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Noise and Vibration Feasibility Study
13 Mountain Street and 19 Elm Street
Grimsby, Ontario

Prepared for:

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May 14, 2021

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VERSION CONTROL

Ver.	Date	Version Description / Changelog	Prepared By
0	2021-05-14	Noise and Vibration Feasibility Study to support official plan amendment and rezoning.	A. Rogers D. McCumber

Limitations

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1 INTRODUCTION AND SUMMARY

Howe Gastmeier Chapnik Limited (HGC Engineering) was retained by Valentine Coleman 1 Inc. and Valentine Coleman 2 Inc. to provide a Noise and Vibration Feasibility Study for the proposed mixed-use development at 13 Mountain Street and 19 Elm Street, in the Town of Grimsby ("the site"). This assessment is based on the conceptual drawings "ZBA Issue", dated May 7, 2021, prepared by SvN Architects + Planners.

The site is located on the northeast corner of the intersection of Mountain Street and Elm Street. Figure 1 shows a key plan of the site. The development plan provides for the construction of a mixed-use 7-storey building connecting to two existing buildings, Woolverton House and Woolverton Hall. The site plan is shown in Figure 2.

Road traffic on Mountain Street is the primary source of noise with potential impact on the proposed development. Road traffic on Elm Street and Main Street are secondary noise sources, as well as road traffic on the QEW and rail traffic on the CN rail line north of the site.

Traffic volumes for the surrounding roadways were obtained from the Niagara Region Transportation Services Division and the Ministry of Transportation (MTO). Traffic volumes for the rail line were obtained from CN. The transportation traffic data was used to predict future sound levels (L_{EQ}) at the proposed building façades and outdoor amenity areas. The predicted sound levels were compared to the guidelines of the Ministry of the Environment, Conservation and Parks (MECP) to develop associated traffic noise control recommendations for the proposed development.

The surrounding area includes low-rise commercial, retail, residential buildings. These neighbouring uses may generate some audible noise at times, but no specific sources of potential concern have been identified, and there were no related audible noises noted during the site visit. No quantitative assessment of noise from any surrounding properties has been conducted in the context of this feasibility study.

There were no sources of vibration identified in the environment around this development site, and therefore potential vibration impacts are not of concern and are not mentioned further in this report.

The future mixed-use development will include non-residential uses, and consideration will need to be given during detailed design of the future non-residential spaces to ensure that those uses do not adversely impact the adjacent residential uses.

Warning clauses for noise are required to be included in the development agreements and/or lease provisions, and recommended wording for those clauses is provided herein.

2 SITE DESCRIPTION

The subject property is located in Grimsby, on the northeast corner of the intersection of Elm Street and Mountain Street. According to the architectural drawings dated May 7, 2021 ("ZBA Issue"), the development will be comprised of a 7-storey residential building, above 2.5 levels of underground parking. The ground floor is shown to include residential suites, mechanical and electrical spaces, utility areas, and amenity space (indoor and outdoor). The remaining floors are shown to include residential suites, with the exception of the mechanical penthouse on the roof. Two existing buildings, Woolverton House and Woolverton Hall (both two storeys) will be connected to the development; Woolverton Hall will continue to be used as a community hall and Woolverton House will be used as commercial space.

The site is bound by Mountain Street to the west and Elm Street to the south. Main Street is located approximately 90 metres to the northeast. The Queen Elizabeth Way highway (QEW) is located approximately 615 metres to the north. There is a rail corridor, carrying both CN and VIA trains, located approximately 410 metres to the north. At this distance, noise and vibration from the rail line does not strictly need to be considered; however, the rail line has been included as part of the noise model, for completeness.

A site visit was conducted in March of 2021, to make observations of the acoustical environment. The primary source of transportation sound emissions in the area was confirmed to be road traffic on Mountain Street, with contributions from road traffic on Elm Street. During the site visit, no other noise sources of particular concern were noted in the environment immediately surrounding the site.

The site is near the downtown area of Grimsby, surrounded by low-rise commercial, retail, and residential buildings. To the south are low-rise residential buildings. To the west is a mix of low-rise residential and commercial buildings. To the north and east are low-rise commercial buildings with downtown Grimsby beyond. In terms of the classifications provided for in Ministry of the Environment (MECP) guidelines, this area is considered to be a Class 1 "urban" acoustical environment.

3 TRAFFIC NOISE CRITERIA

Guidelines for acceptable levels of road and rail traffic noise impacting residential developments are contained in the MECP publication NPC-300, "Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning" [1], August, 2013 (release date October 21, 2013), and are listed in Table 1 below. The values in Table 1 are energy equivalent (average) sound levels [L_{EQ}] in units of A-weighted deciBels [dBA].

Table 1: MECP Road/Rail Traffic Noise Criteria (dBA)

Area	Day (dBA) (7:00 – 23:00)	Night (dBA) (23:00 – 7:00)
Outdoor Living Area	55 dBA*	--
Inside Living/Dining Rooms	45/40	45/40
Inside Bedrooms	45/40	40/35

*Up to 60 dBA with a warning clause

These criteria apply to the surrounding vehicular traffic. Daytime refers to the period between 07:00 and 23:00, while night-time refers to the period between 23:00 and 07:00. Corridors and washrooms are usually not considered to be noise-sensitive areas.

The term "Outdoor Living Area" (OLA) is used in reference to an outdoor patio, a backyard, a terrace, a garden, or common areas associated with high-rise multi-unit buildings where passive outdoor recreation is expected to occur. Balconies and elevated terraces (e.g., rooftops) with a depth of less than 4 meters are not considered OLAs under MECP guidelines, and accordingly the noise criteria are not applicable there. Larger private terraces require consideration only if they are the only OLA for the occupant; in general, common outdoor amenity terraces associated with high-rise buildings are the only OLAs that require consideration.

In cases where a minor excess (up to 5 dB) over the sound level limit in an OLA is anticipated, MECP guidelines allow the excess to be addressed by including a warning clause in the titles, deeds or tenancy agreements for the affected dwellings. Where OLA sound levels exceed 60 dBA, physical noise control measures, such as an acoustical barrier, are required.

Where the traffic noise level (L_{EQ}) is greater than 60 dBA at night or 65 dBA during the day, windows must be designed to achieve the indoor sound level criteria listed above. Otherwise, any glazing meeting the Ontario Building Code is considered adequate under MECP guidelines. Where

the predicted nighttime and/or daytime sound levels exceed these thresholds, central air conditioning is required so that windows can remain closed against the noise.

The indoor sound level limits for rail sources are 5 dB more stringent than for road sources, to account for the additional low-frequency (rumble) components of locomotives, hence the façade insulation requirements are calculated separately and then combined.

Warning clauses to notify future residents of possible excesses are required when nighttime road traffic sound levels exceed 50 dBA at the plane of the windows or when daytime sound levels exceed 55 dBA in the outdoor living areas or at the plane of the windows.

4 TRAFFIC NOISE ASSESSMENT

4.1 Road Traffic Data

Traffic data summaries for the key roads surrounding the site were obtained from the Niagara Region Transportation Services Division (see Appendix A). These data were provided in the form of 8-hour intersection turning counts; in order to obtain 24-hour traffic volumes required to predict future sound levels during both the 16-hour daytime and 8-hour night-time periods, the following assumptions were made:

- The 24-hour traffic volumes were assumed to be double the obtained 8-hour daily peak volumes;
- The prediction considered traffic that will exist in 20 years (2041), assuming traffic annual growth of 2.5% on all roadways, as required by the Niagara Region for regional roads;
- Half of all trucks were assumed to be heavy, the other half medium, and buses were counted as medium trucks;
- Daytime (7:00 – 23:00) vs night-time (23:00 – 7:00) traffic volumes were determined based on an assumed 90% day / 10% night split.

Traffic data for the QEW was obtained from the MTO in the form of Annual Average Daily Traffic (AADT) for the year 2016 and is also included in Appendix A. The following assumptions were made:

- The prediction considered traffic that will exist in 10 years (2031), assuming traffic annual growth of 2.5%, per MECP guidelines;
- A commercial vehicle percentage of 9% was provided; half were assumed to be heavy trucks, and the other half were assumed to be medium;

- Daytime (7:00 – 23:00) vs night-time (23:00 – 7:00) traffic volumes were determined based on an assumed 85% day / 15% night split.

The resulting future road traffic volumes for the roads used in this assessment are listed in Table 2, in addition to commercial vehicle (truck) percentages and the posted speed limit for each roadway.

Table 2: 2041 Projected Road Traffic Data

Road Name	AADT	Day / Night Split (% / %)	Commercial Vehicle Percentages		Posted Speed Limit (km/h)
			Medium Truck %	Heavy Truck %	
Mountain Street (south of Main)	14,138	90 / 10	3.9	3.9	50
Elm Street (south of Main)	14,331	90 / 10	0.7	0.7	50
Main Street (east of Mountain)	22,678	90 / 10	1.2	1.2	50
QEW*	116,057	85 / 15	4.5	4.5	100

*Traffic data projected to 2031.

4.2 Rail Traffic Data

Rail traffic data was obtained from CN and VIA Rail, and is contained in Appendix A. This data was escalated to the year 2031 at an annual rate of 2.5%, as per MECP guidelines. The rail volumes used in the analysis are summarized in Table 3.

Table 3: 2031 Projected Rail Traffic Data

Type of Train	No. of engines (max)	No. of cars (max)	No. of Trains Daytime (07:00-23:00)	No. of Trains Night-time (23:00-07:00)	Max Speed (mph)
Freight (CN)	4	140	5.1	0	60
Passenger (VIA)	2	10	2.6	0	65

4.3 Prediction Results

The sound propagation portion of the modelling has been completed using methods from ISO Standard 9613-2, "Acoustics - Attenuation of Sound During Propagation Outdoors" [2], which accounts for reduction in sound level with distance due to geometrical spreading, air absorption, ground attenuation and acoustical shielding by intervening structures. *CadnaA, version 2020 MR1,* software package was used for this purpose, as it is well equipped to process calculations in complex, three-dimensional environments. ISO 9613-2 is a widely recognized standard for predicting sound propagation in the environment, and is accepted by many Ontario municipalities, and the MECP.

