

APPENDIX I

Environmental Noise Assessment Adelaide Street North Class Environmental Assessment City of London

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Final Version 1.1

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1.0 INTRODUCTION

Novus Environmental Inc. (Novus) was retained by Parsons Inc. to conduct an environmental noise impact assessment in the City of London, Ontario for the proposed Adelaide Street North widening from Fanshawe Park Road East to north of Sunningdale Road East. Also included in the study are improvements to Sunningdale Road East, east and west of Adelaide Street North.

The objectives of this study are as follows:

- to assess future “build” and “no-build” sound levels from road traffic noise sources in the area (i.e., noise levels with and without the proposed project taking place);
- to use these predictions to assess potential impacts according to the applicable guidelines;
- to specify mitigation measures where required; and
- to assess the potential for construction noise and provide a Code of Practice to minimize potential impacts.

A glossary of common terms and a description of transportation sound basics can be found in **Appendix A**.

1.1 Project Description (Nature of the Undertaking)

The proposed roadway improvements are in the City of London. The Study Area includes the following improvements to accommodate future growth:

- Widen and realign Adelaide Street North from Fanshawe Park Road East to north of Sunningdale Road East; and
- Improvements at the Adelaide Street North / Sunningdale Road East intersection.

The overview of the study area for the project is shown in **Figure 1**. The specific area for roadway improvements is shown in **Figure 2**.

2.0 ROAD TRAFFIC NOISE IMPACTS (OPERATIONAL NOISE)

For roadway projects, operational noise is of primary importance. This section of the report provides an analysis of operational noise impacts from road traffic noise related to this undertaking.

2.1 Applicable Guidelines

There are several transportation noise guidelines that are applicable to this project. Ontario

Provincial policies and guidelines from the Ontario Ministry of Transportation (MTO) and the Ontario Ministry of the Environment, Conservation and Parks (MECP) are directly applicable under the Municipal Class EA process for transportation projects and are discussed in detail in this report.

2.1.1 Ontario Provincial Guidelines and Policies

Ontario has several guidelines and documents related to assessing road traffic noise impacts. The document most applicable to municipal roadway projects is:

- Ontario MECP/MTO, “Joint Protocol”, *A Protocol for Dealing with Noise concerns during the Preparation, Review and Evaluation of Provincial Highway’s Environmental Assessments* (MTO & MECP, 1986)

In May 2007, the MTO released the *Environmental Guide for Noise* (MTO, 2006) which superseded the Joint Protocol and previous MTO *Quality and Standards Directive QST-A1 Noise Policy and Acoustic Standards for Provincial Highways* (MTO 1992). Currently the *Environmental Guide for Noise* (the Guide) has not been adopted by the MECP for municipal projects. Therefore, the Joint Protocol has been used for this study. A summary of the effort required under the Joint Protocol is shown in **Table 1**.

The Joint Protocol sets out an Outdoor Objective sound level of 55 dBA L_{eq} , or the existing ambient. For sound levels less than 65 dBA either the Guide or the Joint Protocol assesses noise impacts in a similar manner. Only in the case where sound levels exceed 65 dBA, is the Guide more stringent. The evaluation of noise impacts is determined by the change in cumulative sound levels from the 2039 “no-build” scenario to the future “build” scenario. Assessments are based on a minimum 10-year future horizon year (i.e., traffic volumes 10 years after the completion of the project). Accordingly, a design year of 2039 applies to this project, corresponding to the traffic forecasts provided by Parsons.

Noise mitigation is warranted when increases in sound level over the “no-build” ambient are greater than 5 dBA. Mitigation measures can include changes in vertical profiles and horizontal alignments and noise barriers. Noise mitigation, where applied, must be administratively, economically, and technically feasible, and must provide at least 5 dBA of reduction averaged over the first row of noise-sensitive receivers. Mitigation measures are restricted to within the roadway right-of-way. Off right-of-way noise mitigation, such as window upgrades and air conditioning, is not considered.

2.1.2 City of London Guidelines

The City of London’s *Design Specifications & Requirements Manual* specifies how noise barriers are to be constructed if they are required.

Table 1: Summary of Mitigation Efforts Under the MECP/MTO Joint Protocol

Future Sound Levels	Change in Noise Level Above Future “No-Build” Ambient (dBA)	Mitigation Effort Required
< 55 dBA	0 to 5	None
	> 5	
> 55 dBA	0 to 5	<ul style="list-style-type: none"> Investigate noise control measures within right-of-way Noise control measures where used must provide a minimum of 5 dBA of attenuation, averaged over the first row of receivers Mitigated to as close to ambient as possible, where technically, economically and administratively feasible
	> 5	

Notes: Values are L_{eq} (16h) levels for municipal roads

2.2 Location of Noise Sensitive Areas Within the Study Area

2.2.1 Definition of Noise Sensitive Areas

Noise impacts from transportation projects are evaluated at noise sensitive receptors commonly referred to as Noise Sensitive Areas (NSAs). Under the Joint Protocol, NSAs include the following land uses, provided they have an Outdoor Living Area (OLA) associated with them:

- Private homes (single family units and townhouses)
- Multiple unit buildings such as apartments, provided they have a communal OLA associated with them
- Hospitals and nursing homes for the aged, provided they have an OLA for use by patients
- Schools, educational facilities, and daycare centres where there are OLAs for students
- Campgrounds that provide overnight accommodation
- Hotels and motels with outdoor communal OLAs for visitors
- Churches and places of worship

The following land uses are generally not considered to qualify as NSAs:

- Apartment balconies
- Cemeteries
- Parks and picnic areas not part of a defined OLA
- All commercial
- All industrial

2.2.2 Representative NSAs for Analysis

Several NSAs have been used in the analysis to represent worst-case potential noise impacts at all nearby noise sensitive land uses within the study area. NSAs were picked to assess areas with similar overall noise levels and similar changes in noise (“build” versus “no-build”). These NSAs and modelled receptor locations are described in **Table 2**.

Table 2: Representative NSAs Considered in Analysis

Receptor Location	Type of NSA	Description
Rec 1	Multi Unit Townhome	601 Grenfell Drive, Unit 19
Rec 2	Multi Unit Townhome	601 Grenfell Drive, Unit 14
Rec 3	Multi Unit Townhome	601 Grenfell Drive, Unit 7
Rec 4	Multi Unit Townhome	2081 Phillbrook Drive, Unit 18
Rec 5	Multi Story Apartment	600 Grenfell Drive
Rec 6	Multi Story Apartment	600 Grenfell Drive
Rec 7	Multi Unit Townhome	30 Silverbrook Drive, Unit 32
Rec 8	Multi Unit Townhome	30 Silverbrook Drive, Unit 37
Rec 9	Multi Unit Townhome	30 Silverbrook Drive, Unit 52
Rec 10	Single Family Residential	513 Sprucewood Drive
Rec 11	Single Family Residential	510 Sprucewood Drive
Rec 12	Multi Unit Townhome	1853 Blackwater Road, Unit 35
Rec 13	Multi Unit Townhome	1853 Blackwater Road, Unit 25
Rec 14	Single Family Residential	859 Garibaldi Avenue
Rec 15	Single Family Residential	889 Garibaldi Avenue
Rec 16	Single Family Residential	911 Garibaldi Avenue
Rec 17	Multi Unit Townhome	572 Thistlewood Drive, Unit 50
Rec 18	Long Term Care Residence	2000 Blackwater Road
Rec 19	Multi Unit Townhome	2235 Blackwater Road, Unit 16
Rec 20	Multi Story Apartment	2230 Sunningdale Road East
Rec 21	Multi Unit Townhome	620 Thistlewood Drive, Unit 34
Rec 22	Multi Unit Townhome	620 Thistlewood Drive, Unit 48

The OLA may be situated on any side of the receptor but is generally taken to be in the back yard. For assessment purposes, the OLA is taken as a point 3 m from the façade of the receptor, and 1.5 m (approximate head-height) above the ground surface to be consistent with MECP policy. The locations of the representative noise receivers used in the analysis are shown in **Figures 3 to 7**.

2.3 Study Horizons

Under the Joint Protocol a “noise impact” is defined as the difference in projected noise level changes comparing the noise levels a minimum of 10 years after construction between the “no build” and “build” scenarios. The year 2039 is the best available traffic volume to model the future “no build” scenario and for the future “build” condition and to assess possible noise impacts.

2.4 Study Scenarios

As mentioned above, the “noise impact” for the study area is defined as the difference in projected noise levels between the “no build” and “build” scenarios.

2.5 Road Traffic Data

Traffic volumes for the 2039 “no-build” and “build” scenarios for multiple roadways were provided by Parsons and are found in **Appendix B**. The data is further summarized in **Table 3**. The traffic volumes are the same for both scenarios. Traffic data was provided in the form of Annual Average Daily Traffic (AADT) or in AM and PM peak hour turning movement counts. The commercial vehicle counts were derived from the AM and PM turning movement counts. A conservative Medium Truck / Heavy truck split of 50/50 was used in this study which is based on historical information for these types of roadways.

Table 3: Road Traffic Data for 2039 Future “No-build” and “Build” Scenarios

Road and Section	AADT	Day / Night Split ^[1]	Overall % Commercial Vehicles	Medium / Heavy Truck Split ^{[2], [3]}	Posted Speed Limit (km/h)
Adelaide St. North					
South of Fanshawe Park Rd. East	34,100	90/10	2.8	1.4/1.4	60
Fanshawe Park Rd. East to Grenfell Dr.	31,900	90/10	2.3	1.2/2.2	60
Grenfell Dr. to Blackwater Rd.	25,500	90/10	2.7	1.4/1.4	60
Blackwater Rd. to Sunningdale Rd. East	23,800	90/10	2.0	1.0/1.0	60
Sunningdale Rd. East to Street A	13,000	90/10	1.9	0.9/0.9	60
North of Street A	9,000	90/10	1.8	0.9/0.9	80
Fanshawe Park Rd. East					
West of Adelaide St. North	34,000	90/10	3.1	1.6/1.6	60
East of Adelaide St. North	27,400	90/10	2.6	1.3/1.3	60
Grenfell Dr.					
East of Adelaide St. North	6,100	90/10	2.6	1.3/1.3	50
Phillbrooke Dr.					
West of Adelaide St. North	4,300	90/10	3.3	1.6/1.6	50
Blackwater Rd.					
West of Adelaide St. North	1,900	90/10	5.5	2.8/2.8	50
East of Adelaide St. North	3,100	90/10	2.2	1.1/1.1	50
Sunningdale Rd. East					
West of Adelaide St. North	26,000	90/10	3.4	1.7/1.7	60
East of Adelaide St. North	22,900	90/10	3.7	1.9/1.9	60

Notes: [1] The percentage of vehicle traffic in the 16-hour daytime and 8-hour night-time respectively.
 [2] The percentage of medium trucks and heavy trucks used in the analysis, respectively.
 [3] Medium / Heavy Truck Split of 50/50. Numbers may display differently due to rounding.

2.6 Noise Model Used

The highway noise prediction model used is the United States Federal Highway Administration Method. The MECP STAMSON highway noise prediction model is a simplified computerized version of this method. This model is jointly approved by the MTO and the MECP.

The noise prediction model relies on the use of vehicle noise emission levels to generate a noise source that can then be assessed at the noise receptors based on the following factors:

- speeds for the roadways in the area used in the noise analysis;
- pavement surface used for construction of the roadway (i.e. hot mix asphaltic pavement);
- elevations, contours and locations of all the NSA's near the right-of-way;
- roadway grades;
- intervening rows of homes and barriers;
- type of ground cover, soft or hard ground;
- percentage of commercial traffic; and
- distance from the roadway.

The model uses the following vehicle classifications:

Automobiles - Two axles and four wheels designed primarily for the transportation of nine or fewer passengers, or transportation of cargo (light trucks). This classification includes motorcycles. Generally, the gross vehicle weight is less than 4,500 kilograms.

Medium trucks - Two axles and six wheels designed for the transportation of cargo. Generally, the gross vehicle weight is greater than 4,500 kilograms but less than 12,000 kilograms.

Heavy trucks - Three or more axles and designed for the transportation of cargo. Generally, the gross vehicle weight is greater than 12,000 kilograms.

Distances, roadway heights, existing noise barriers and receptor locations were obtained from plan drawings supplied by Parsons, a field visit and aerial photographs.

2.7 Detailed Modelling

Table 4 presents a comparison of “no build” versus future “build” sound levels at receptors in the study area during the 16-hour day. Drawings showing the technically preferred “build” alternative are shown in **Appendix C**. There were several existing noise barriers along roadways within the project limits. The locations and heights of these walls are shown in the **Figures 3 to 7**. The sound levels shown in **Table 4** take these walls into account in the calculation of the noise levels. There is an assumption that the walls are still acoustically

effective. This would be the case for all the brick and masonry walls. Some of the older wooden noise barrier walls may have some noise leakage between the boards and under the walls. The evaluation of the acoustical effectiveness of these noise barriers is beyond the scope of this environmental assessment study. A sample of the Stamson input information and results can be found in **Appendix D**.

Table 4: 2039 “No Build” and “Build” Noise Levels

Receptor Location	Approximate Number of NSAs Represented	“No Build” L _{eq} (16h)	“Build” L _{eq} (16h)	Change (“Build” minus “No-Build”)	Increase Above 5 dBA
Rec 1	5	58.5	58.4	-0.1	No
Rec 2	6	58.4	58.1	-0.3	No
Rec 3	6	58.6	58.6	0.0	No
Rec 4	16	62.9	63.2	0.3	No
Rec 5	5	62.7	62.7	0.0	No
Rec 6	6	62.6	62.6	0.0	No
Rec 7	9	56.8	56.9	0.1	No
Rec 8	3	54.6	54.6	0.0	No
Rec 9	9	56.8	56.7	-0.1	No
Rec 10	3	56.0	55.9	-0.1	No
Rec 11	3	53.9	53.9	0.0	No
Rec 12	5	54.9	54.8	-0.1	No
Rec 13	5	53.3	53.2	-0.1	No
Rec 14	5	55.6	55.6	0.0	No
Rec 15	6	54.3	54.4	0.1	No
Rec 16	4	55.1	55.2	0.1	No
Rec 17	4	57.4	57.4	0.0	No
Rec 18	30 ^[1]	54.4	54.5	0.1	No
Rec 19	4	50.8	51.4	0.6	No
Rec 20	30 ^[1]	64.3 ^[2]	63.9	-0.4	No
Rec 21	6	56.5	56.4	-0.1	No
Rec 22	7	55.8	55.7	-0.1	No

Notes: [1] Common outdoor amenity area representing with approximately 30 seating spots.

