:00-16:15	1	0	1	2	0	0	1	1	3	0	6	0	6	1	3	0	4	10	13	
16:15-16:30	2	0	1	3	0	0	1	1	4	0	5	0	5	2	5	0	7	12	16	
16:30-16:45	0	0	0	0	0	0	0	0	0	0	7	1	8	1	3	0	4	12	12	
16:45-17:00	0	0	1	1	0	1	0	1	2	0	7	0	7	2	2	0	4	11	13	
17:00-17:15	0	0	0	0	0	0	0	0	0	0	1	0	1	0	3	0	3	4	4	
17:15-17:30	0	0	1	1	0	0	0	0	1	0	3	0	3	1	4	0	5	8	9	
17:30-17:45	0	0	0	0	0	0	0	0	0	0	5	0	5	0	2	0	2	7	7	
17:45-18:00	0	0	0	0	0	0	0	0	0	0	4	0	4	1	2	0	3	7	7	
Total:	None	26	2	47	75	5	8	9	22	97	6	190	21	217	71	150	3	224	441	538



Transportation Services - Traffic Services

Turning Movement Count - Study Results

CARLING AVE @ CLYDE AVE/COLE AVE

Survey Date: Tuesday, October 29, 2024

WO No: 42161

Start Time: 07:00

Device: Miovision

Full Study 15 Minute U-Turn Total

CLYDE AVE/COLE AVE

CARLING AVE

Time Period		Northbound U-Turn Total	Southbound U-Turn Total	Eastbound U-Turn Total	Westbound U-Turn Total	Total
07:00	07:15	0	0	1	1	2
07:15	07:30	0	0	6	1	7
07:30	07:45	0	0	8	0	8
07:45	08:00	0	0	0	0	0
08:00	08:15	0	0	5	0	5
08:15	08:30	0	0	1	2	3
08:30	08:45	0	0	6	1	7
08:45	09:00	0	0	4	1	5
09:00	09:15	0	0	4	1	5
09:15	09:30	0	0	9	5	14
09:30	09:45	0	0	3	3	6
09:45	10:00	0	0	6	2	8
11:30	11:45	0	0	12	2	14
11:45	12:00	0	0	6	2	8
12:00	12:15	0	0	7	3	10
12:15	12:30	0	0	7	3	10
12:30	12:45	0	0	6	2	8
12:45	13:00	0	0	8	5	13
13:00	13:15	0	0	6	1	7
13:15	13:30	0	0	4	5	9
15:00	15:15	0	0	6	1	7
15:15	15:30	0	0	5	5	10
15:30	15:45	0	0	1	3	4
15:45	16:00	0	0	2	2	4
16:00	16:15	0	0	5	1	6
16:15	16:30	0	0	4	0	4
16:30	16:45	0	0	5	2	7
16:45	17:00	0	0	2	1	3
17:00	17:15	0	0	2	0	2
17:15	17:30	0	0	5	3	8
17:30	17:45	0	0	1	0	1
17:45	18:00	0	0	0	0	0
Total		0	0	147	58	205

ENVIRONMENTAL NOISE CONTROL GUIDELINES: Introduction and Glossary

January 2016

Appendix B: Table of Traffic and Road Parameters To Be Used For Sound Level Predictions

Table B1 Traffic And Road Parameters To Be Used For Sound Level Predictions

Row Width (m)	Implied Roadway Class	AADT Vehicles/Day	Posted Speed Km/Hr	Day/Night Split %	Medium Trucks %	Heavy Trucks % ¹
NA ²	Freeway, Queensway, Highway	18,333 per lane	100	92/8	7	5
37.5-44.5	6-Lane Urban Arterial-Divided (6 UAD)	50,000	50-80	92/8	7	5
34-37.5	4-Lane Urban Arterial-Divided (4-UAD)	35,000	50-80	92/8	7	5
23-34	4-Lane Urban Arterial-Undivided (4-UAU)	30,000	50-80	92/8	7	5
23-34	4-Lane Major Collector (4-UMCU)	24,000	40-60	92/8	7	5
30-35.5	2-Lane Rural Arterial (2-RAU)	15,000	50-80	92/8	7	5
20-30	2-Lane Urban Arterial (2-UAU)	15,000	50-80	92/8	7	5
20-30	2-Lane Major Collector (2-UMCU)	12,000	40-60	92/8	7	5
30-35.5	2-Lane Outer Rural Arterial (near the extremities of the City) (2-RAU)	10,000	50-80	92/8	7	5
20-30	2-Lane Urban Collector (2-UCU)	8,000	40-50	92/8	7	5

¹ The MOE Vehicle Classification definitions should be used to estimate automobiles, medium trucks and heavy trucks.