The surrounding buildings were incorporated into the model. The road and rail noise sources have been included in the model as line sources, calibrated to be equal at a reference distance of 15 m to levels predicted in STAMSON 5.04, a computer algorithm developed by the MECP, based on the average daily traffic volumes presented in Table 2.

The model was used to predict traffic noise levels at each of the building façades. Predicted daytime and night-time sound levels at the building façades are shown in Figure 3 and Figure 4, respectively. Maximum sound level contributions at each façade for representative receptor locations in the building are shown in the table below. As expected, noise from the rail line is minimal in comparison with noise from the surrounding roadways.

Table 4: Road / Rail / Total Traffic Sound Level Prediction at Building Façades [dBA]

Time of Day	North	East	South	West
Day (16-hour average)	64/51/64	60/49/60	64/36/64	65/49/65
Night (8-hour average)	58/--/58	55/--/55	58/--/58	59/--/59

An outdoor amenity area is shown on the ground floor, on the east side of the building. The receptor location for the outdoor amenity space is represented by prediction location R1, as shown in Figure 5. The predicted sound level ($L_{Aeq,16hr}$) at this location is 51 dBA.

4.4 Recommendations

The maximum predicted sound levels at the building façade were found to be up to 65 dBA during daytime hours, and up to 59 dBA during nighttime hours.

The following sections outline preliminary recommendations for building façade constructions and ventilation requirements to achieve the noise criteria discussed in Section 3.

4.4.1 Outdoor Living Areas

Since there is a common outdoor amenity space on the ground floor provided for the use of all residents, private terraces and balconies in the development do not require assessment. The common outdoor amenity area is subject to the MECP criteria outlined in Table 1. The outdoor amenity space is represented by prediction location R1 on Figure 5.

The predicted future average daytime sound level is less than 55 dBA at the receptor location. No additional noise abatement is required for this amenity space to comply with the MECP criteria outlined in Section 3.

4.4.2 Ventilation Requirements

At the residential façades, the predicted sound levels are less than the thresholds stated in Section 3, and thus central air conditioning systems are not strictly required; however, such systems are expected to be included in any case.

4.4.3 Minimum Building Façade Constructions

Given the projected future sound levels at the building façades, any glazing meeting the Ontario Building Code is considered adequate under MECP guidelines; however, in an urban environment such as this, we do not typically recommend glazing acoustical performance below STC-33. This can generally be achieved with typical glazing constructions used in high-rise buildings (i.e., two 5-6 mm thick panes separated by a 13 mm air space). Operable doors and windows can be up to three points lower; the performance of operable elements is typically determined by the seals.

It is assumed that exterior wall assemblies have sufficient sound insulation such that sound transmitted through them is negligible in comparison to the glazing. Precast or masonry exterior walls will meet these requirements, as will spandrel or metal panels that are backed by an independent drywall assembly.

5 IMPACT OF THE DEVELOPMENT ON THE ENVIRONMENT

Sound levels from stationary (non-traffic) sources of noise such as rooftop air-conditioners, cooling towers, exhaust fans, etc. should not exceed the minimum one-hour L_{EQ} ambient (background) sound level from road traffic, at any potentially impacted residential point of reception, to comply with provincial noise guidelines (i.e., NPC-300) and to avoid complaints. The typical minimum ambient sound levels in the area are expected to be in the range of 45 dBA during the night and 50 dBA during the day (depending on exposure to the roadways), at nearby residential receptors. Thus, any electro-mechanical equipment associated with this development should be designed such that they do not result in noise impact beyond these ranges. The proposed building will be higher than the current neighbouring buildings, thus noise from the mechanical penthouse on the roof of this building is not expected to substantially impact the neighbouring buildings, provided that reasonable typical control measures are included.

6 IMPACT OF THE DEVELOPMENT ON ITSELF

Section 5.9.1 of the Ontario Building Code (OBC) specifies the minimum required sound insulation characteristics for demising partitions, in terms of STC or ASTC values. In order to maintain adequate acoustical privacy between separate suites in a multi-tenant building, inter-suite walls should meet or exceed STC-50 or ASTC-47. Walls separating a suite from a noisy space such as a refuse chute, or elevator shaft, should meet or exceed STC-55. In addition, it is recommended that the floor/ceiling constructions separating suites from any amenity or commercial spaces also meet or exceed STC-55. Tables 1 and 2 in Section SB-3 of the Supplementary Guideline to the OBC provide a comprehensive list of constructions that will meet the above requirements.

Noise levels from the development's own mechanical and electrical systems will need to be reasonably limited to prevent impacts on suites within the building. These systems should be reviewed at the detail design stage to help prevent the occurrence of any excessive impacts.

There is a loading bay on the ground floor at the north portion of the site, open to suites above. It is anticipated that the loading bay will be used for residential garbage pickup and occasional commercial/retail deliveries, and is therefore not expected to be a significant noise concern.

7 RECOMMENDED WARNING CLAUSES

MECP guidelines recommend that appropriate warning clauses be used in the Development Agreements and in purchase, sale, and lease agreements (typically by reference to the Development Agreements), to inform future owners and occupants about potential noise concerns from sources in the area. The actual wording of the warning clause depends on the nature of the excess. For residential uses, the recommended clauses are as follows:

(a) 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 may on occasion interfere with some activities of the dwelling occupants as the sound levels exceed the sound level limits of the Ministry of Environment, Conservation and Parks.

(b) This dwelling unit has been supplied with a heating and cooling 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 Ministry of the Environment, Conservation and Parks.

(c) Purchasers/tenants are advised that due to the proximity of this development to nearby retail/commercial facilities, sound levels from the facilities may at times be audible.

These sample clauses are provided only as examples, and can be modified by the owner's legal representative, in consultation with the Town, in order to suit site-specific requirements.

8 SUMMARY OF RECOMMENDATIONS

The following list summarizes the recommendations made in this report. The reader is referred to the previous sections of the report where these recommendations are discussed in more detail.

1. Central air conditioning is not required, but is assumed to be provided in any event.
2. Recommended minimum glazing constructions to ensure adequate indoor sound levels from road traffic and other transient noises are outlined in Section 4.4.3.
3. Noise warning clauses should be included in the property and tenancy agreements and offers of purchase and sale for the residential suites to inform future residents of road traffic noise and potential noise from nearby commercial/retail facilities. Recommended wording for these clauses is provided in Section 7. Such clauses are often included by reference to the Development Agreements in which they are contained.
4. Demising assemblies must be selected to meet the minimum requirements of the Ontario Building Code (OBC). Where B19R certification is needed, an acoustical consultant is required to review details of demising constrictions and mechanical/electrical equipment, when available, to help ensure that the noise impact of the development on itself are maintained within acceptable levels. Outdoor sound emissions should also be checked to ensure that any potential impacts on adjacent properties are suitably minimized.

9 CONCLUSION

The results of this study indicate that the proposed development is feasible on this site from a noise impact perspective, with the inclusion of standard acoustical features. Preliminary design recommendations are provided herein, and can be developed in greater detail as the design proceeds through tender and construction.

10 REFERENCES

1. Ontario Ministry of the Environment, Conservation and Parks Publication NPC-300, *Environmental Noise Guideline, Stationary and Transportation Sources - Approval and Planning*, August, 2013.

2. International Organization for Standardization, *Acoustics – Attenuation of Sound during Propagation Outdoors – Part 2: General Method of Calculation*, ISO-9613-2, Switzerland, 1996.