[2] Most exposed side of the building is shown because the outdoor common amenity area is not currently visible.

2.8 Discussion of Impacts and Investigation of Noise Mitigation

The results show that changes in sound levels resulting from the proposed project are expected to be no higher than approximately 1 dBA. The majority of NSA’s will experience either very minor increases or decreases in noise levels as a result of very minor changes in roadway alignments. For the 2039 traffic year the same road traffic volumes were used both the “no-build” and “build” alternatives. Sound levels within the study area will gradually increase as a result of gradually increasing road traffic volumes.

No investigation of additional noise mitigation was undertaken because there were no changes in sound levels greater than the criteria set out in the Protocol.

3.0 CONSTRUCTION NOISE IMPACTS

Construction noise impacts are temporary in nature, and largely unavoidable. Although for some periods and types of work, construction noise will be noticeable, with adequate controls, impacts can be minimized. This section of the report provides an examination of the City of London noise bylaw and recommends a Code of Practice to minimize impacts.

3.1 Construction Noise Guidelines

3.1.1 Local Noise Control Bylaw

The proposed project lies within the local jurisdiction of the City of London. A bylaw restricting noise from construction activity exists within the City. The City of London has a permanent exemption under this by-law as outlined in Part 6 – Exemptions of the by-law as summarized below in **Table 5**. A consolidated copy of the bylaw can be found in **Appendix E**.

Table 5: City of London Noise Control Bylaw

Jurisdiction	Bylaw Number	Bylaw Provision
City of London	By-law PW 12	<p><u>PART 6 – EXEMPTIONS</u></p> <p>6.1 Despite any provision of this By-law, this By-law shall not apply to the following sounds arising from:</p> <p>City Construction Projects (g) the operation of equipment in conjunction with City Construction projects, City general maintenance projects, and City emergency maintenance projects;</p>

3.1.2 MECP Model Municipal Noise Control Bylaw

The MECP stipulates limits on noise emissions from individual items of equipment, rather than for overall construction noise. In the presence of persistent noise complaints, sound emission standards for the various types of construction equipment used on the project should be checked to ensure that they meet the specified limits contained in MOE Publication NPC-115 – “Construction Equipment”, as shown in **Table 6** (MECP 1977):

Table 6: NPC-115 Maximum Noise Emission Levels for Typical Construction Equipment

Type of Unit	Maximum Sound Level ^[1] (dBA)	Distance (m)	Power Rating (kW)
Excavation Equipment ^[2]	83	15	< 75
	85	15	> 75
Pneumatic Equipment ^[3]	85	7	-
Portable Compressors	76	7	-

Notes: [1] Maximum permissible sound levels presented here are for equipment manufactured after Jan. 1, 1981.

[2] Excavation equipment includes bulldozers, backhoes, front end loaders, graders, excavators, steam rollers and other equipment capable of being used for similar applications.

[3] Pneumatic equipment includes pavement breakers.

3.2 Anticipated Construction Activities

The following construction activities are anticipated as part of this project:

- Removing existing surface pavements
- Earth grading
- Construction and rehabilitation of the base course
- Paving (and repaving) of the roadway surfaces
- Culvert construction or extensions
- Construction of new roadway including removal of overburden

3.3 Construction Code of Practice Requirements (Mitigation)

To minimize the potential for construction noise impacts, it is recommended that provisions be written into the contract documentation for the contractor, as outlined below:

- Where possible construction should be carried out during the daytime. If construction activities are required outside of these hours, the Contractor should try and minimize the amount of noise being generated.
- There should be explicit indication that Contractors are expected to comply with all applicable requirements of the contract.
- All equipment should be properly maintained to limit noise emissions. As such, all construction equipment should be operated with effective muffling devices that are in good working order.
- The Contract documents should contain a provision that any initial noise complaint will trigger verification that the general noise control measures agreed to be in effect.
- In the presence of persistent noise complaints, all construction equipment should be verified to comply with MECP NPC-115 guidelines, as outlined in Section 3.1.2.
- In the presence of persistent complaints and subject to the results of a field

investigation, alternative noise control measures may be required, where reasonably available. In selecting appropriate noise control and mitigation measures, consideration should be given to the technical, administrative and economic feasibility of the various alternatives.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The potential environmental noise impacts of the proposed undertaking have been assessed. Both operational and construction noise impacts have been considered resulting in the following conclusions and recommendations:

- The results show that changes in sound levels resulting from the proposed project are expected to be no higher than approximately 0.6 dBA.
- No investigation of noise mitigation was undertaken because there were no changes in sound levels greater than the criteria set out in the Joint Protocol.
- The City of London may wish to undertake a structural and acoustical evaluation of the effectiveness of the wooden noise barriers within the study limits.
- Construction noise impacts are temporary in nature but will be noticeable at times at residential NSAs. Methods to minimize construction noise impacts should be included in the Construction Code of Practice, as outlined in **Section 3.3**

5.0 REFERENCES

Ontario Ministry of the Environment, Conservation and Parks (MECP), 1977b, *Model Municipal Noise Control Bylaw*, which includes Publication NPC-115 – Construction Equipment

Barry, T.M. and Reagan, J.A., "FHWA Highway Noise Prediction Model", U.S. Federal Highway Administration, Report FHWA RD-77 108, December 1978

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Assessments

Ontario Ministry of Transportation (MTO), 1992a, Quality and Standards Directive QST-A1, Noise Policy and Acoustic Standards for Provincial Highways

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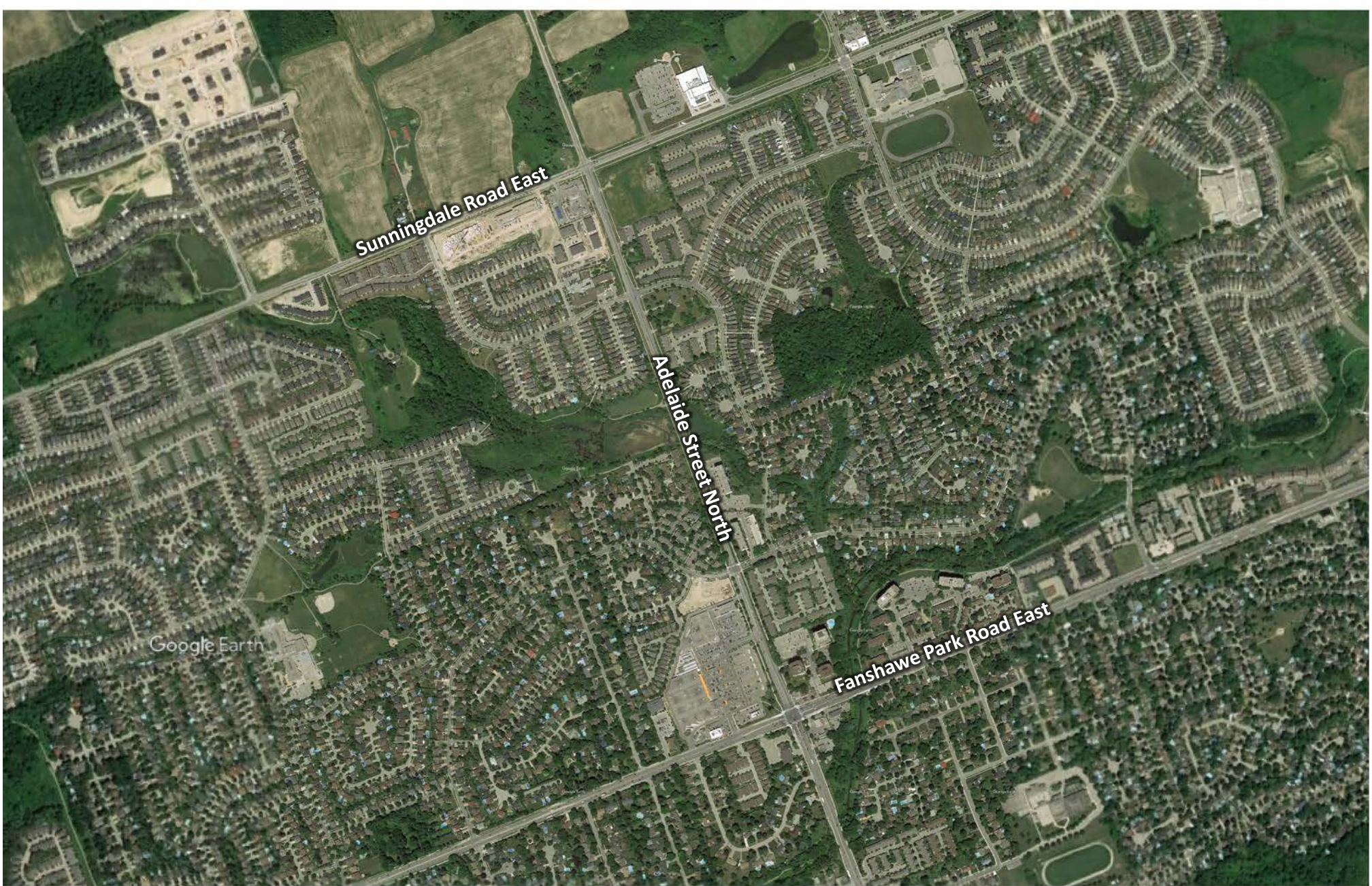


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Figure No. 1
Overview Map of Study Area