² The number of lanes is determined by the future mature state of the roadway.

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APPENDIX D

NOISE MITIGATION GUIDANCE

Acoustic/Noise Barrier

Generally, noise controls to attenuate transportation sound levels at Outdoor Living Areas (OLAs) would consist of the implementation of acoustic/noise barriers with materials that would meet the guidance included in NPC-300, for example:

- A wall, berm, wall/berm combination or similar structure, used as a noise control measure, and high enough to break the line-of-sight between the source and the receptor.
- The minimum surface density (face weight) is 20 kg/m²
 - Many materials could satisfy the surface density requirement, e.g. wood, glass, concrete, Plexiglas, Acrylite.
 - The required thickness can be determined by dividing the 20 kg/m² face weight by the material density (kg/m³). Typically, this would imply:
 - 50 mm (2") thickness of wood
 - 13 mm (0.5") thickness of lighter plastic (like Plexiglas or PVC)
 - 6 mm (0.25") thickness of heavier material (like aluminum, glass, concrete)
- The barrier should be structurally sound, appropriately designed to withstand wind and snow load, and constructed without cracks or surface gaps. Joints between panels may need to be overlapped to ensure surfaces are free of gaps, particularly for wood construction.
- Any gaps under the barrier that are necessary for drainage purposes should be minimized and localized, so that the acoustical performance of the barrier is maintained.
- If a sound absorptive face is to be included in the barrier design, the minimum noise reduction coefficient is recommended to be NRC 0.7.

Building Ventilation and Air Conditioning

The use of air conditioning itself is not a noise control measure; however, it allows for windows and doors to remain closed, thereby reducing the indoor sound levels.

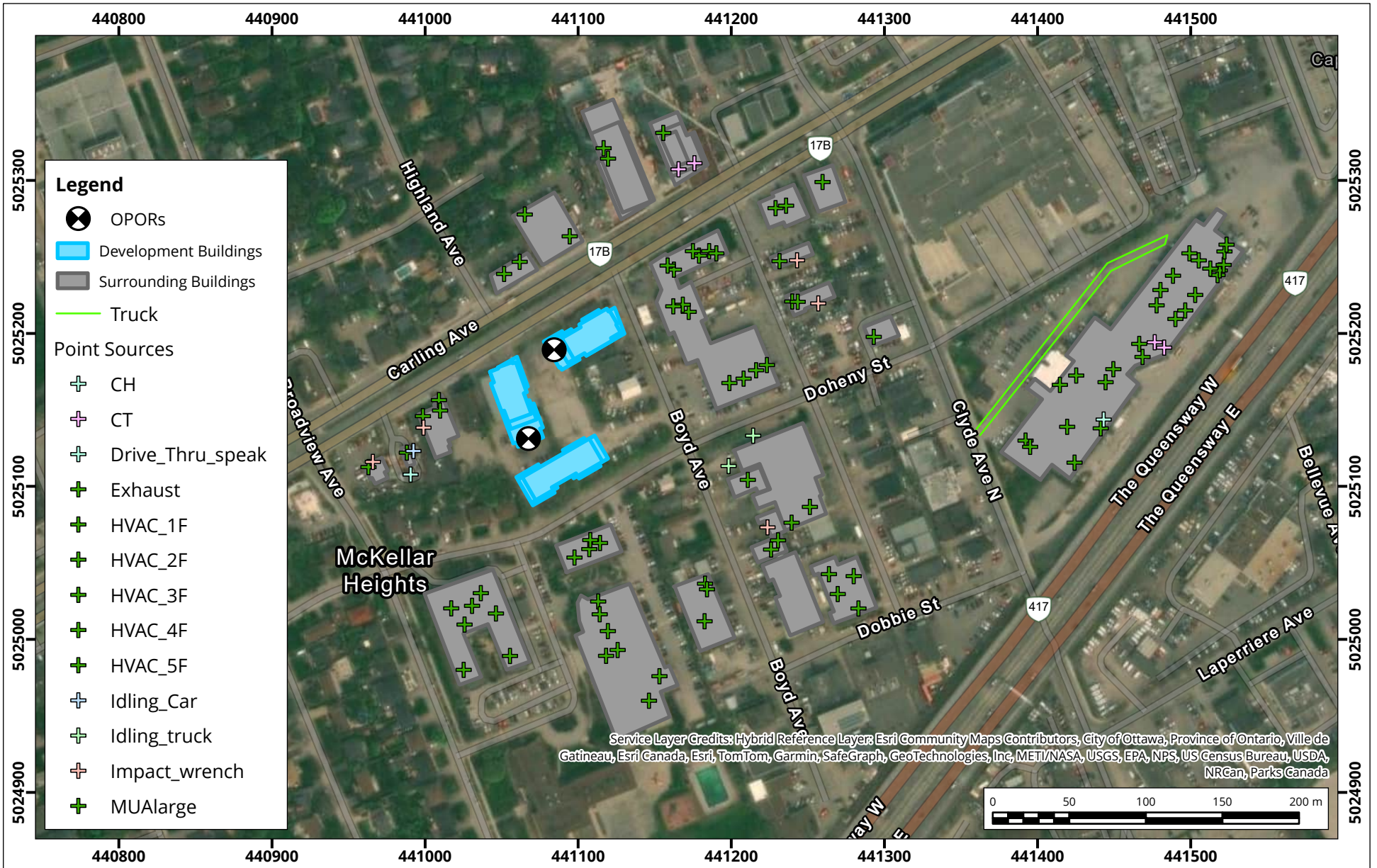
NPC-300 provides the following guidance with respect to implementation of building ventilation and air conditioning:

- a. the noise produced by the proposed ventilation system in the space served does not exceed 40 dBA. In practice, this condition usually implies that window air conditioning units are not acceptable;
- b. the ventilation system complies with all national, provincial and municipal standards and codes;
- c. the ventilation system is designed by a heating and ventilation professional; and
- d. the ventilation system enables the windows and exterior doors to remain closed.

Air conditioning systems also need to comply with Publication NPC-216, and/or any local municipal noise by-law that has provisions relating to air conditioning equipment.

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APPENDIX E



Stationary Sources

Location of Stationary Sources in Relation to the Proposed Development

Map Projection: NAD 1983 UTM Zone 18N
1746 Carling Ave, Ottawa, ON



Drawn by: SY Figure: E.1

Approx. Scale: 1:3,500

Date Revised: Feb 18, 2025



Project #:2403794

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APPENDIX F

WARNING CLAUSES

All NPC-300 warning clauses are presented as general guidance for context. However, not all warning clauses may apply to this proposed development. See the report body text for which warning clauses are recommended.

Warning clauses are recommended to be included on all development agreements, offers of purchase and agreements of purchase and sale or lease. Warning clauses may be used individually or in combination. The following warning clauses are recommended based on the applicable guidelines; however, wording may be modified/customized during consultation with the planning authority to best suit the proposed development.

Transportation Sources

NPC-300 Type A: Recommended to address surface transportation sound levels in OLAs if sound level is in the range of >55 dBA but ≤ 60 dBA, and noise controls have not been provided.

"Purchasers/tenants are advised that sound levels due to increasing road traffic (rail traffic) (air traffic) may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment."

NPC-300 Type B: Recommended to address surface transportation sound levels in OLAs if the sound level is in the range of >55 dBA but ≤ 60 dBA, and noise controls have been provided. Recommended to address outdoor aircraft sound levels ≥NEF 30.

"Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic (rail traffic) (air traffic) may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Municipality and the Ministry of the Environment."

NPC-300 Type C: Applicable for low and medium density developments only, recommended to address transportation sound levels at the plane of window.

"This dwelling unit has been designed with the provision for adding central air conditioning at the occupant's discretion. Installation of central air conditioning by the occupant in low and medium density developments will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment."

NPC-300 Type D: Recommended to address transportation sound levels at the plane of window.

"This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of the Environment."



Proximity to Railway Line: Metrolinx/CN/CP/VIA Warning Clause for developments that are within 300 metres of the right-of-way

"Warning: [Canadian National Railway Company] [Metrolinx / GO] [Canadian Pacific Railway Company] [VIA Rail Canada Inc.] or its assigns or successors in interest has or have a right-of-way within 300 metres from the land the subject hereof. There may be alterations to or expansions of the rail facilities on such right-of-way in the future including the possibility that the railway or its assigns or successors as aforesaid may expand its operations, which expansion may affect the living environment of the residents in the vicinity, notwithstanding the inclusion of any noise and vibration attenuating measures in the design of the development and individual dwelling(s). CNR/Metrolinx/GO/CPR/VIA will not responsible for any complaints or claims arising from use of such facilities and/or operations on, over or under the aforesaid right-of-way."

Stationary Sources

NPC-300 Type E: Recommended to address proximity to commercial/industrial land-use

"Purchasers/tenants are advised that due to the proximity of the adjacent industrial/commercial land-uses, noise from the industrial/commercial land-uses may at times be audible."

NPC-300 Type F: Recommended to for Class 4 Area Notification

"Purchasers/tenants are advised that sound levels due to the adjacent industry (facility) (utility) are required to comply with sound level limits that are protective of indoor areas and are based on the assumption that windows and exterior doors are closed. This dwelling unit has been supplied with a ventilation/air conditioning system which will allow windows and exterior doors to remain closed."