3. Niagara Region Public Works Department Policy Manual, *Regional Road Traffic Noise Control,* November 9, 2006

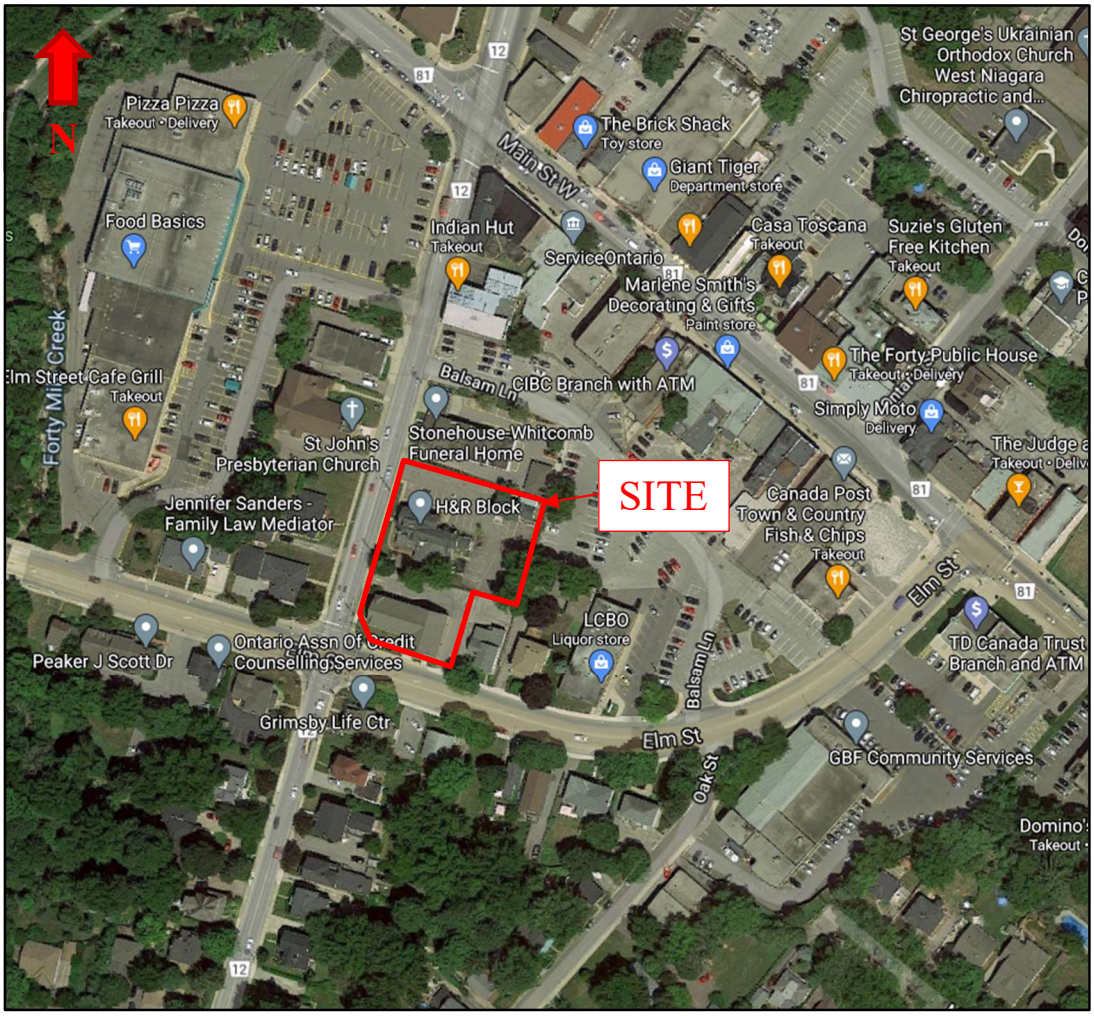


Figure 1: Key Plan

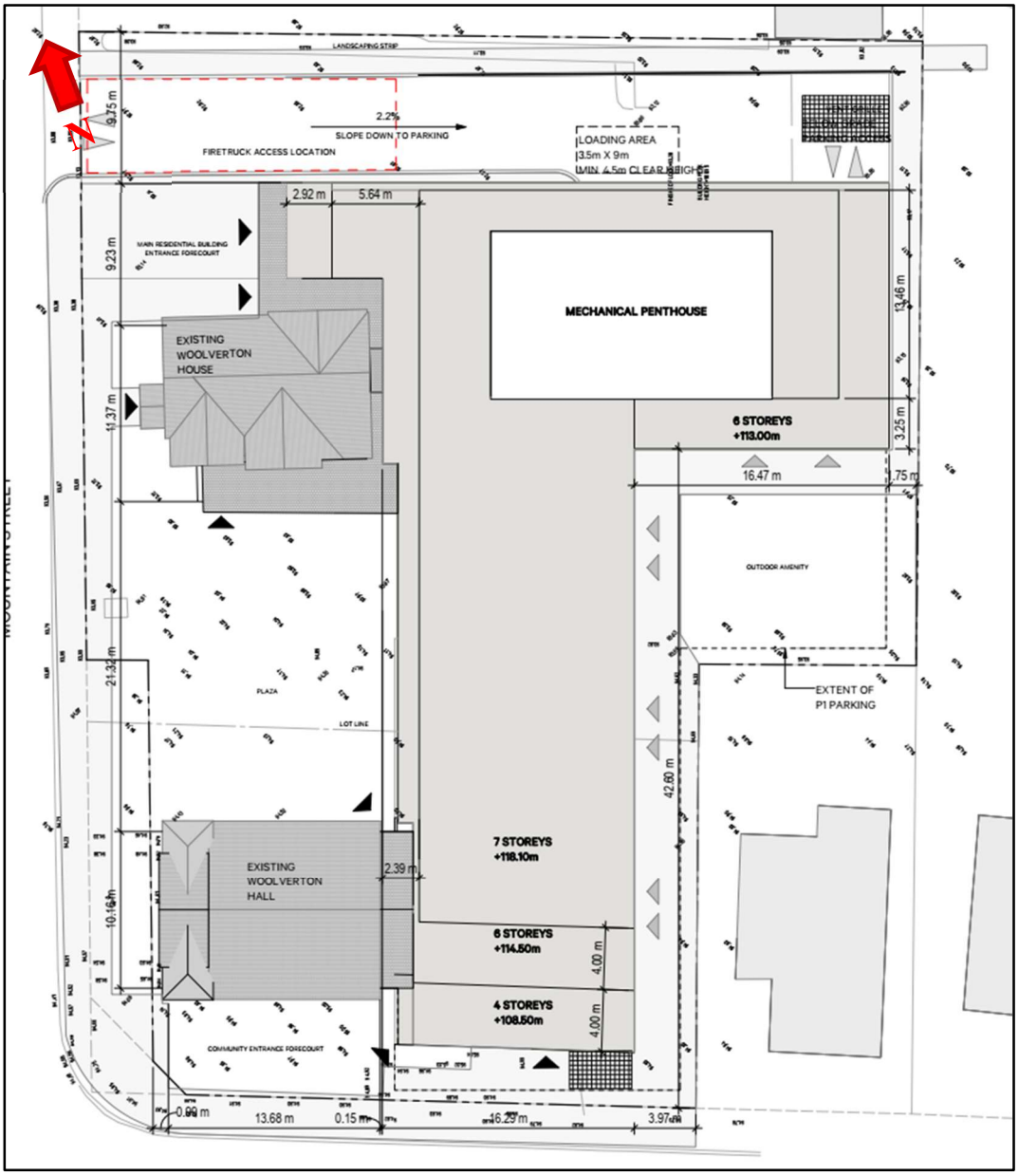


Figure 2: Site Plan

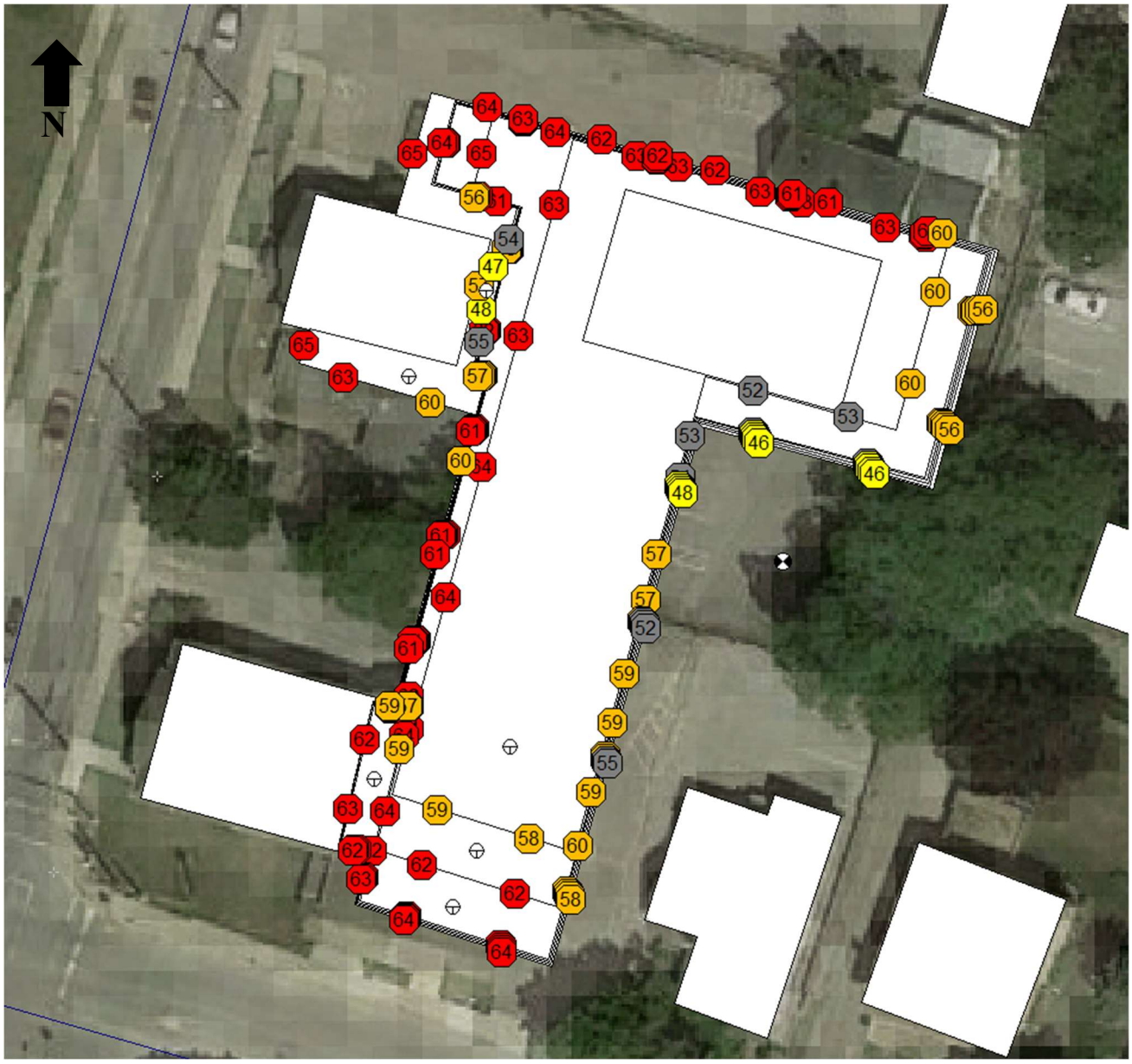