Adelaide Street North Environmental Noise Assessment
London, Ontario



True
North

Scale: 1:12,000
Date: 19/07/03
File No.: 18-0045
Drawn By: CTB

novus
ENVIRONMENTAL



Source: City of London

Figure No. 2

Specific Map of Study Area Identified by City of London

Adelaide Street North Environmental Noise Assessment
London, Ontario



True
North

Scale:	NTS
Date:	19/07/03
File No.:	18-0045
Drawn By:	CB





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Figure No. 3

Location of Representative Noise Sensitive Receptors 1 to 6

Adelaide Street North Environmental Noise Assessment
London, Ontario



True North

Scale: 1:2,000

Date: 19/07/03

File No.: 18-0045

Drawn By: CTB





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Figure No. 4

Location of Representative Noise Sensitive Receptors 7 to 11

Adelaide Street North Environmental Noise Assessment
London, Ontario



True North

Scale: 1:2,000
Date: 19/07/03
File No.: 18-0045
Drawn By: CTB



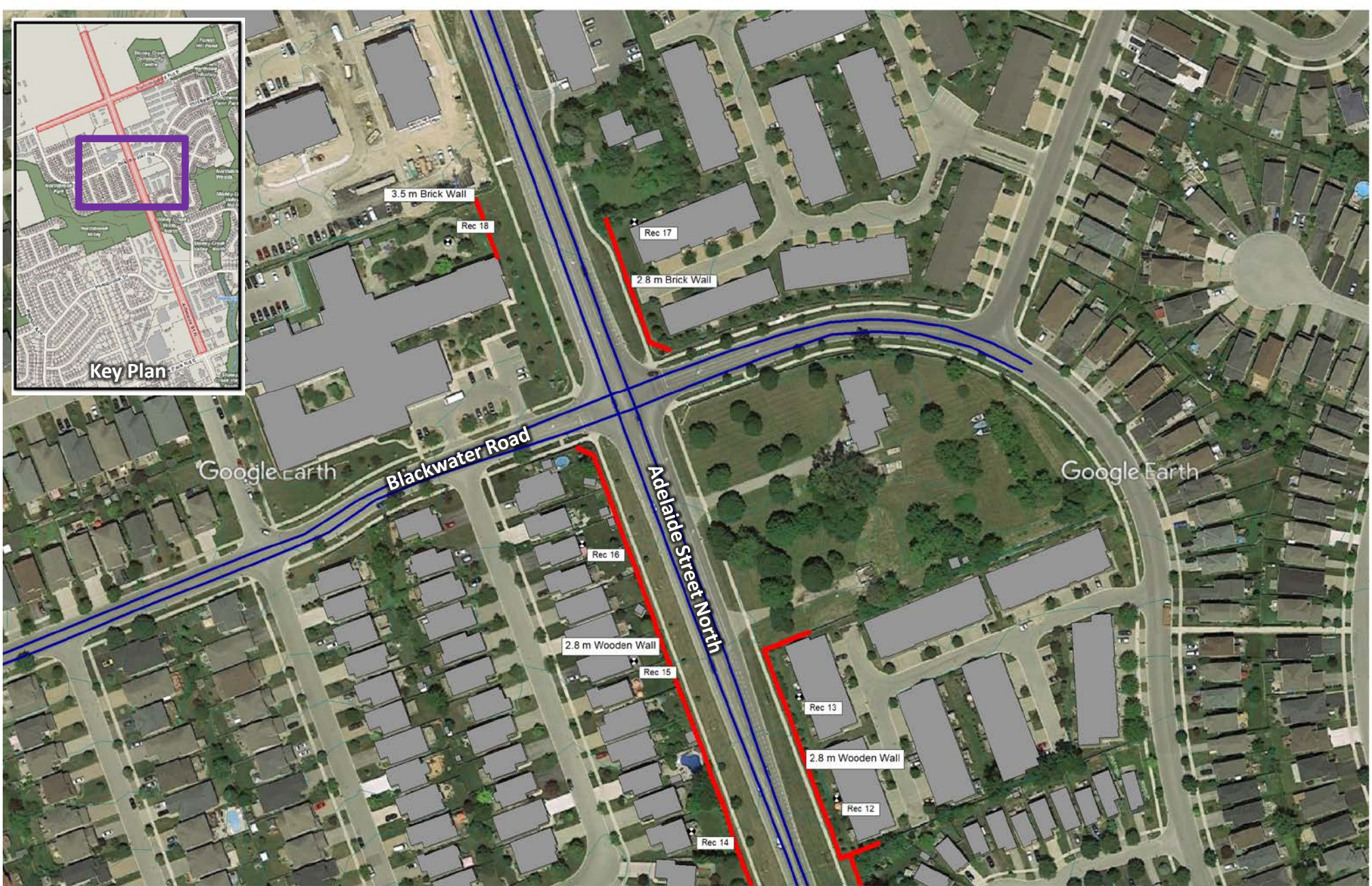


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Figure No. 5

Location of Representative Noise Sensitive Receptors 12 to 18

Adelaide Street North Environmental Noise Assessment
London, Ontario



True North

Scale: 1:2,000

Date: 19/07/03

File No.: 18-0045

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Figure No. 6

Location of Representative Noise Sensitive Receptors 19 and 20

Adelaide Street North Environmental Noise Assessment
 London, Ontario



True
 North

Scale: 1:2,000

Date: 19/07/03

File No.: 18-0045

Drawn By: CTB



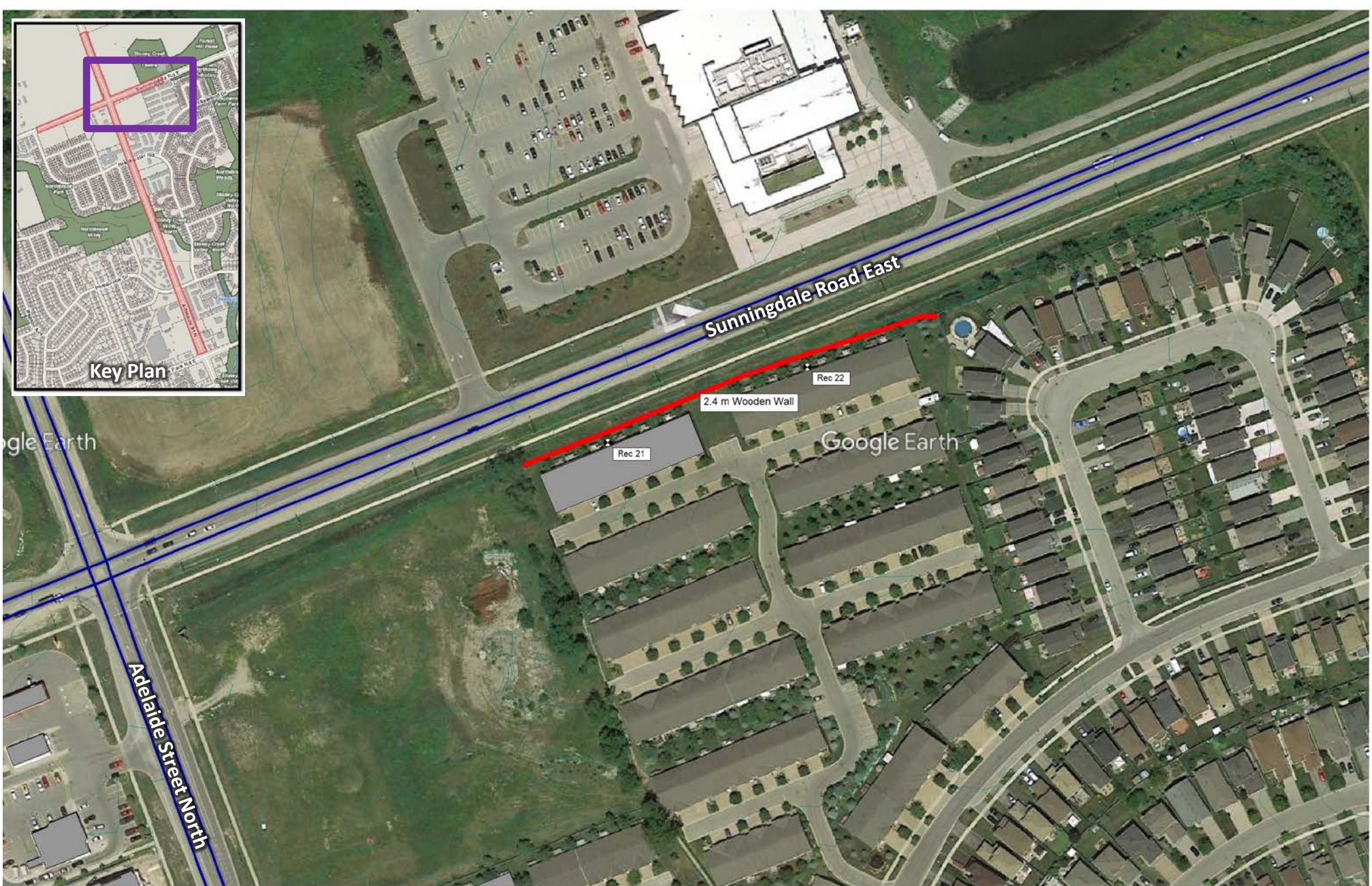


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Figure No. 7

Location of Representative Noise Sensitive Receptors 21 and 22

Adelaide Street North Environmental Noise Assessment
 London, Ontario



True North

Scale: 1:2,000

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Appendix A

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Glossary of Commonly Used Noise Terminology

Airborne Sound*: Sound that reaches the point of interest by propagation through air.

Ambient or Background Noise: The ambient noise from all sources other than the sound of interest (i.e. sound other than that being measured). Under most MOE guidelines, aircraft overflights and train noise, due to their transient nature, are normally excluded from measurements of background noise.

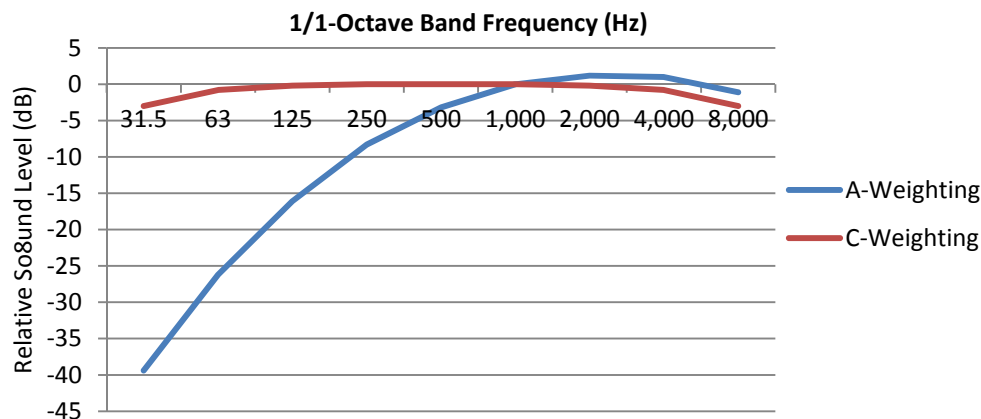
Articulation Index (AI)*: A numerically calculated measure of the intelligibility of transmitted or processed speech. It takes into account the limitations of the transmission path and the background noise. The articulation index can range in magnitude between 0 and 1.0. If the AI is less than 0.1, speech intelligibility is generally low. If it is above 0.6, speech intelligibility is generally high.

Attenuation*: The reduction of sound intensity by various means (e.g., air, humidity, porous materials, etc.).

dB -Decibel: The logarithmic units associated with sound pressure level, sound power level, or acceleration level. See sound pressure level, for example.

dBA -Decibel, A-Weighted: The logarithmic units associated with a sound pressure level, where the sound pressure signal has been filtered using a frequency weighting that mimics the response of the human ear to quiet sound levels. The resultant sound pressure level is therefore representative of the subjective response of the human ear. A-weighted sound pressure levels are denoted by the suffix 'A' (ie. dBA), and the term pressure is normally omitted from the description (i.e., sound level or noise level).

dBc -Decibel, C-Weighted: The logarithmic units associated with a sound pressure level, where the sound pressure signal has been filtered using a frequency weighting that mimics the response of the human ear to loud sound levels. C-weighted sound pressure levels are denoted by the suffix 'C' (ie dBc). C-weighted levels are often used in low-frequency noise analysis, as the filtering effect is nearly flat at lower frequencies.



dB or dBLin -Decibel, Linear: The logarithmic units associated with a sound pressure level, where the sound pressure signal is unfiltered, and represents the full spectrum of incoming noise.

Calibrator (Acoustical)*: A device which produces a known sound pressure on the microphone of a sound level measurement system, and is used to adjust the system to standard specifications.

Definitions with a "*" marker originally from "Noise Control Terms Made Somewhat Easier", by David Kelso (Minnesota Pollution Control Agency), and Al Perez (Northern Sound), Minneapolis, Minnesota May, 1983, as modified on the Noise Pollution Clearinghouse website www.nonoise.org.

Directivity Factor (Q) (also, **Directional** or **Directionality Factor**): A factor mathematically related to Directivity Index, used in calculating propagated sound levels to account for the effect of reflecting surfaces near to the source. For example, for a source in free space where the sound is radiating spherically, $Q = 1$. For a source located on or very near to a surface (such as the ground, a wall, rooftop, etc.), where the sound is radiating hemispherically, $Q = 2$. This accounts for the additional sound energy reflecting off the surface, and translates into a +3 dB add.

Directivity Index*: In a given direction from a sound source, the difference in decibels between (a) the sound pressure level produced by the source in that direction, and (b) the space-average sound pressure level of that source, measured at the same distance.

Energy Equivalent Sound Level (L_{eq}): An energy-average sound level taken over a specified period of time. It represents the average sound pressure encountered for the period. The time period is often added as a suffix to the label (i.e., $L_{eq}(24)$ for the 24-hour equivalent sound level). L_{eq} is usually A-weighted. An L_{eq} value expressed in dBA is a good, single value descriptor of the annoyance of noise.

Exceedance Noise Level (L_N): The noise level exceeded N% of the time. It is a statistical measure of the noise level. For highly varying sounds, the L_{90} represents the background noise level, L_{50} represents the median or typical noise level, and L_{10} represents the short term peak noise levels, such as those due to occasional traffic or a barking dog.

Far Field*: Describes a region in free space where the sound pressure level from a source obeys the inverse-square law (the sound pressure level decreases 6 dB with each doubling of distance from the source). Also, in this region the sound particle velocity is in phase with the sound pressure. Closer to the source where these two conditions do not hold constitutes the “near field” region.

Free Sound Field (Free Field)*: A sound field in which the effects of obstacles or boundaries on sound propagated in that field are negligible.

Frequency*: The number of times per second that the sine wave of sound or of a vibrating object repeats itself. Now expressed in hertz (Hz), formerly in cycles per second (cps).

Hertz (Hz)*: Unit of measurement of frequency, numerically equal to cycles per second.

Human Perception of Sound: The human perception of noise impact is an important consideration in qualifying the noise effects caused by projects. The following table presents a general guideline.

Subjective Human Perception of Changes in Sound Levels

Change in Broadband Sound Level (dB)	Human Perception of Change
<3	Imperceptible change
3	Just-perceptible change
4 to 5	Clearly noticeable change
6 to 9	Substantial change
>10 and more	Very substantial change (half or twice as loud)
>20 and more	Very substantial change (much quieter or louder)

Notes:

Adapted from Bies and Hansen, p53, and MOE Noise Guidelines for Landfill Sites, 1998. Applies to changes in broadband noise sources only (i.e., increases or decreases in the same noise or same type of noise only). Changes in frequency content or the addition of tonal or temporal changes would affect the perception of the change.

Impact Insulation Class (IC)*: A single-figure rating that compares the impact sound insulating capabilities of floor-ceiling assemblies to a reference contour.

Impact Sound*: The sound produced by the collision of two solid objects, e.g., footsteps, dropped objects, etc., on an interior surface (wall, floor, or ceiling) of a building. Typical industrial sources include punch presses, forging hammers, etc.

Impulsive Noise*: a) Single or multiple sound pressure peak(s) (with either a rise time less than 200 milliseconds or total duration less than 200 milliseconds) spaced at least by 500 millisecond pauses, b) A sharp sound pressure peak occurring in a short interval of time.

Infrasonic*: Sounds of a frequency lower than 20 hertz.

Insertion Loss (IL): The arithmetic difference between the sound level from a source before and after the installation of a noise mitigation measure, at the same location. Insertion loss is typically presented as a positive number, i.e., the post-mitigation sound level is lower than the pre-mitigation level. Insertion loss is expressed in dB and is usually specified per 1/1 octave band, per 1/3 octave band, or overall.

Intensity*: The sound energy flow through a unit area in a unit time.

Low Frequency Noise (LFN): Noise in the low frequency range, from infrasonic sounds (<20 Hz) up to 100 Hz.

Masking*: a) The process by which the threshold of audibility for a sound is raised by the presence of another (masking) sound, or b) The amount by which the threshold of audibility of a sound is raised by the presence of another (masking) sound.

Near Field*: The sound field very near to a source, where sound pressure does not obey the inverse-square law and the particle velocity is not in phase with the sound pressure.

Noise: Unwanted sound.

Noise Criteria (NC) Curves: A single number rating for noise in 1/1-octave frequency bands which is sensitive to the relative loudness and speech interference properties of a given sound spectrum. The method consists of a family of criteria curves extending from 63 Hz to 8000 Hz, and a tangency rating procedure. Originally proposed by Bernanek in 1957. While other more modern criteria curve rating schemes exist (NCB, RC, RC Mark II, RNC, etc.), NC curves are still widely used in determining acceptability of noise levels within spaces. Level of NC 25 to NC 35 are usually considered acceptable for residences, private offices, and schools.

Noise Isolation Class (NIC)*: A single number rating derived in a prescribed manner from the measured values of noise reduction between two areas or rooms. It provides an evaluation of the sound isolation between two enclosed spaces that are acoustically connected by one or more paths.

Noise Reduction (NR)*: The numerical difference, in decibels, of the average sound pressure levels in two areas or rooms. A measurement of "noise reduction" combines the effect of the sound transmission loss performance of structures separating the two areas or rooms, plus the effect of acoustic absorption present in the receiving room.

Noise Reduction Coefficient (NRC)*: A measure of the acoustical absorption performance of a material, calculated by averaging its sound absorption coefficients at 250, 500, 1000 and 2000 Hz, expressed to the nearest multiple of 0.05.

Noise Level: Same as Sound Level, except applied to unwanted sounds.

Noise Exposure Forecast (NEF): A calculated measure of aircraft noise based on the type of aircraft in use, the take-off and landing patterns of the aircraft, and times of operation. It represents the noise exposure over a typical 24 hour period. A penalty is applied to nighttime operation.

Harmonizing the Built and Natural Environments

Peak Sound Pressure Level: Same as Sound Pressure Level except that peak (not peak-to-peak) sound pressure values are used in place of RMS pressures.

Quasi-Steady Impulsive Noise: Noise composed of a series of short, discrete events, characterized by rapid rise times, but with less than 0.5 seconds elapsing between events.

RMS Sound Pressure: The square-root of the mean-squared pressure of a sound (usually the result of an RMS detector on a microphone signal).

Reverberant Field*: The region in a room where the reflected sound dominates, as opposed to the region close to the noise source where the direct sound dominates.

Reverberation*: The persistence of sound in an enclosed space, as a result of multiple reflections, after the sound source has stopped.

Reverberation Time (RT)*: The reverberation time of a room is the time taken for the sound pressure level to decrease 60 dB from its steady-state value when the source of sound energy is suddenly interrupted. It is a measure of the persistence of an impulsive sound in a room as well as of the amount of acoustical absorption present inside the room. Rooms with long reverberation times are called live rooms.

Sabin*: A measure of the sound absorption of a surface; it is the equivalent of one square metre of a perfectly absorptive surface (or one square foot in imperial units).

Sound: a dynamic (fluctuating) pressure.