Figure 3: Daytime Sound Level Predictions at Building Façades from Road Traffic

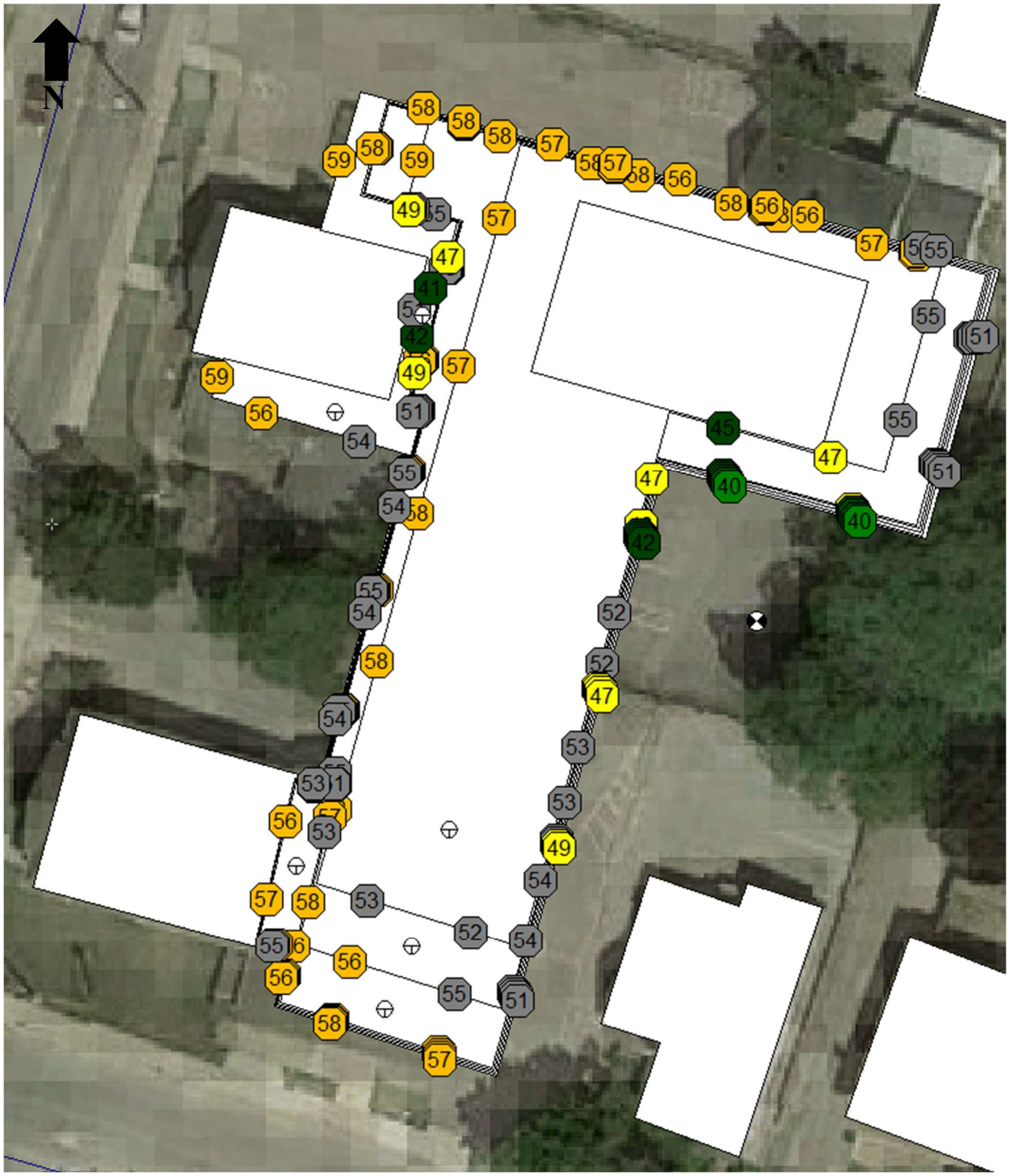


Figure 4: Nighttime Sound Level Predictions at Building Façades from Road Traffic

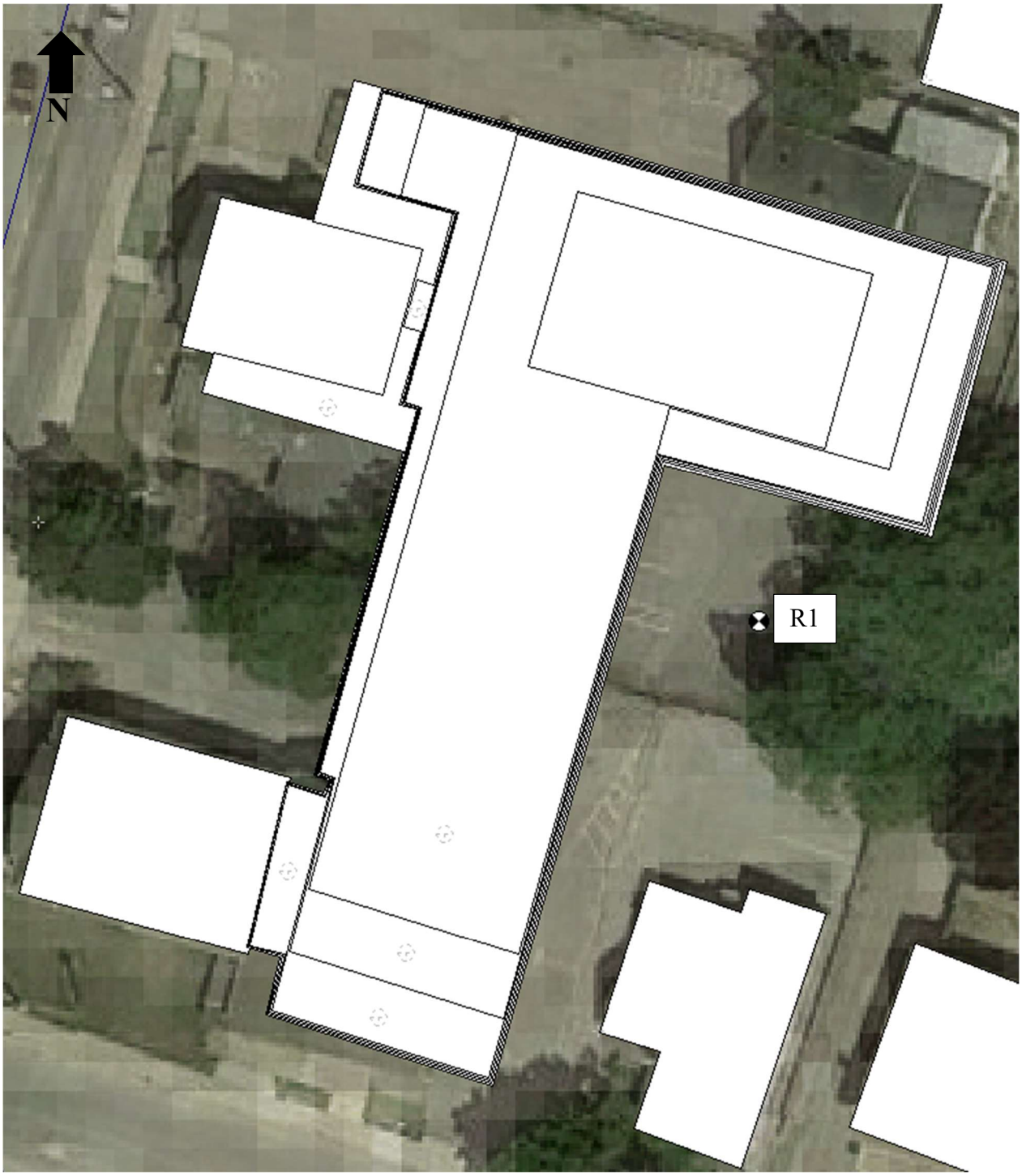


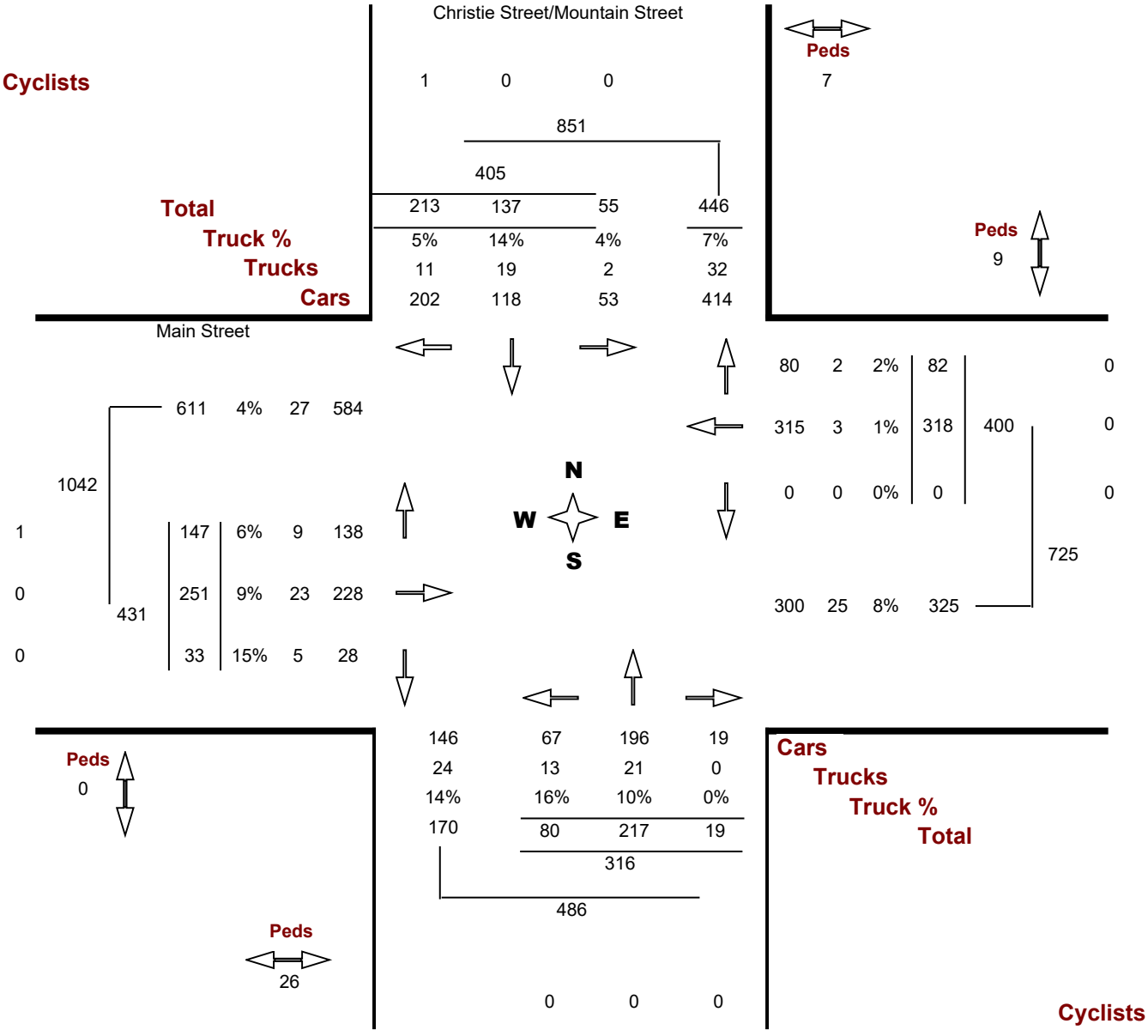
Figure 5: Outdoor Amenity Area Prediction Location