Sound Exposure Level (SEL): An L_{eq} referenced to a one second duration. Also known as the Single Event Level. It is a measure of the cumulative noise exposure for a single event. It provides a measure of the accumulation of sound energy over the duration of the event.

Sound Level (SL): The A-weighted Sound Pressure Level expressed in dBA.

Sound Level Meter*: An instrument comprised of a microphone, amplifier, output meter, and frequency-weighting networks which is used for the measurement of noise and sound levels.

Sound Pressure Level (SPL): The logarithmic ratio of the RMS sound pressure to the sound pressure at the threshold of hearing. The sound pressure level is defined by equation (1) where P is the RMS pressure due to a sound and P_0 is the reference pressure. P_0 is usually taken as 2.0×10^{-6} Pascals.

$$(1) \text{ SPL (dB)} = 20 \log(P_{\text{RMS}}/P_0)$$

Sound Power Level (PWL): The logarithmic ratio of the instantaneous sound power (energy) of a noise source to that of an international standard reference power. The sound power level is defined by equation (2) where W is the sound power of the source in watts, and W_0 is the reference power of 10^{-12} watts.

$$(2) \text{ PWL (dB)} = 10 \log(W/W_0)$$

Interrelationships between sound pressure level (SPL) and sound power level (PWL) depend on the location and type of source.

Sound Transmission Class (STC)*: The preferred single figure rating system designed to give an estimate of the sound insulation properties of a structure or a rank ordering of a series of structures.

Sound Transmission Loss (STL)*: A measure of sound insulation provided by a structural configuration. Expressed in decibels, it is 10 times the logarithm to the base 10 of the reciprocal of the sound transmission coefficient of the configuration.

Spectrum*: The description of a sound wave's resolution into its components of frequency and amplitude.

Speech Interference Level (SIL)*: A calculated quantity providing a guide to the interference of a noise with the reception of speech. The speech-interference level is the arithmetic average of the octave band levels of the interfering noise in the most important part of the speech frequency range. The levels in octave bands centered at 500, 1000, and 2000 Hz are commonly averaged to determine the speech-interference level.

Speed (Velocity) of Sound in Air*: 344 m/s (1128 ft/s) at 70°F (21°C) in air at sea level.

Threshold of Audibility (Threshold of Detectability)*: The minimum sound pressure level at which a person can hear a specified frequency of sound over a specified number of trials.

Transmission Loss: A measure of the reduction in sound energy resulting from incident sound waves striking a wall, partition or enclosure, and radiating through to the other side. Mathematically, the transmission coefficient t is the ratio of transmitted acoustic power to the incident acoustic power, and in decibels, the Transmission Loss (TL) of the wall is:

$$(3) TL = 10 \log(1 / t)$$

The TL of a wall varies by frequency. The associated noise reduction (NR) due to the TL of the wall is a function of the TL and the acoustical parameters of the receiving space. For noise radiating from an enclosure into the outdoors, $NR = (TL + 6)$.

TRANSPORTATION SOUND BASICS

Sound Levels

Sound is, in its simplest form, a dynamic, fluctuating pressure, in a fluid medium. That medium can be air, other gases, or liquids such as water. These fluctuations are transmitted by pressure waves through the medium from the source to the receiver. For the majority of transportation engineering purposes, the primary interest is with sound waves in air, with human beings as the receptor. Noise is defined as unwanted sound. The standard practice within the acoustical industry is to use these two terms interchangeably.

Decibels

A decibel (dB) is a logarithmic ratio of a value to a reference level. The general mathematical format is:

$$\text{Level in dB} = 10 \log (\text{Value} / \text{Reference})$$

Any value can be expressed in decibels. Decibels are very, very useful in performing comparisons where there are huge ranges in levels. For example, an acoustical engineer can expect to deal with acoustical energy values ranging from 0.00001 W to 100 W (sound power), and pressures ranging from 0.002 Pa to 200 Pa (sound pressure).¹ For completeness, decibels should always be stated with their reference level (e.g., 20 dB re: 20 μ Pa). However, in practice the reference level is often left out.

Sound Pressure Level

Sound pressure level is what humans experience as sound. Sound waves create small fluctuations around the normal atmospheric pressure. These pressure fluctuations come into contact with eardrums and create the sensation of sound. Sound pressure is measured in decibels, according to the following equation:

$$\text{Sound Pressure Level, dB} = 10 \log (p^2/p_0^2)$$

Where: p = root mean square (r.m.s.) sound pressure, in Pa
 p_0 = reference sound pressure, 20 μ Pa

The reference pressure represents the faintest sound that a “typical” human being can hear. The typical abbreviation for sound pressure level is SPL, although L_p is also often used in equations. “Sound level” or “noise level” are also sometimes used.

Octave Bands

Sounds are composed of varying frequencies or pitches. Human sensitivity to noise varies by frequency, with a greater sensitivity to higher frequency sounds. The propagation of sound also varies by frequency. The unit of frequency is Hertz (Hz), which refers the number of cycles per second (number of wave peaks per second of the propagating sound wave). The typical human hearing response runs from 20 Hz to 20,000 Hz. Frequencies below 20 Hz are generally inaudible, although response is variable, and some individuals may be able to hear or perceive them.

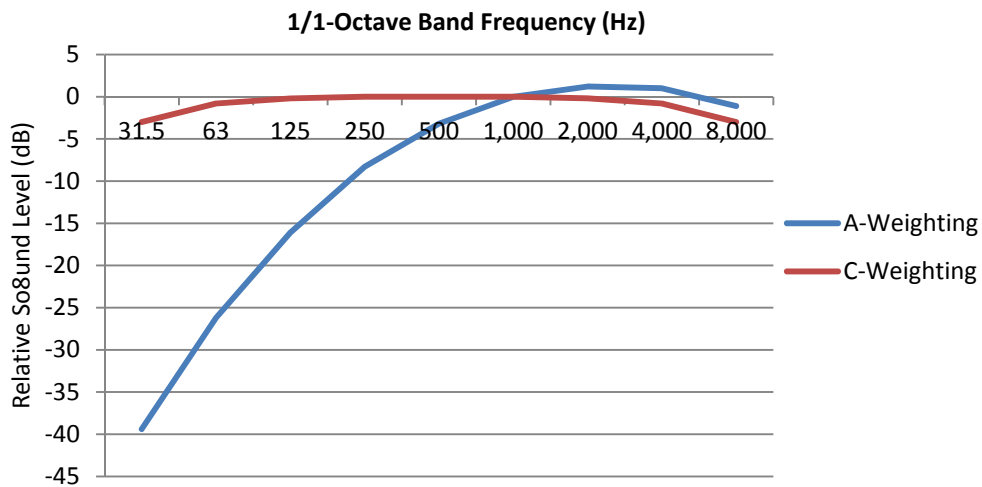
¹ Equivalent to Sound Power Levels ranging from 70 to 140 dB and Sound Pressure Levels ranging from 20 dB to 140 dB

Sound is typically analysed in octave bands or 1/3-octave bands. An octave band is defined as a band or range of sound frequencies where the frequency range doubles for succeeding octave (alternately, the highest frequency in the range is twice the value of the lowest frequency).

A-Weighting

When the overall sound pressure level is expressed as a single value (i.e., not expressed in frequency band levels) the variation in human frequency response must be accounted for. People do not hear low frequency noise as well as noise in mid or high frequencies. To account for this, frequency-weighting networks have been developed to better account for human hearing response. The most frequently used networks are the A-Weighting and C-Weighting.

The A-Weighting network was developed to correspond to how humans hear low to medium levels of noise. The A-Weighting is the most frequently used scheme, and the majority of noise guidelines are expressed in A-Weighted decibel values, denoted as “dBA” levels. C-Weighted “dBC” values are sometimes used in assessing low-frequency noise impacts, which are generally not of concern in transportation noise impact assessment. The A-Weighting and C-Weighting values are shown in the following figure.



A-Weighting and C-Weighting Networks

Ranges of Sound Levels

People experience a wide range of sound levels in their daily activities. The table below presents a graphical comparison of “typical” noise levels which might be encountered, and the general human perception of the level. Sound levels from 40 to 65 dBA are in the faint to moderate range. The vast majority of the outdoor noise environment, even within the busiest city cores, will lie within this area. Sound levels from 65 to 90 are perceived as loud. This area includes very noisy commercial and industrial spaces. Sound levels greater than 90 dB are very loud to deafening, and may result in hearing damage.

Ranges of Sound Levels

Sound Levels		Sources of Noise
Human Perception	SPL in dBA	
Deafening	125	Sonic booms
	120	Threshold of Feeling / Pain
	115	Maximum level, hard rock band concert
	110	Accelerating Motorcycle at a few feet away
Very Loud	105	Loud auto horn at 3 m (10 ft) away
	100	Dance club / maximum human vocal output at 1 m (3 ft) distance
	95	Jack hammer at 15 m (50 ft) distance
	90	Indoors in a noisy factory
Loud	85	Heavy truck pass-by at 15 m (50 ft) distance
	80	School cafeteria / noisy bar; Vacuum cleaner at 1.5 m (5 ft)
	75	Near edge of major highway
	70	Inside automobile at 60 km/h
	65	Normal human speech (unraised voice) at 1 m (3 ft) distance
Moderate	60	Typical background noise levels in a large department store
	55	General objective for outdoor sound levels; typical urban sound level (24h)
	50	Typical suburban / semi-rural sound level (24h)
	45	Typical noise levels in an office due to HVAC; typical rural levels (24h)
Faint	40	Typical background noise levels in a library
	35	
	30	Broadcast Studio
	25	Average whisper
Very Faint	20	Deep woods on a very calm day
	15	
	10	
	5	Human breathing
	0	Quietest sound that can be heard

Transportation noise events, which vary with time, can also be considered in terms of their maximum noise level (L_{max}) during a vehicle pass-by, as shown in the following table:

Typical Pass-By Noise Level at 15 m from Noise Source

Event	Range of Noise Levels (dBA) at 15 m
Semi-Trailer Trucks	75 - 85
Aircraft	69 - 85 [1]
Conventional Light Rapid Transit (Streetcars)	72 - 80 [2]
Large Trucks	71 - 78
Street Motorcycle	76
Diesel or Natural Gas Bus	70 - 78
Trolley Bus	69 - 73
Small Motorcycle	67
General Busy Auto Traffic	66 - 70
Individual Automobiles	63 - 69

Notes: Source: BKL Consultants Ltd.

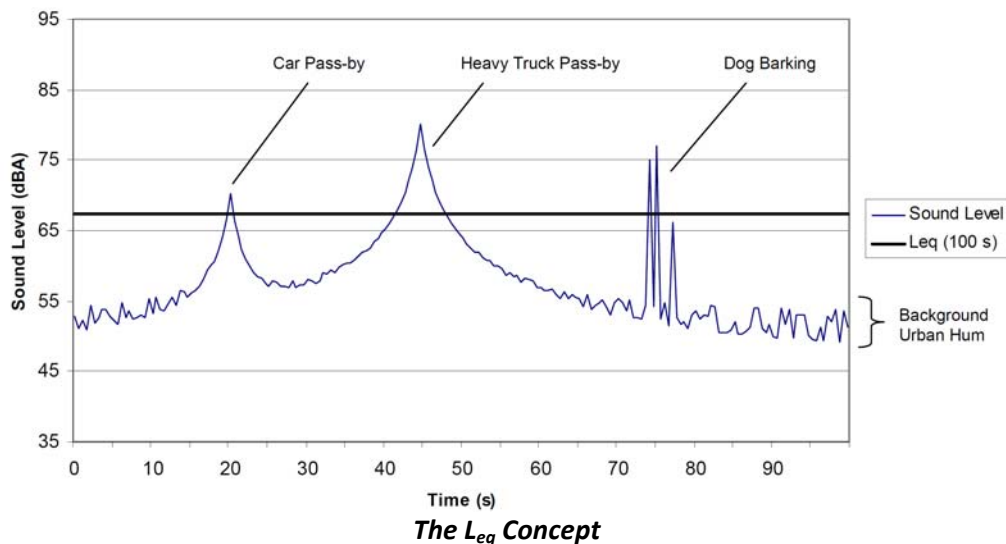
[1] Aircraft flyover not at 15 m distance

[2] Based on data provided for the Calgary, Edmonton and Portland LRT systems.

Noise Descriptors – L_{eq} Values

At this time, the best available research indicates that long-term human responses to noise are best evaluated using energy equivalent sound exposure levels (L_{eq} values), in A-Weighted decibels (L_{eq} values in dBA)^{2,3} including adjustments to account for particularly annoying characteristics of the sounds being analyzed.

Sound levels in the ambient environment vary each instant. In a downtown urban environment, the background noise is formed by an “urban hum”, composed of noise from distant road traffic and from commercial sources. As traffic passes near a noise receptor, the instantaneous sound level may increase as a vehicle approaches, and then decrease as it passes and travels farther away. The energy equivalent sound exposure level L_{eq} is the average sound level over the same period of time with same acoustical energy as the actual environment (i.e., it is the average of the sound energy measured over a time period T). As a time-average, all L_{eq} values must have a time period associated with them. This is typically placed in brackets beside the L_{eq} tag. For example, a thirty-minute L_{eq} measurement would be reported as an L_{eq} (30 min) value. The L_{eq} concept is illustrated in Figure 3, showing noise levels beside a small roadway, over a 100 second time period, with two vehicle pass-bys:



In this example, the background “urban hum” is between 47 and 53 dBA. A car passes by at 20 seconds. As it approaches, the noise level increases to a maximum, and then decreases as it speeds away. At 45 seconds, a heavy truck passes by. Near 75 seconds, a dog barks three times. The maximum sound level (L_{max}) over the period is 80 dBA and the minimum is 47 dBA. For almost 50 % of the time, the sound level is lower than 55 dBA.

The L_{eq} (100s) for the example is 67 dBA, which is much higher than the statistical mean sound level of 55 dBA. This illustrates that the L_{eq} value is very sensitive to loud noise events, which contain much more sound energy (as sound is ranked on a logarithmic scale) than the normal background. It is also sensitive to the number of events during the time period, and the duration of those events. If only the truck had passed by during the measurement (no car and no dog barks), the L_{eq} (100s) would be 66 dBA. If only the car and dog barks had occurred, the L_{eq} (100s) would be 61 dBA. This shows that the truck pass-by is the dominant event in our example, due to its level and duration.

² Berglund and Lindvall, Community Noise, 1995.

³ ISO 1996:2003(E), Acoustics – Description, measurement and assessment of environmental noise – Part 1: Basic quantities and assessment procedures.