APPENDIX A

Road & Rail Traffic Data

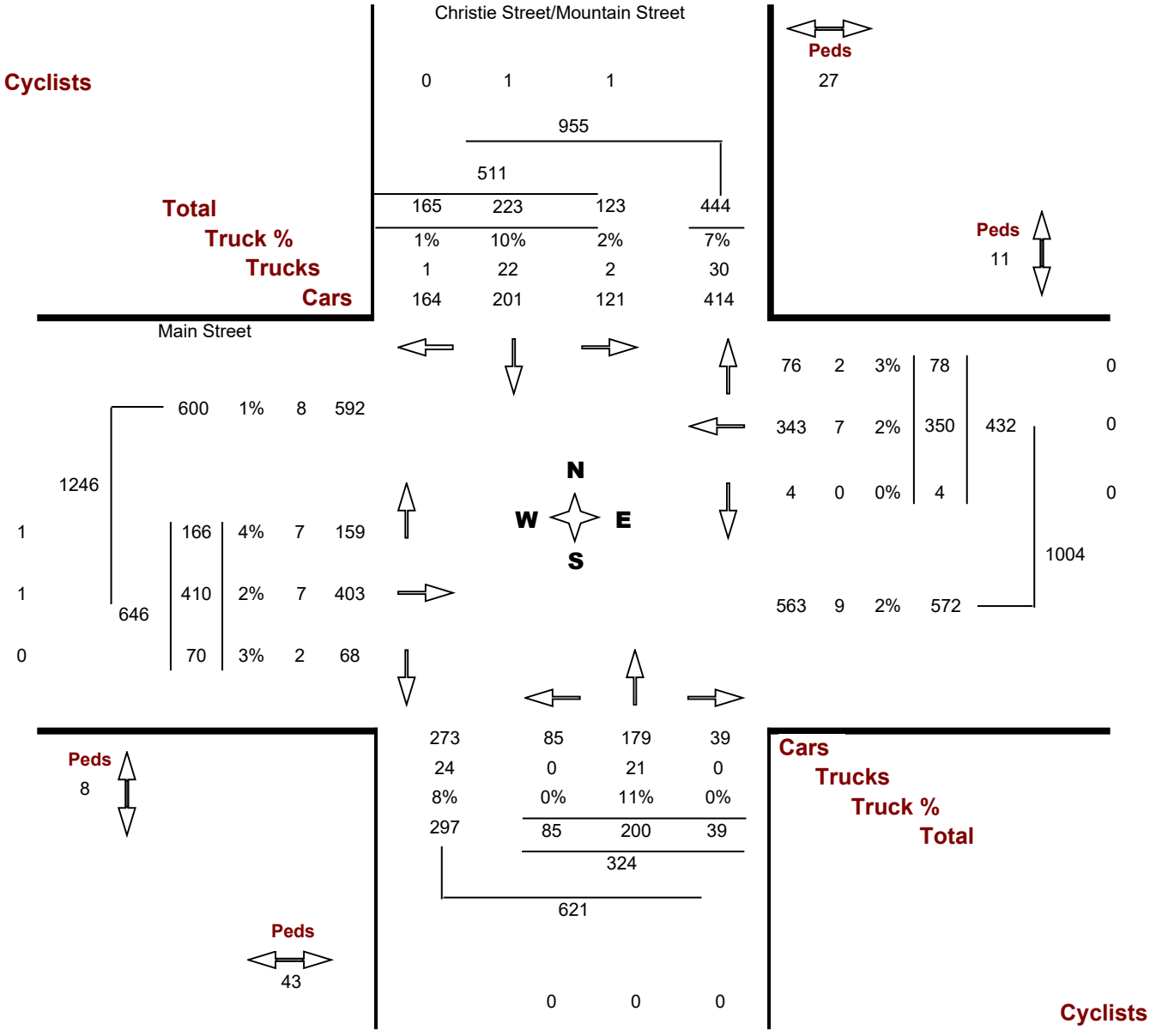
Turning Movements Report - AM Period

Location.....	Christie Street/Mountain Street @ Main Street	**GeoID.....**	01115
Municipality.	GRIMSBY	**Count Date.**	Tuesday, 09 April, 2019
Traffic Cont.		**Count Time.**	07:00 AM — 09:00 AM
Major Dir.....	East west	**Peak Hour..**	08:00 AM — 09:00 AM



Turning Movements Report - PM Period

Location.....	Christie Street/Mountain Street @ Main Street	**GeoID.....**	01115
Municipality.	GRIMSBY	**Count Date.**	Tuesday, 09 April, 2019
Traffic Cont.		**Count Time.**	03:00 PM — 06:00 PM
Major Dir.....	East west	**Peak Hour..**	03:15 PM — 04:15 PM



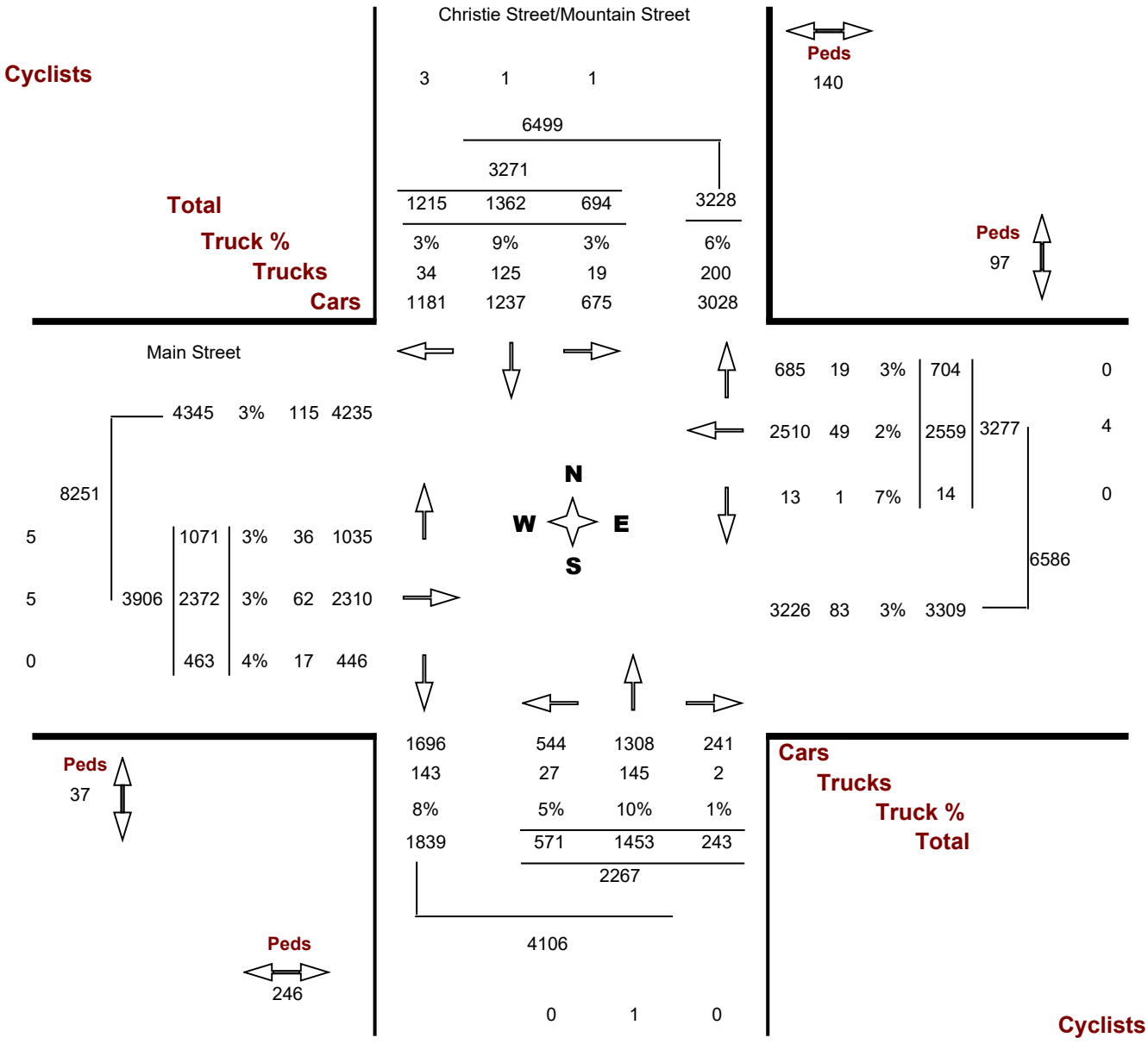
Turning Movement Count Report
Full Study

Location..... Christie Street/Mountain Street @ Main Street

Municipality..... GRIMSBY

GeoID..... 01115

Count Date..... Tuesday, 09 April, 2019



Turning Movement Count - Details Report (15 min)

Location..... Christie Street/Mountain Street @ Main Street

Municipality..... GRIMSBY

Count Date..... Tuesday, April 09, 2019

		Christie Street/Mountain Street											Main Street								
		North Approach					South Approach						East Approach					West Approach				
Time Period		LT	TH	RT	U-Turn	TOT	LT	TH	RT	U-Turn	TOT	LT	TH	RT	U-Turn	TOT	LT	TH	RT	U-Turn	TOT
07:00	07:15	5	23	18	0	46	16	52	2	0	70	0	37	38	0	75	12	19	6	0	37
07:15	07:30	7	28	23	0	58	12	53	0	0	65	0	28	29	0	57	25	32	8	0	65
07:30	07:45	9	19	23	0	51	17	51	4	0	72	0	62	32	0	94	23	33	10	0	66
07:45	08:00	14	36	41	0	91	32	46	1	0	79	0	85	31	0	116	34	65	17	0	116
Hourly Total		35	106	105	0	246	77	202	7	0	286	0	212	130	0	342	94	149	41	0	284
08:00	08:15	12	31	43	0	86	13	55	5	0	73	0	66	27	0	93	35	60	7	0	102
08:15	08:30	8	29	46	0	83	19	56	5	0	80	0	78	22	0	100	29	60	4	0	93
08:30	08:45	16	34	49	0	99	25	53	3	0	81	0	70	17	0	87	33	50	13	0	96
08:45	09:00	19	43	75	0	137	23	53	6	0	82	0	104	16	0	120	50	81	9	0	140
Hourly Total		55	137	213	0	405	80	217	19	0	316	0	318	82	0	400	147	251	33	0	431
11:00	11:15	18	46	33	0	97	27	46	5	0	78	0	69	21	0	90	28	70	8	0	106
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Hourly Total		95	148	147	0	390	83	153	40	0	276	3	351	83	0	437	107	276	70	0	453
15:00	15:15	25	56	42	0	123	19	48	10	0	77	0	91	16	0	107	39	77	19	0	135
15:15	15:30	34	57	45	0	136	19	35	8	0	62	0	97	11	0	108	42	117	17	0	176
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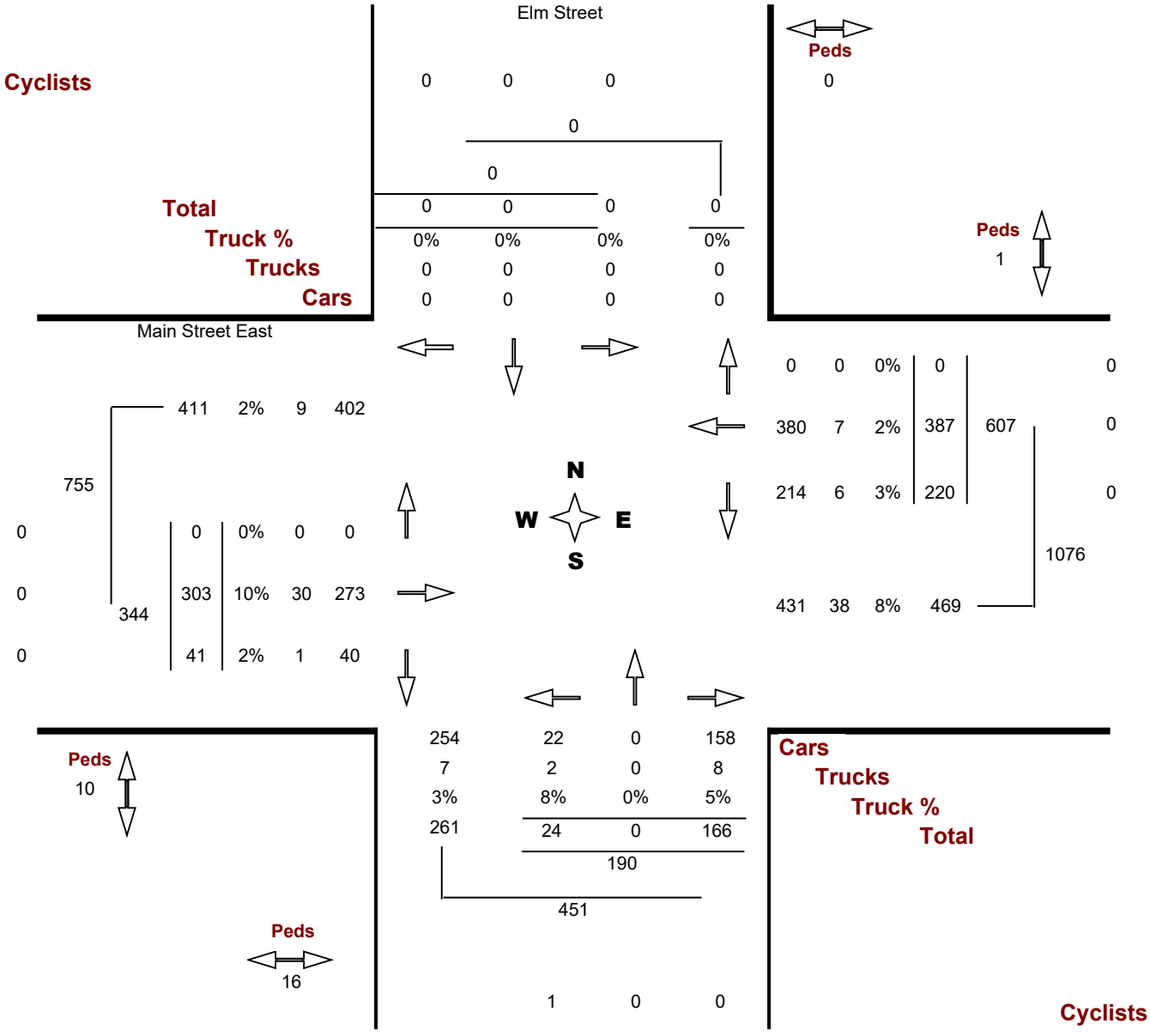
15:45	16:00	25	57	41	0	123	25	50	9	0	84	1	78	14	0	93	37	96	12	0	145
Hourly Total		109	221	162	0	492	87	168	40	0	295	2	351	69	0	422	166	396	70	0	632
16:00	16:15	39	58	45	0	142	17	80	9	0	106	2	90	25	0	117	39	91	19	0	149

		Christie Street/Mountain Street										Main Street									
		North Approach					South Approach					East Approach					West Approach				
Time Period		LT	TH	RT	U-Turn	TOT	LT	TH	RT	U-Turn	TOT	LT	TH	RT	U-Turn	TOT	LT	TH	RT	U-Turn	TOT
16:15	16:30	20	57	43	0	120	9	48	8	0	65	1	94	21	0	116	35	89	22	0	146
16:30	16:45	28	65	35	0	128	20	46	9	0	75	0	89	22	0	111	38	121	20	0	179
16:45	17:00	24	53	34	0	111	11	48	7	0	66	1	92	16	0	109	45	88	20	0	153
Hourly Total		111	233	157	0	501	57	222	33	0	312	4	365	84	0	453	157	389	81	0	627
17:00	17:15	26	71	36	0	133	14	41	11	0	66	0	90	23	0	113	45	90	18	0	153
17:15	17:30	25	66	40	0	131	14	39	9	0	62	0	78	22	0	100	38	75	18	0	131
17:30	17:45	29	55	34	0	118	8	49	13	0	70	1	64	17	0	82	41	76	13	0	130
17:45	18:00	24	46	29	0	99	10	44	4	0	58	0	77	17	0	94	36	72	14	0	122
Hourly Total		104	238	139	0	481	46	173	37	0	256	1	309	79	0	389	160	313	63	0	536
Grand Total		694	1362	1215	0	3271	571	1453	243	0	2267	14	2559	704	0	3277	1071	2372	463	0	3906
Truck %		3%	9%	3%	0%	5%	5%	10%	1%	0%	8%	7%	2%	3%	0%	2%	3%	3%	4%	0%	3%

Turning Movements Report - AM Period

Location..... Elm Street @ Main Street East
Municipality. GRIMSBY
Traffic Cont.
Major Dir..... East west

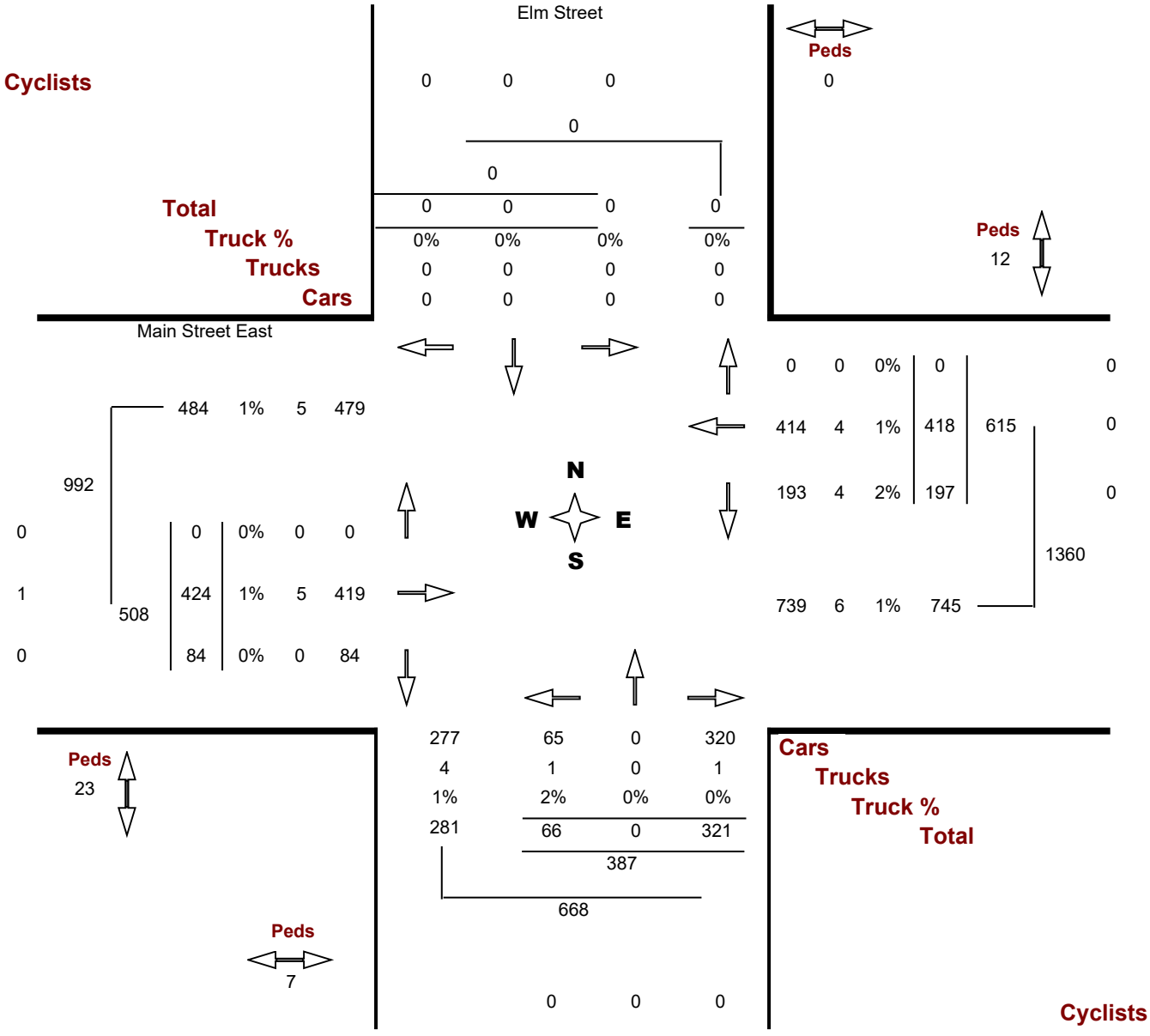
GeoID..... 01110
Count Date. Thursday, 11 April, 2019
Count Time. 07:00 AM — 09:00 AM
Peak Hour.. 07:30 AM — 08:30 AM