The ability of the L_{eq} metric to account for the three factors of level, duration and frequency of events makes it a robust predictor of human response to noise. It is for this reason that the vast majority of noise standards are based on L_{eq} values.

Typical Durations for L_{eq} Analyses

For transportation noise impact analyses, the following durations are typically used:

L_{eq} (24h)	–	The sound exposure level over then entire 24-hour day
L_{eq} Day	–	Either: Leq (15h), from 7am to 10 pm; or Leq (16h), from 7am to 11 am
L_{eq} Night	–	Either: Leq (9h), from 10 pm to 7 am; or Leq (8h), from 11 pm to 7 am
L_{dn}	–	A special Leq (24h) value with a 10 dB night-time penalty applied to overnight sound levels (10pm to 7am)
L_{eq} (1-h)	–	The sound exposure over a 1-hour time period

L_{eq} (24h) values are appropriate for examining impacts of transportation noise sources with small changes in sound exposure levels over the 24-hour day. For example, freeway noise levels are generally consistent over the 24-hour day. Therefore, for freeways, there is little difference between L_{eq} (24h) values and the corresponding L_{eq} Day and L_{eq} Night values.

L_{eq} Day values, covering off the AM-peak and PM-peak travel periods, are generally appropriate for examining the impacts of non-freeway highways and municipal arterial roadways. The vast majority of noise associated with these sources is concentrated in the daytime hours, where typically, 85% to 90% of the daily road traffic will occur.⁴ Thus, if reasonable sound levels occur during the daytime (and appropriate guideline limits are met), they will also occur (and be met) at night.

To account for increased annoyance with noise overnight in a single value, the U.S. Environmental Protection Agency (U.S. EPA) developed the L_{dn} metric (also known as DNL). It is a special form of the L_{eq} (24h) with a +10 dB night-time penalty. L_{dn} values and a related metric, the day-evening-night level (Lden) are also used in some European guidelines. L_{dn} values are not used in Canadian Provincial jurisdictions in evaluating transportation noise. Instead, guideline limits for separate Leq Day and Leq Night periods are generally used.

L_{eq} (1-h) values are the average sound levels over a one-hour time period. These tend to fluctuate more over the day, as traffic levels can fluctuate significantly hour to hour. L_{eq} (1-h) values are useful in assessing the impact of transportation sources which also vary hourly, and which may vary in a different manner than the background traffic. These values are often used to assess haul route noise impacts, for example.

⁴ Based on research conducted by Ontario Ministry of Transportation, and provided in the *MTO Environmental Office Manual Technical Areas – Noise*. Daytime refers to a 16 hour day from 7am to 11 pm.

Some transportation noise sources may have significant traffic levels occurring overnight. For example, freight rail traffic in heavily used corridors can be shifted to over-night periods, with daytime track use being reserved for freight switcher traffic and passenger traffic. In situations such as this, an assessment of both daytime and night-time noise impacts may be appropriate.

Decibel Addition

Decibels are logarithmic numbers, and therefore have special properties of addition. Decibel values must be added logarithmically. If two sources, each emitting the same amount of sound energy, are placed side-by-side, then the total increase in sound level will only be 3 dB. If the difference in sound energy emitted is greater than 10 dB, then effectively the sound level will be the same as for the loudest unit (i.e., the increase in noise will be less than a decibel).

Decibel Addition Chart

dB Difference Of	dB Value to Add to Highest Number
0	3.0
1	2.5
2	2.1
3	1.8
4	1.5
5	1.2
6	1.0
7	0.8
8	0.6
9	0.5
10	0.4

This affects transportation noise from projects, as noise emission is logarithmically related to traffic volume. Doubling the traffic volume (essentially the same as adding a source with the same sound emission) will only result in a 3 dB increase over the original levels. The decibel increase in noise due to the increase in traffic volume, assuming all other factors remain the same, can be estimated by:

$$\text{dB increase} = 10 \log (\text{new volume} / \text{original volume}).$$

Human Response to Changes in Sound Levels

The human ear does not interpret changes in sound level in a linear manner. The general subjective human perception of changes in sound level is shown in the following table.

Subjective Human Perception of Changes in Sound Levels^{5,6}

Change in Broadband Sound Level (dB)	Human Perception of Change
<3	Imperceptible change
3	Just-perceptible change
4 to 5	Clearly noticeable change
6 to 9	Substantial change
>10 and more	Very substantial change (half or twice as loud)
>20 and more	Very substantial change (much quieter or louder)

Notes:

Adapted from Bies and Hansen, p53, and MOE Noise Guidelines for Landfill Sites, 1998. Applies to changes in broadband noise sources only (i.e., increases or decreases in the same noise or same type of noise only). Changes in frequency content or the addition of tonal or temporal changes would affect the perception of the change.

The above table is directly applicable to changes in sound level where the noise sources are of the same general character. For example, existing road traffic noise levels can be directly compared to future road traffic noise levels, using the above relationships. In comparing road traffic noise to road plus rail traffic noise, the different frequency and temporal nature of the noise means that the rail noise may be more noticeable. Adjustments for the nature of the new sound can be applied to better account for temporal and frequency differences.

For transportation noise sources, research conducted by the U.S. Environmental Protection Agency indicates that a 5 dB change in sound levels is required to trigger a change in large-scale community response to noise. This correlates to a clearly noticeable increase in noise levels.

Decay of Noise with Distance

Noise levels decrease with increasing distance from a source of noise. The rate of decay is partially dependent on the nature of the ground between the source: whether it is hard (acoustically reflective) or soft (acoustically absorptive). Transportation noise sources in general act as *line sources* of sound. For line sources, the rate of decay is approximately:

- Hard ground: 3 dB for each doubling of distance from the source
- Soft ground: 5 dB for each doubling of distance from the source

⁵ Bies, D.A., and C.H Hansen 1988. Engineering Noise – Theory and Practice, 2nd Ed. E & E & FN Spon, London, p 53.

⁶ Ontario Ministry of the Environment 1998. Noise Guidelines for Landfill Sites. Queen’s Printer for Ontario.

Appendix B

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purposes



Turning Movements Report - AM Period

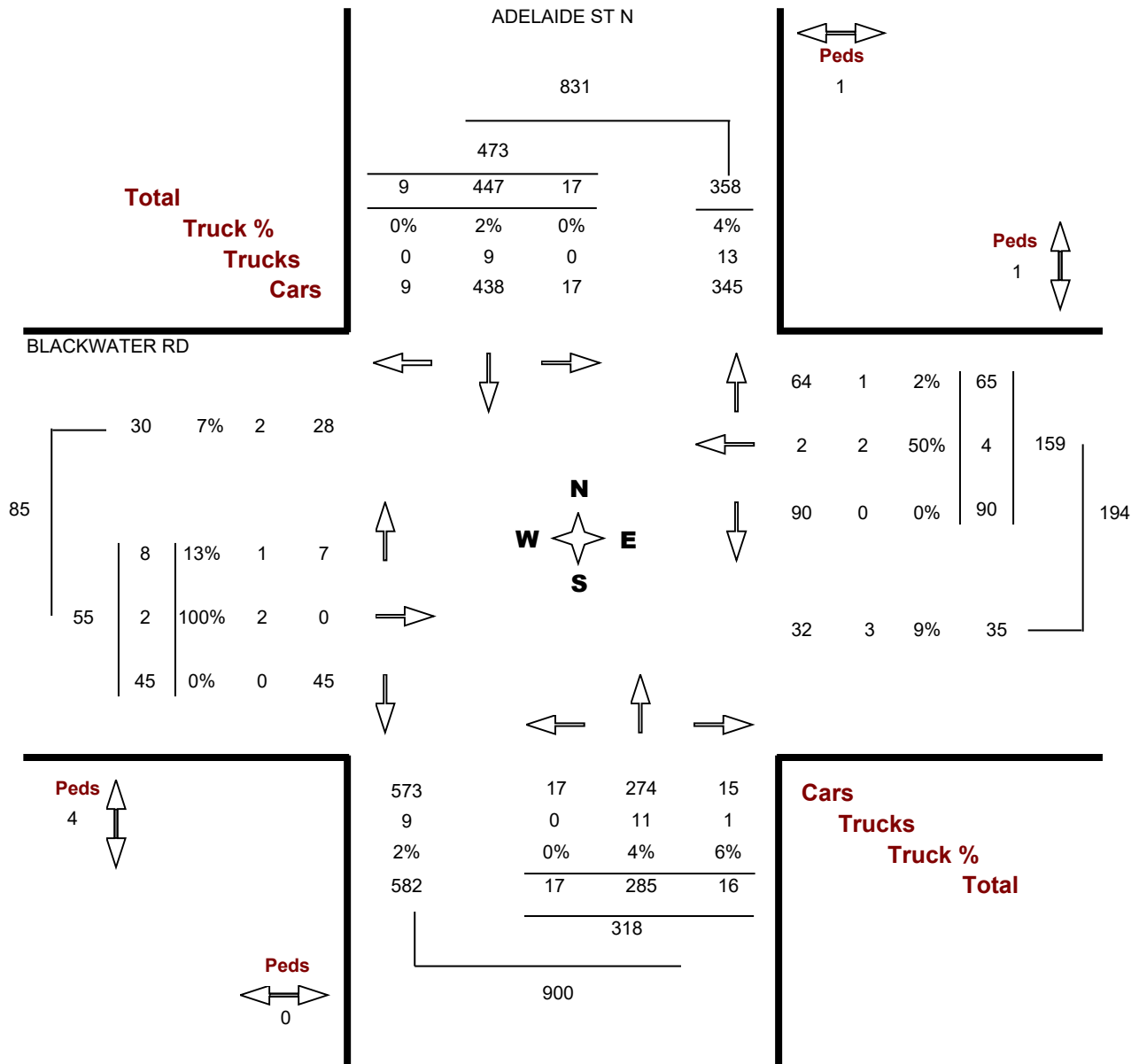
Location..... ADELAIDE ST N @ BLACKWATER RD

Municipality..... LONDON

GeoID..... INT102

Count Date..... Thursday, 01 October, 2015

Peak Hour..... 07:45 AM — 08:45 AM





Turning Movements Report - MD Period

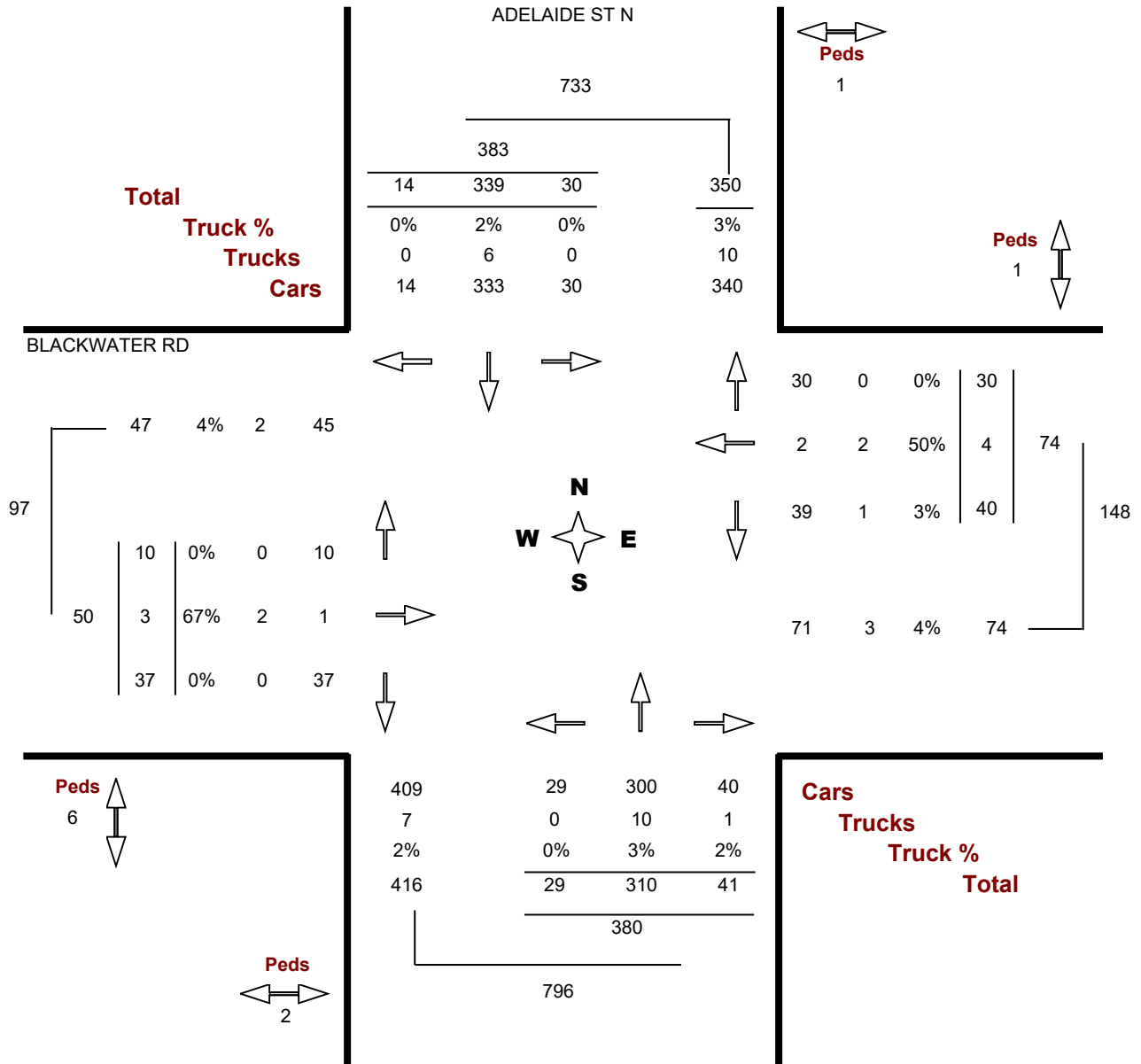
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Municipality..... LONDON