Turning Movements Report - PM Period

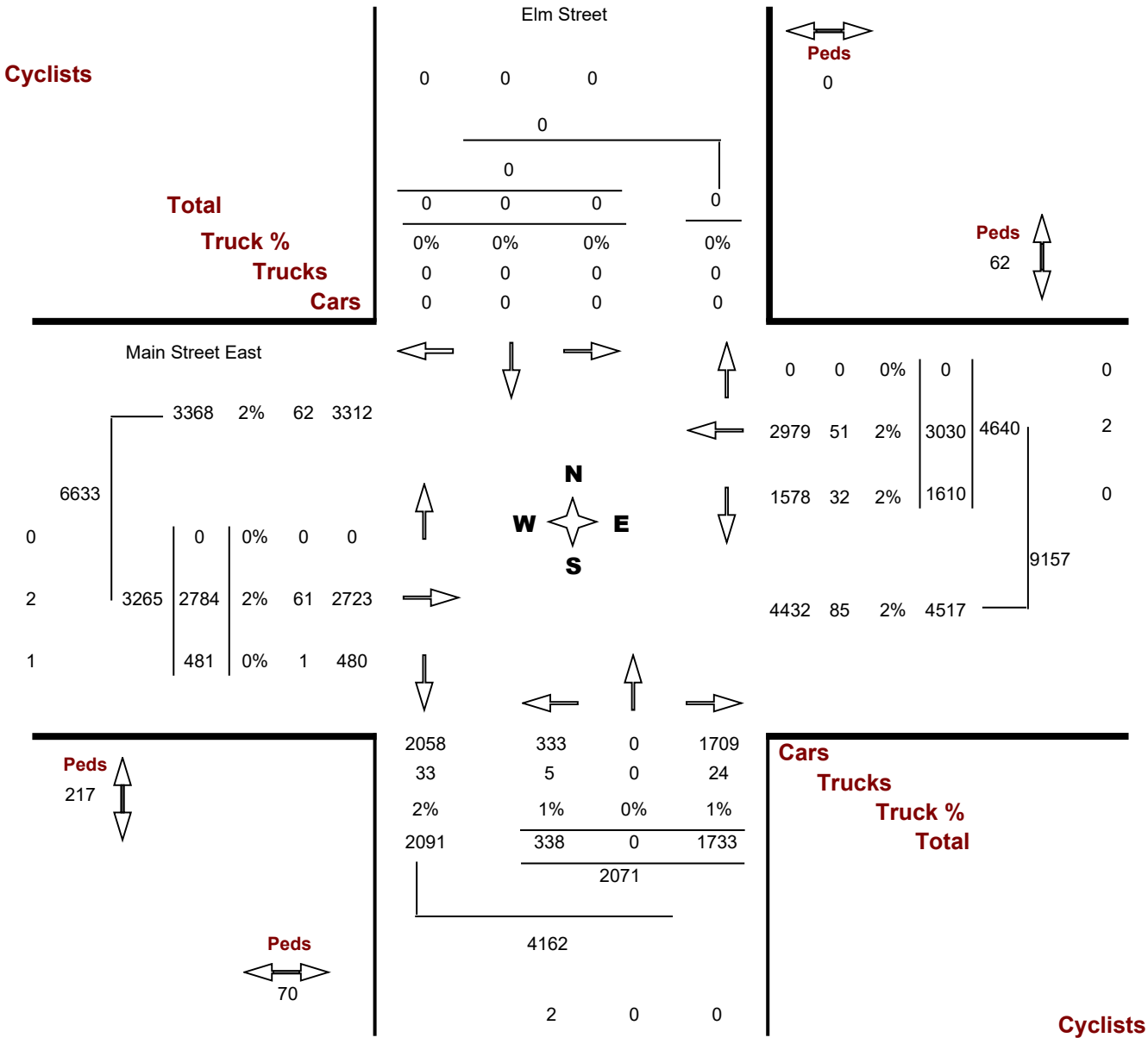
Location..... Elm Street @ Main Street East
Municipality. GRIMSBY
Traffic Cont.
Major Dir..... East west

GeoID..... 01110
Count Date. Thursday, 11 April, 2019
Count Time. 03:00 PM — 06:00 PM
Peak Hour.. 03:00 PM — 04:00 PM



Turning Movement Count Report
Full Study

Location..... Elm Street @ Main Street East
Municipality..... GRIMSBY
GeoID..... 01110
Count Date..... Thursday, 11 April, 2019



Turning Movement Count - Details Report (15 min)

Location..... Elm Street @ Main Street East

Municipality..... GRIMSBY

Count Date..... Thursday, April 11, 2019

		Elm Street										Main Street East									
		North Approach					South Approach					East Approach					West Approach				
Time Period		LT	TH	RT	U-Turn	TOT	LT	TH	RT	U-Turn	TOT	LT	TH	RT	U-Turn	TOT	LT	TH	RT	U-Turn	TOT
07:00	07:15	0	0	0	0	0	5	0	36	0	41	40	90	0	0	130	0	70	3	0	73
07:15	07:30	0	0	0	0	0	5	0	30	0	35	39	79	0	0	118	0	49	4	0	53
07:30	07:45	0	0	0	0	0	8	0	28	0	36	57	93	0	0	150	0	51	9	0	60
07:45	08:00	0	0	0	0	0	8	0	43	0	51	72	112	0	0	184	0	76	13	0	89
Hourly Total		0	0	0	0	0	26	0	137	0	163	208	374	0	0	582	0	246	29	0	275
08:00	08:15	0	0	0	0	0	2	0	52	0	54	48	93	0	0	141	0	104	13	0	117
08:15	08:30	0	0	0	0	0	6	0	43	0	49	43	89	0	0	132	0	72	6	0	78
08:30	08:45	0	0	0	0	0	6	0	29	0	35	34	86	0	0	120	0	68	12	0	80
08:45	09:00	0	0	0	0	0	7	0	36	0	43	41	85	0	0	126	0	64	8	0	72
Hourly Total		0	0	0	0	0	21	0	160	0	181	166	353	0	0	519	0	308	39	0	347
11:00	11:15	0	0	0	0	0	11	0	52	0	63	38	103	0	0	141	0	84	26	0	110
11:15	11:30	0	0	0	0	0	5	0	45	0	50	69	92	0	0	161	0	95	12	0	107
11:30	11:45	0	0	0	0	0	9	0	54	0	63	58	106	0	0	164	0	76	17	0	93
11:45	12:00	0	0	0	0	0	16	0	59	0	75	67	106	0	0	173	0	84	26	0	110
Hourly Total		0	0	0	0	0	41	0	210	0	251	232	407	0	0	639	0	339	81	0	420
12:00	12:15	0	0	0	0	0	18	0	45	0	63	53	78	0	0	131	0	103	13	0	116
12:15	12:30	0	0	0	0	0	18	0	62	0	80	54	80	0	0	134	0	77	18	0	95
12:30	12:45	0	0	0	0	0	14	0	56	0	70	68	99	0	0	167	0	71	14	0	85
12:45	13:00	0	0	0	0	0	20	0	76	0	96	56	104	0	0	160	0	70	21	0	91
Hourly Total		0	0	0	0	0	70	0	239	0	309	231	361	0	0	592	0	321	66	0	387
13:00	13:15	0	0	0	0	0	14	0	56	0	70	63	100	0	0	163	0	87	21	0	108
13:15	13:30	0	0	0	0	0	7	0	57	0	64	63	83	0	0	146	0	100	15	0	115
13:30	13:45	0	0	0	0	0	6	0	47	0	53	47	85	0	0	132	0	104	16	0	120
13:45	14:00	0	0	0	0	0	11	0	62	0	73	54	91	0	0	145	0	86	11	0	97
Hourly Total		0	0	0	0	0	38	0	222	0	260	227	359	0	0	586	0	377	63	0	440
15:00	15:15	0	0	0	0	0	11	0	87	0	98	47	119	0	0	166	0	96	21	0	117
15:15	15:30	0	0	0	0	0	22	0	75	0	97	51	93	0	0	144	0	97	26	0	123
15:30	15:45	0	0	0	0	0	18	0	77	0	95	57	99	0	0	156	0	122	19	0	141
15:45	16:00	0	0	0	0	0	15	0	82	0	97	42	107	0	0	149	0	109	18	0	127
Hourly Total		0	0	0	0	0	66	0	321	0	387	197	418	0	0	615	0	424	84	0	508
16:00	16:15	0	0	0	0	0	10	0	73	0	83	49	119	0	0	168	0	95	14	0	109