GeoID..... INT102

Count Date..... Thursday, 01 October, 2015

Peak Hour..... 11:30 AM — 12:30 PM





Turning Movements Report - PM Period

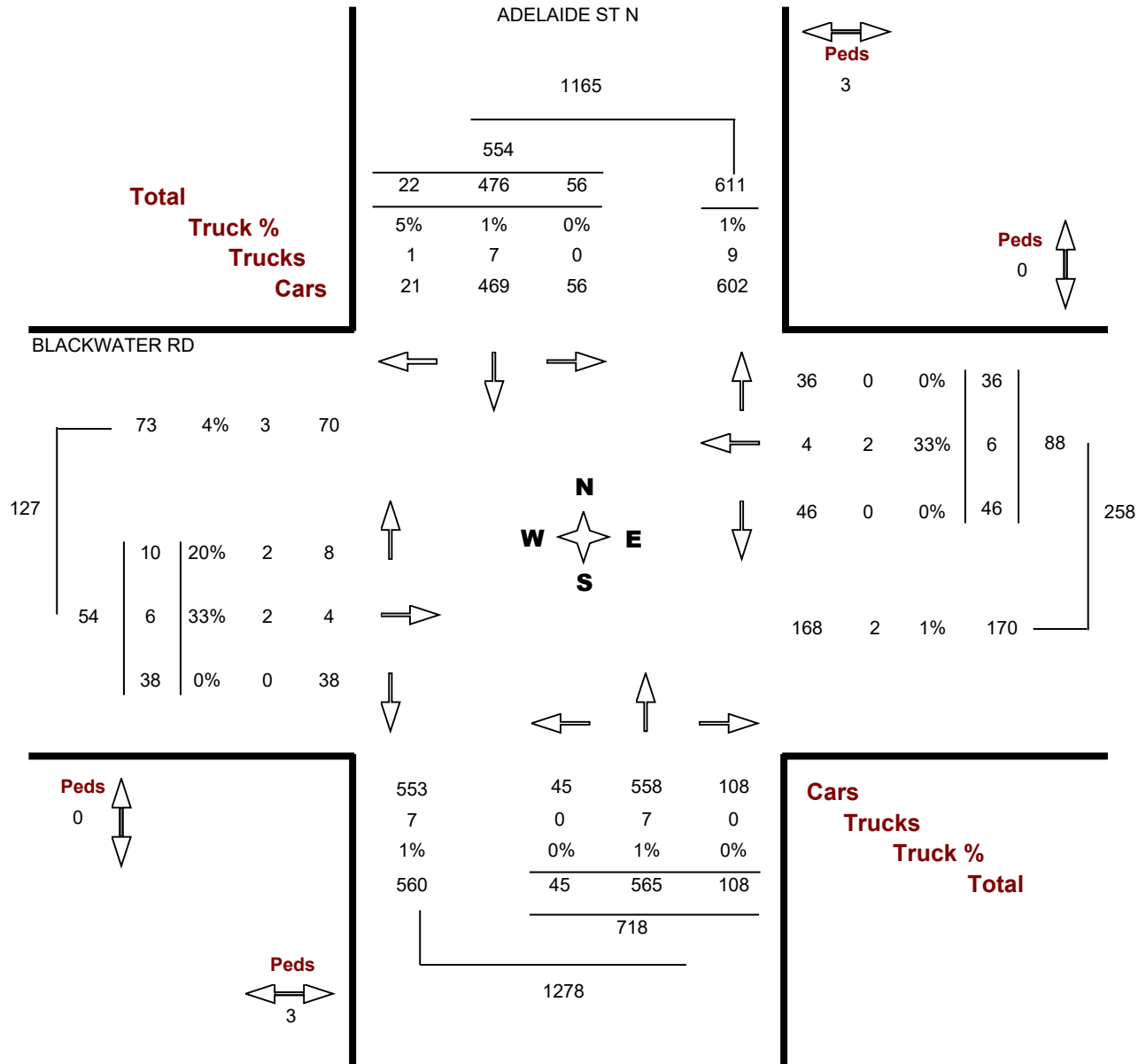
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Municipality..... LONDON

GeoID..... INT102

Count Date..... Thursday, 01 October, 2015

Peak Hour..... 04:45 PM — 05:45 PM





Turning Movements Report - AM Period

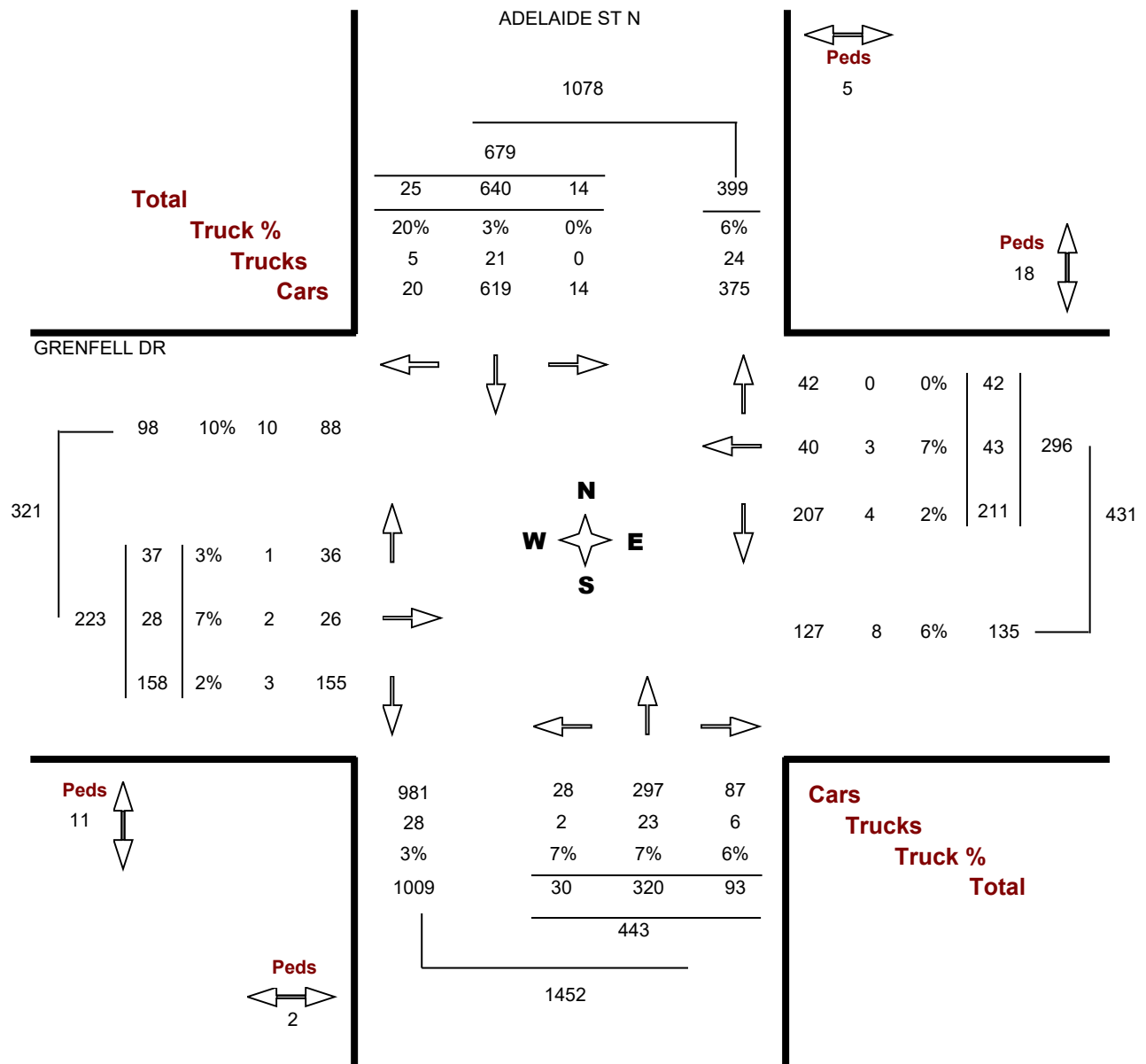
Location..... ADELAIDE ST N @ GRENFELL DR

Municipality..... LONDON

GeoID..... INT258

Count Date..... Thursday, 23 June, 2016

Peak Hour..... 07:45 AM — 08:45 AM





Turning Movements Report - MD Period

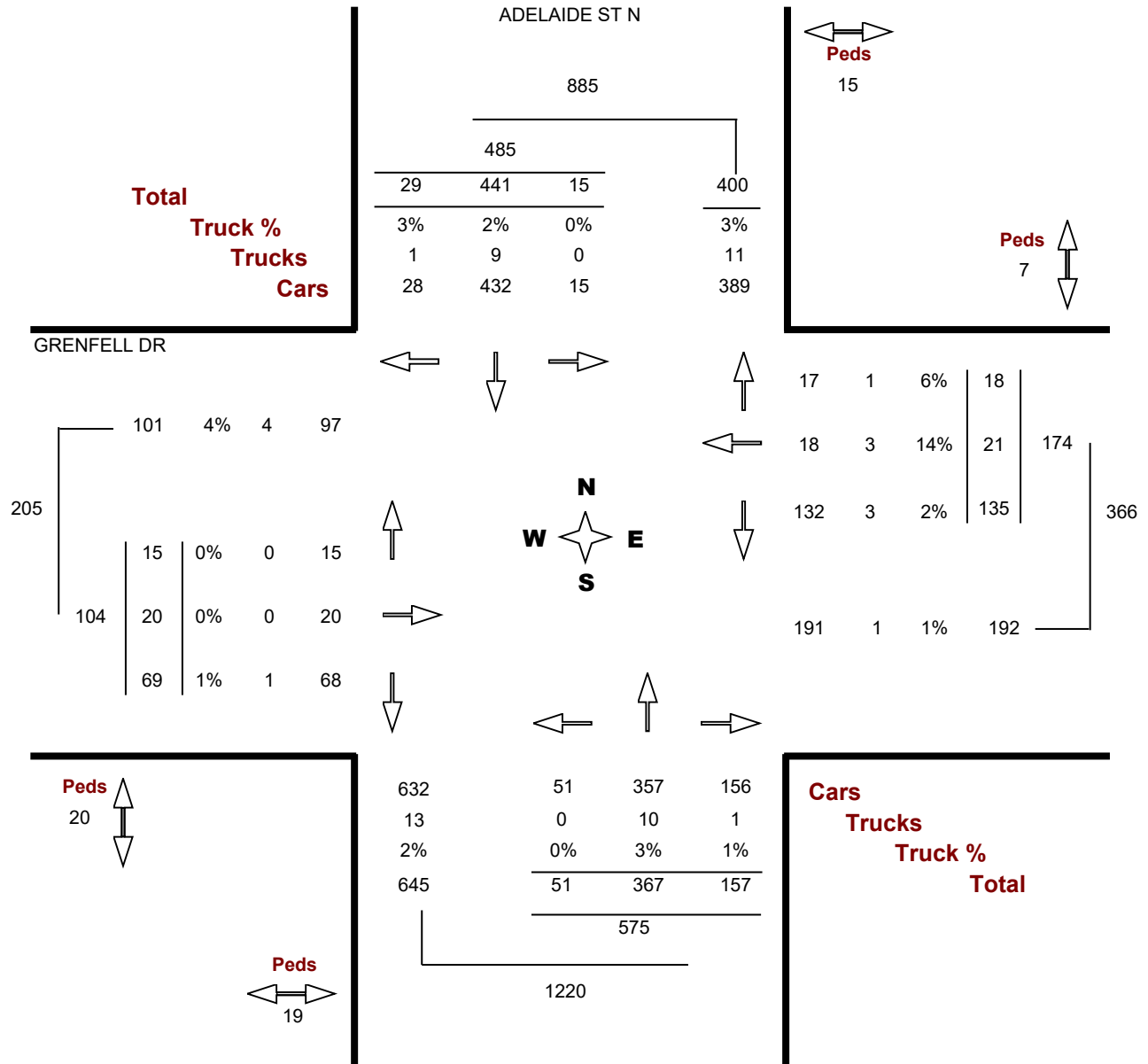
Location..... ADELAIDE ST N @ GRENFELL DR

Municipality..... LONDON

GeoID..... INT258

Count Date..... Thursday, 23 June, 2016

Peak Hour..... 11:15 AM — 12:15 PM





Turning Movements Report - PM Period

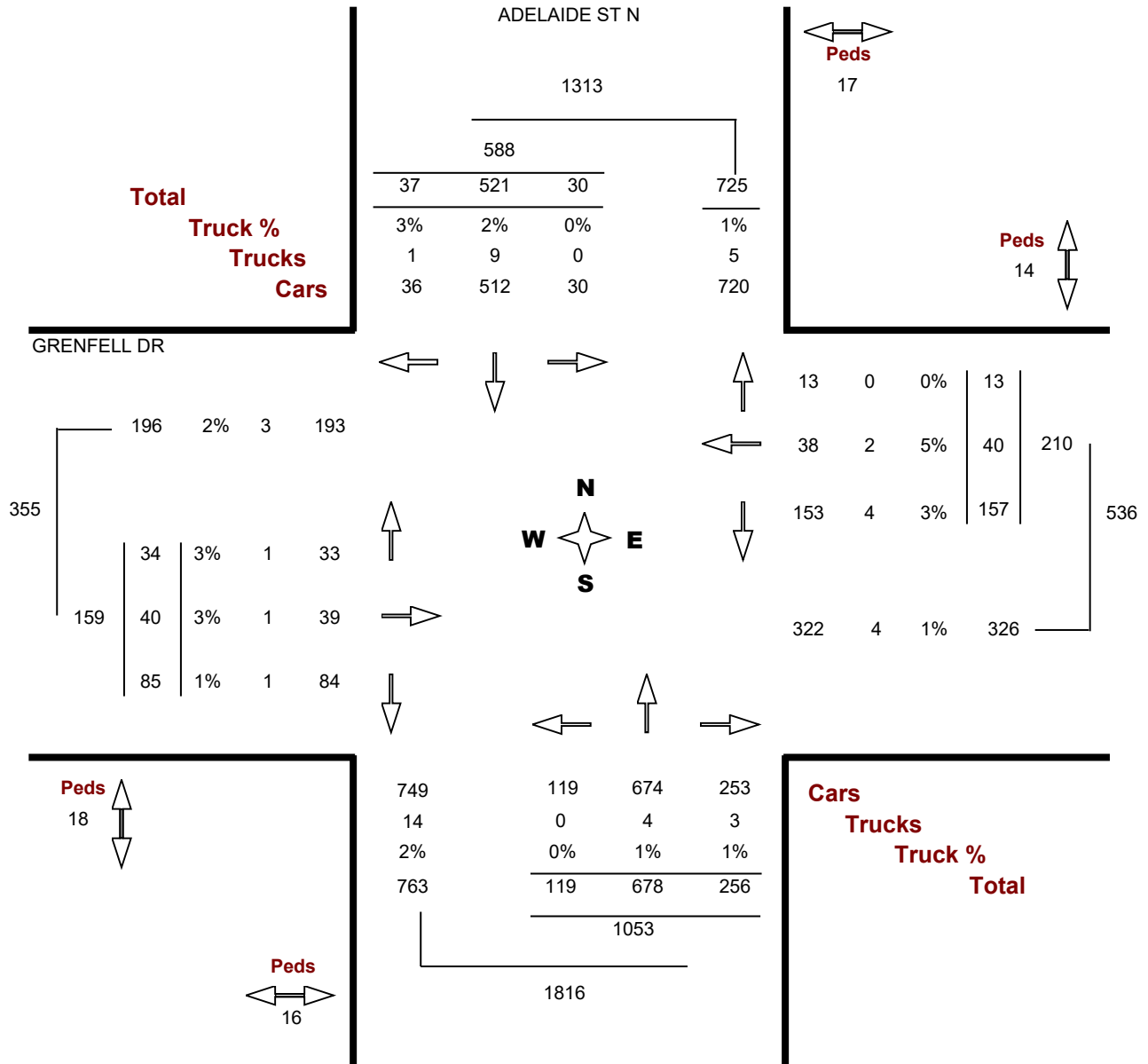
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Municipality..... LONDON

GeoID..... INT258

Count Date..... Thursday, 23 June, 2016

Peak Hour..... 04:30 PM — 05:30 PM





Turning Movements Report - AM Period

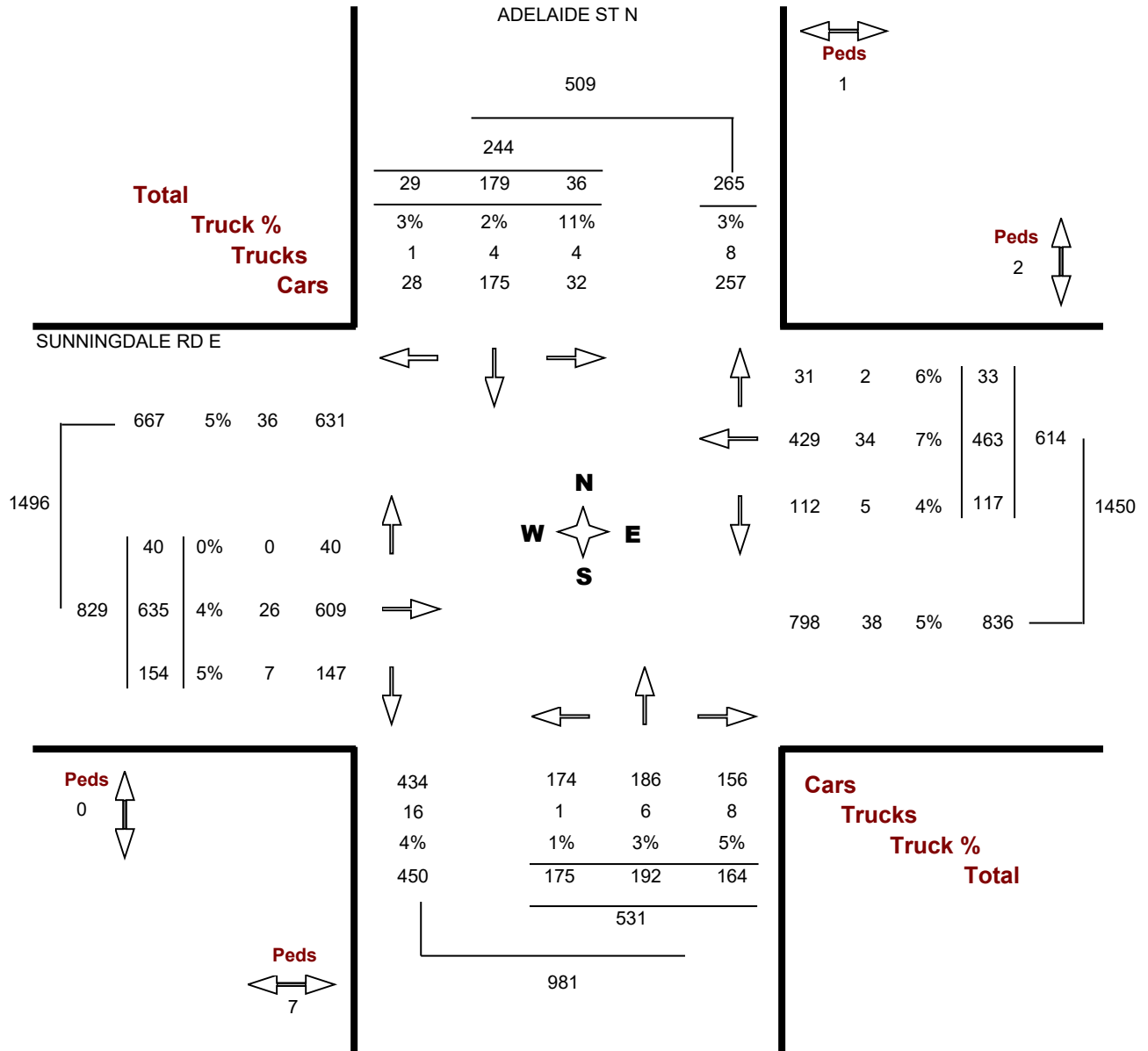
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Municipality..... LONDON

GeoID..... INT71

Count Date..... Monday, 25 September, 2017

Peak Hour..... 07:30 AM — 08:30 AM





Turning Movements Report - MD Period

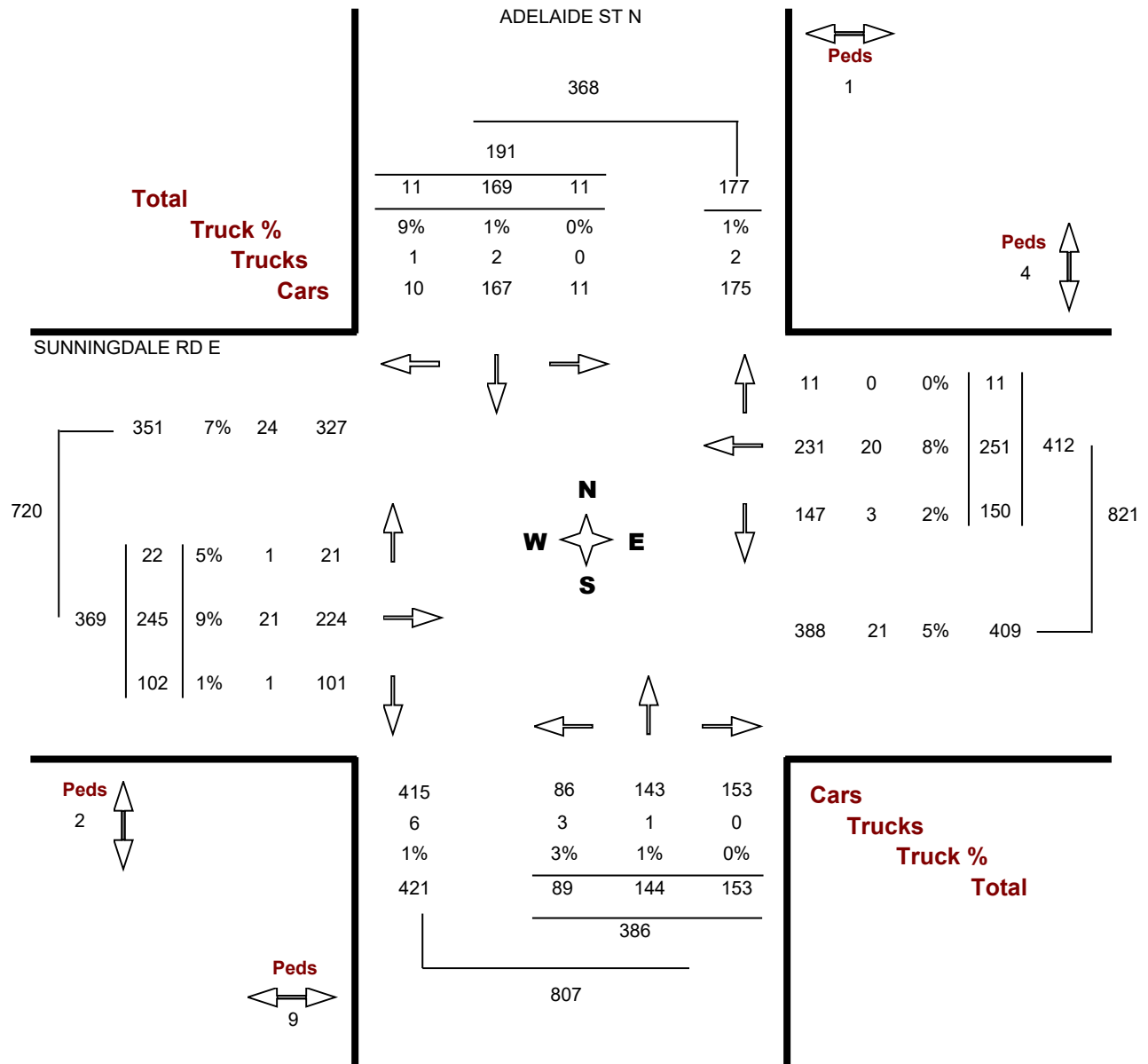
Location..... ADELAIDE ST N @ SUNNINGDALE RD E

Municipality..... LONDON

GeoID..... INT71

Count Date..... Monday, 25 September, 2017

Peak Hour..... 11:15 AM — 12:15 PM





Turning Movements Report - PM Period

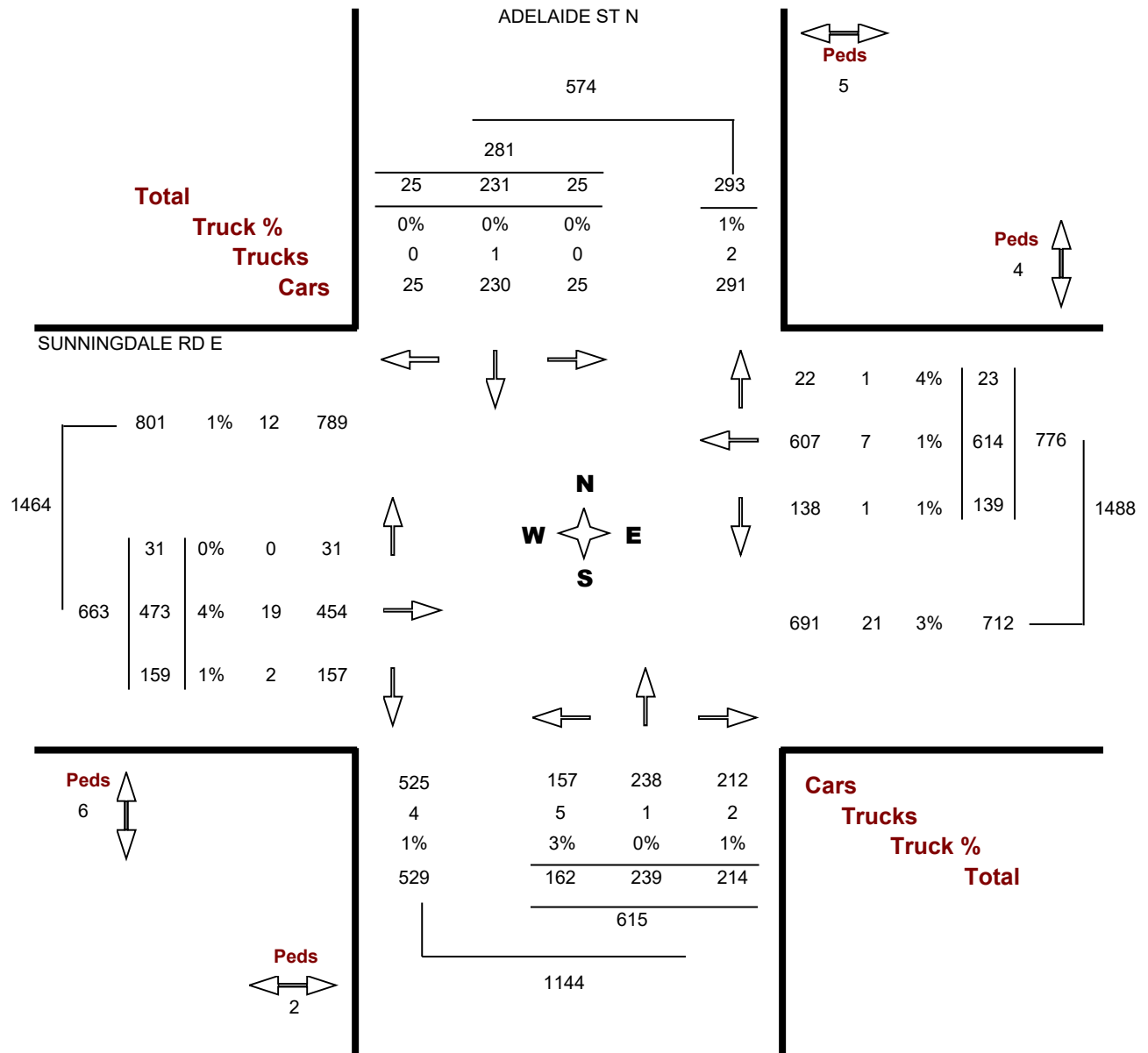
Location..... ADELAIDE ST N @ SUNNINGDALE RD E