		Elm Street										Main Street East									
		North Approach					South Approach					East Approach					West Approach				
Time Period		LT	TH	RT	U-Turn	TOT	LT	TH	RT	U-Turn	TOT	LT	TH	RT	U-Turn	TOT	LT	TH	RT	U-Turn	TOT
16:15	16:30	0	0	0	0	0	10	0	66	0	76	58	115	0	0	173	0	110	18	0	128
16:30	16:45	0	0	0	0	0	9	0	58	0	67	45	91	0	0	136	0	111	9	0	120
16:45	17:00	0	0	0	0	0	12	0	59	0	71	41	107	0	0	148	0	108	22	0	130
Hourly Total		0	0	0	0	0	41	0	256	0	297	193	432	0	0	625	0	424	63	0	487
17:00	17:15	0	0	0	0	0	11	0	60	0	71	38	81	0	0	119	0	89	18	0	107
17:15	17:30	0	0	0	0	0	7	0	41	0	48	44	77	0	0	121	0	91	12	0	103
17:30	17:45	0	0	0	0	0	13	0	50	0	63	34	74	0	0	108	0	75	13	0	88
17:45	18:00	0	0	0	0	0	4	0	37	0	41	40	94	0	0	134	0	90	13	0	103
Hourly Total		0	0	0	0	0	35	0	188	0	223	156	326	0	0	482	0	345	56	0	401
Grand Total		0	0	0	0	0	338	0	1733	0	2071	1610	3030	0	0	4640	0	2784	481	0	3265
Truck %		0%	0%	0%	0%	0%	1%	0%	1%	0%	1%	2%	2%	0%	0%	2%	0%	2%	0%	0%	2%

Highway	Location Description	Dist. (KM)	Year	Pattern Type	AADT	SADT	SAWDT	WADT	AR
			2014	IC	101,200	112,400	111,400	90,100	N/A
			2015	IC	103,100	114,400	113,400	91,800	N/A
			2016	IC	105,100	116,600	115,600	93,500	N/A
QEW	ONTARIO ST IC-64	3.8	1988	IC	50,300	65,300	61,300	42,200	0.5
			1989	IC	52,400	66,500	63,400	45,000	0.5
			1990	IC	55,500	69,300	65,400	48,200	0.4
			1991	IC	57,200	72,000	71,400	49,700	0.7
			1992	IC	57,000	71,800	68,900	48,400	0.5
			1993	IC	57,600	70,800	68,500	50,100	0.7
			1994	IC	63,900	81,800	78,000	53,900	0.5
			1995	IC	66,700	85,400	82,000	56,200	0.4
			1996	IC	69,500	89,000	85,500	58,600	0.4
			1997	IC	72,200	92,400	88,800	60,900	0.2
			1998	IC	75,000	95,300	91,500	63,200	0.2
			1999	IC	73,400	92,500	88,900	61,900	0.2
			2000	IC	74,900	94,400	90,700	63,200	0.3
			2001	IC	76,400	96,300	92,400	64,200	0.2
			2002	IC	77,900	98,300	94,300	65,800	0.3
			2003	IC	78,300	98,700	94,700	66,600	0.3
			2004	IC	81,100	100,800	96,900	68,800	0.2
			2005	IC	83,100	103,000	98,800	70,500	0.3
			2006	IC	84,400	104,500	100,200	71,600	0.2
			2007	IC	85,600	106,000	105,100	72,600	0.2
			2008	IC	87,800	108,700	106,500	74,600	0.2
			2009	IC	89,500	109,500	105,200	76,000	0.1
			2010	IC	90,300	109,900	105,600	76,700	0.2
			2011	IC	92,100	112,400	107,800	78,300	N/A
			2012	IC	93,600	113,300	112,400	79,600	N/A
			2013	IC	95,200	116,100	119,900	80,900	N/A
			2014	IC	96,700	107,400	106,400	86,100	N/A
			2015	IC	98,300	109,100	108,100	87,500	N/A
			2016	IC	99,800	110,800	109,800	88,800	N/A
QEW	BARTLETT AV IC-68	2.5	1988	CTR	52,600	68,300	64,100	44,100	0.5

Highway	Location Description	Dist. (KM)	Year	Pattern Type	AADT	SADT	SAWDT	WADT	AR
			1989	CTR	54,900	69,700	66,400	47,200	0.8
			1990	CTR	57,100	71,300	67,300	49,600	0.5
			1991	CTR	58,800	74,000	73,500	51,100	0.7
			1992	CTR	57,600	72,500	69,600	48,900	0.3
			1993	CTR	58,200	71,500	69,200	50,600	0.4
			1994	CTR	58,500	74,900	71,400	49,300	0.5
			1995	CTR	63,800	81,700	78,500	53,800	0.5
			1996	CTR	70,200	89,900	86,300	59,200	0.4
			1997	CTR	70,500	90,200	86,700	59,400	0.3
			1998	CTR	73,900	93,900	90,200	62,300	0.3
			1999	CTR	75,900	95,700	91,900	64,000	0.2
			2000	CTR	76,400	96,300	92,500	64,400	0.3
			2001	CTR	78,700	99,200	95,200	66,100	0.2
			2002	CTR	80,100	101,100	96,900	67,600	0.4
			2003	CTR	81,800	103,100	99,000	69,500	0.4
			2004	CTR	85,100	105,800	101,600	72,200	0.3
			2005	CTR	84,900	105,200	101,000	72,000	0.3
			2006	CTR	84,100	104,100	99,800	71,400	0.2
			2007	CTR	87,900	108,900	107,900	74,500	0.2
			2008	CTR	87,400	108,200	106,100	74,300	0.3
			2009	CTR	91,500	112,000	107,600	77,700	0.1
			2010	CTR	91,100	110,900	106,600	77,400	0.1
			2011	CTR	95,100	116,000	111,300	80,800	N/A
			2012	CTR	86,500	96,000	92,500	77,000	N/A
			2013	CTR	96,500	107,100	106,200	85,900	N/A
			2014	CTR	98,100	108,900	108,000	87,300	N/A
			2015	CTR	88,400	107,800	108,700	75,100	N/A
			2016	CTR	99,300	121,200	122,200	84,400	N/A
QEW	MAPLE AV IC-71	3.6	1988	IC	47,300	61,400	57,700	39,700	0.6
			1989	IC	49,300	62,600	59,600	42,300	1.0
			1990	IC	51,300	64,100	60,500	44,600	0.7
			1991	IC	52,900	66,500	66,000	45,900	1.0
			1992	IC	52,800	66,500	63,800	44,800	0.6

System Engineering
Engineering Services

1 Administration Road
Concord, ON, L4K 1B9
T: 905.669.3264
F: 905.760.3406

Train Count Data

TRANSMITTAL

To: *Destinataire :*	HGC Engineering 2000 Argentia Rd Plaza, Suite 203, Mississauga, ON L5N 1P7	*Project :*	GRM-17.19- Jordan Road, Lincoln ON
Att'n:	Victor Garcia	*Routing:*	vgarcia@hgcengineering.com
From: *Expéditeur :*	Michael Vallins	*Date:*	12/18/2020
Cc:	Adjacent Development CN via e-mail		

☐ Urgent ☐ For Your Use ☐ For Review ■ For Your Information ☐ Confidential

Re: Train Traffic Data – CN Grimsby Subdivision near GRM-17.19-Jordan Road, Lincoln ON

Please find attached the requested Train Traffic Data; this data does not reflect GO Metrolinx Traffic. The application fee in the amount of **$500.00** +HST will be invoiced.

Should you have any questions, please do not hesitate to contact the undersigned at permits.gld@cn.ca.

Sincerely,
CN Design & Construction

Michael Vallins P.Eng
Manager, Public Works- Eastern Canada
Permits.gld@cn.ca

Date: 2020/12/18 Project Number: GRM-17.19- Jordan Road, Lincoln ON

Dear Victor:

Re: Train Traffic Data – CN Grimsby Subdivision GRM-17.19- Jordan Road, Lincoln ON

The following is provided in response to Victor's 2020/10/08 request for information regarding rail traffic in the vicinity of 2797 Red Maple Avenue in Lincoln at approximately Mile 17.19 on CN's Grimsby Subdivision.

Typical daily traffic volumes are recorded below. However, traffic volumes may fluctuate due to overall economic conditions, varying traffic demands, weather conditions, track maintenance programs, statutory holidays and traffic detours that when required may be heavy although temporary. For the purpose of noise and vibration reports, train volumes must be escalated by 2.5% per annum for a 10-year period.

Typical daily traffic volumes at this site location are as follows:

***Maximum train speed is given in Miles per Hour**

	0700-2300			
Type of Train	Volumes	Max.Consist	Max. Speed	Max. Power
Freight	4	140	60	4
Way Freight	0	25	60	4
Passenger	2	10	65	2

	2300-0700			
Type of Train	Volumes	Max.Consist	Max. Speed	Max. Power
Freight	0	140	60	4
Way Freight	0	25	60	4
Passenger	0	10	65	2

The volumes recorded reflect westbound and eastbound freight and passenger operations on CN's Grimsby Subdivision.

Except where anti-whistling bylaws are in effect, engine-warning whistles and bells are normally sounded at all at-grade crossings. There are two (2) at-grade crossings in the immediate vicinity of the study area at Mile 16.65 (15th Street South) and Mile 18.13 (Lynden Road). Anti-whistling bylaws are not in effect at these crossings. Please note that engine warning whistles may be sounded in cases of emergency, as a safety and or warning precaution at station locations and pedestrian crossings and occasionally for operating requirements. There is no switch in the immediate vicinity of the study area.

With respect to equipment restrictions, the gross weight of the heaviest permissible car is 286,000 lbs.

The single mainline track is considered continuously welded rail throughout the study area.

Canadian National Railway continues to be strongly opposed to locating developments near railway facilities and rights-of-way due to potential safety and environmental conflicts. Development adjacent to the Railway Right-of-Way is not appropriate without sound impact mitigation measures to reduce the incompatibility. For confirmation of the applicable rail noise, vibration and safety standards, Adjacent Development, Canadian National Railway Properties at Proximity@cn.ca should be contacted directly.

I trust the above information will satisfy your current request.

Sincerely,

Michael Vallins P.Eng
Manager, Public Works- Eastern Canada
Permits.gld@cn.ca