Municipality..... LONDON

GeoID..... INT71

Count Date..... Monday, 25 September, 2017

Peak Hour..... 04:30 PM — 05:30 PM





Turning Movements Report - AM Period

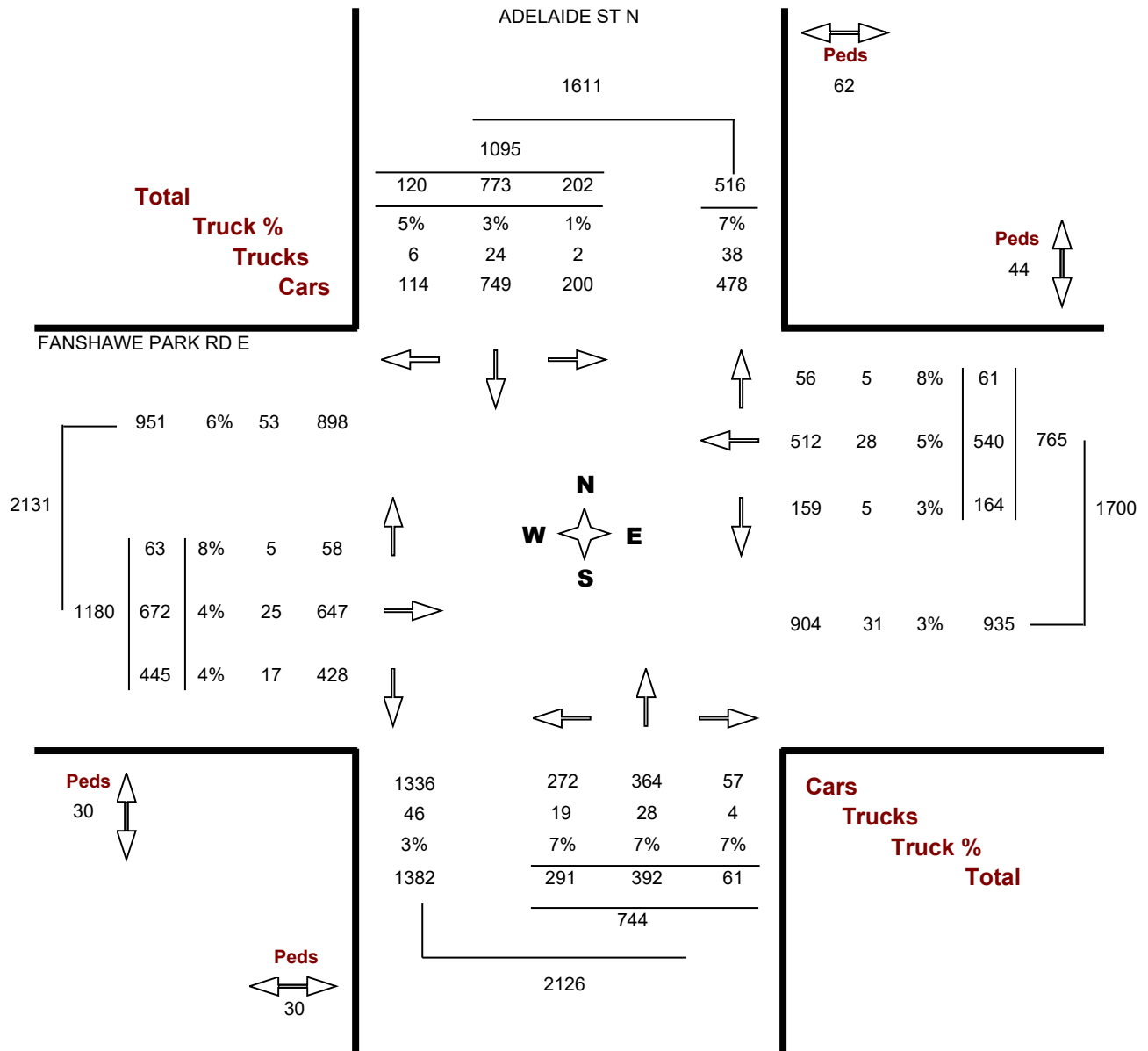
Location..... ADELAIDE ST N @ FANSHAWE PARK RD E

Municipality..... LONDON

GeoID..... INT337

Count Date..... Tuesday, 29 September, 2015

Peak Hour..... 07:45 AM — 08:45 AM





Turning Movements Report - MD Period

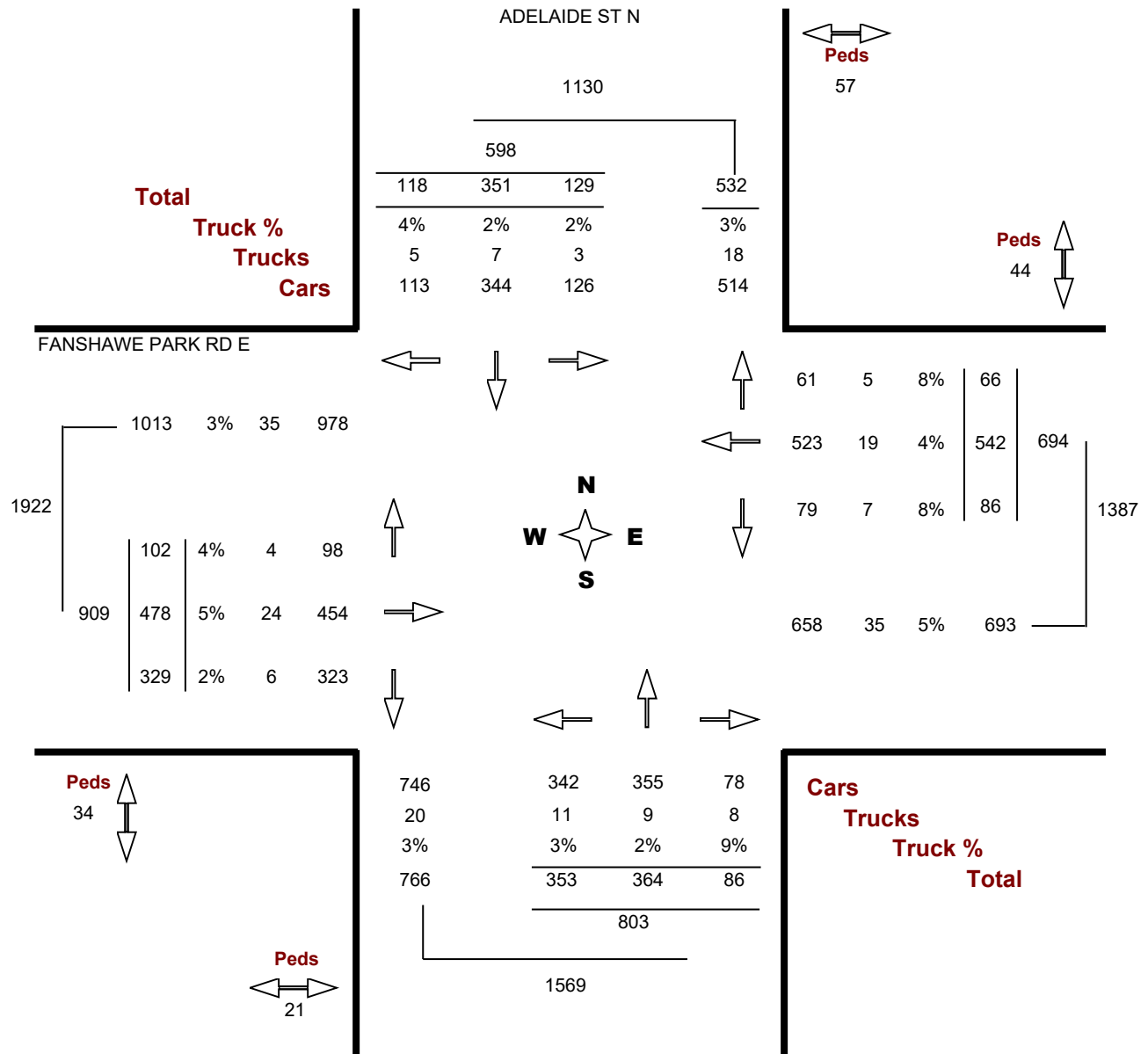
Location..... ADELAIDE ST N @ FANSHAWE PARK RD E

Municipality..... LONDON

GeoID..... INT337

Count Date..... Tuesday, 29 September, 2015

Peak Hour..... 12:00 PM — 01:00 PM





Turning Movements Report - PM Period

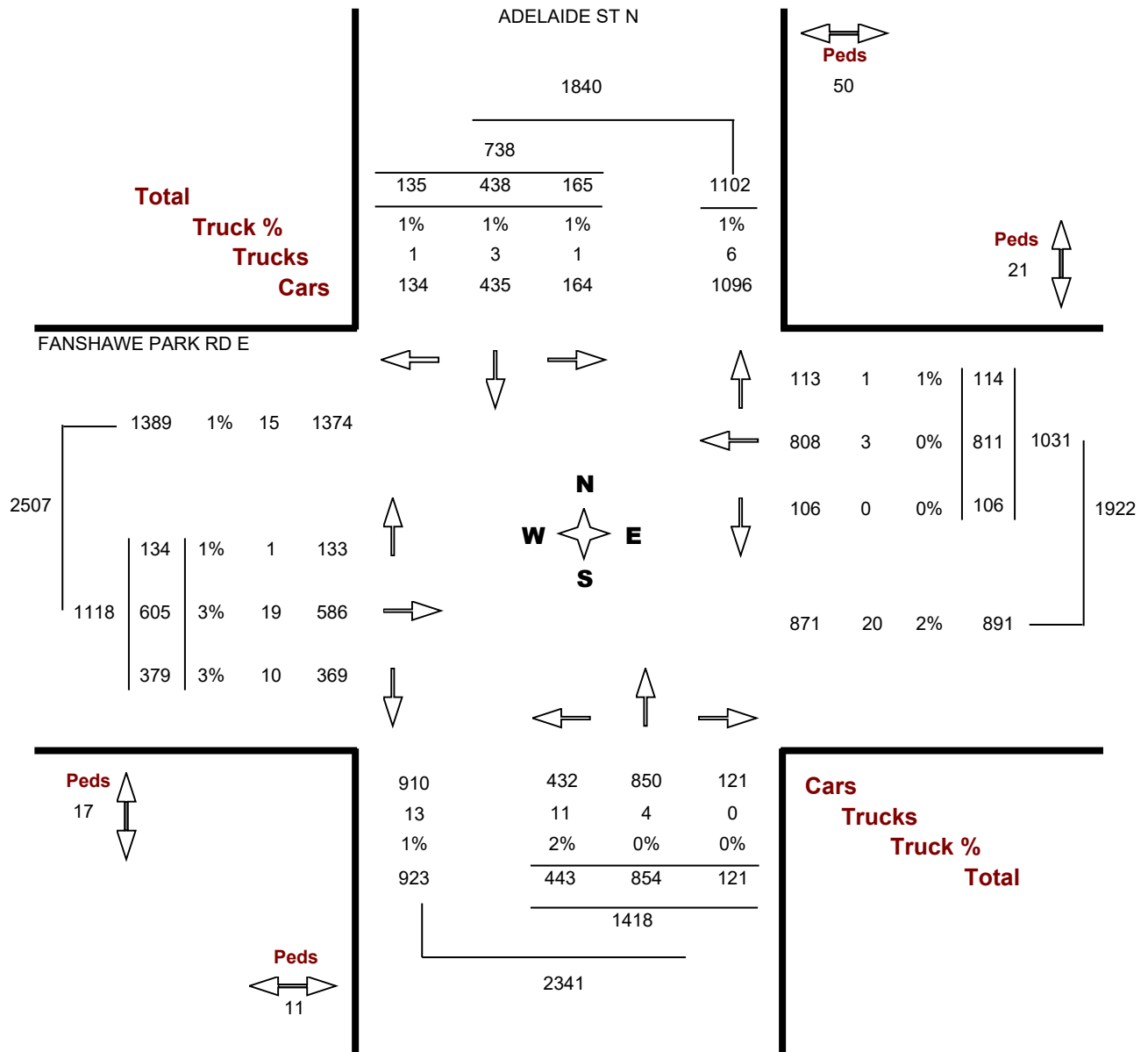
Location..... ADELAIDE ST N @ FANSHAWE PARK RD E

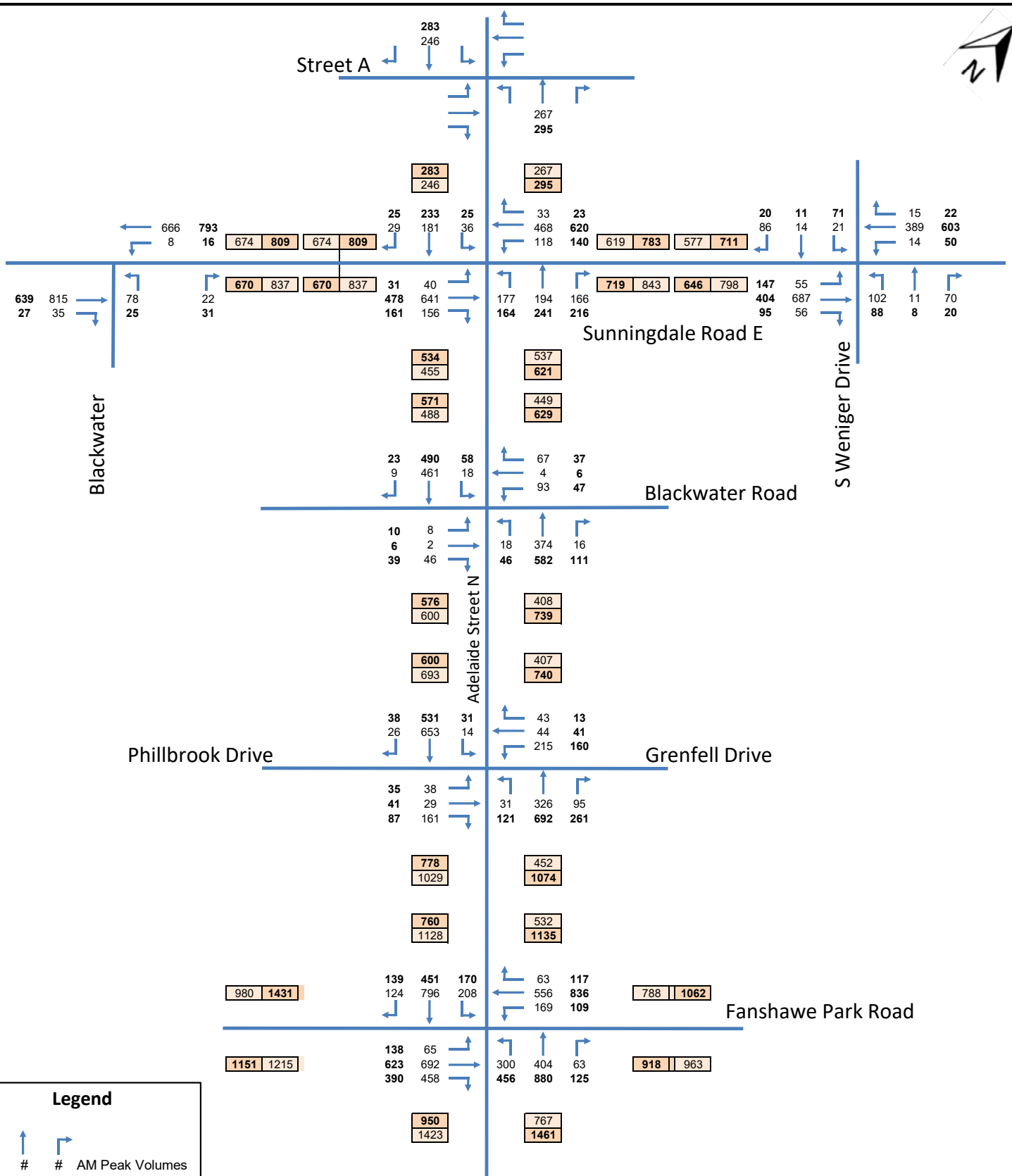
Municipality..... LONDON

GeoID..... INT337

Count Date..... Tuesday, 29 September, 2015

Peak Hour..... 04:45 PM — 05:45 PM





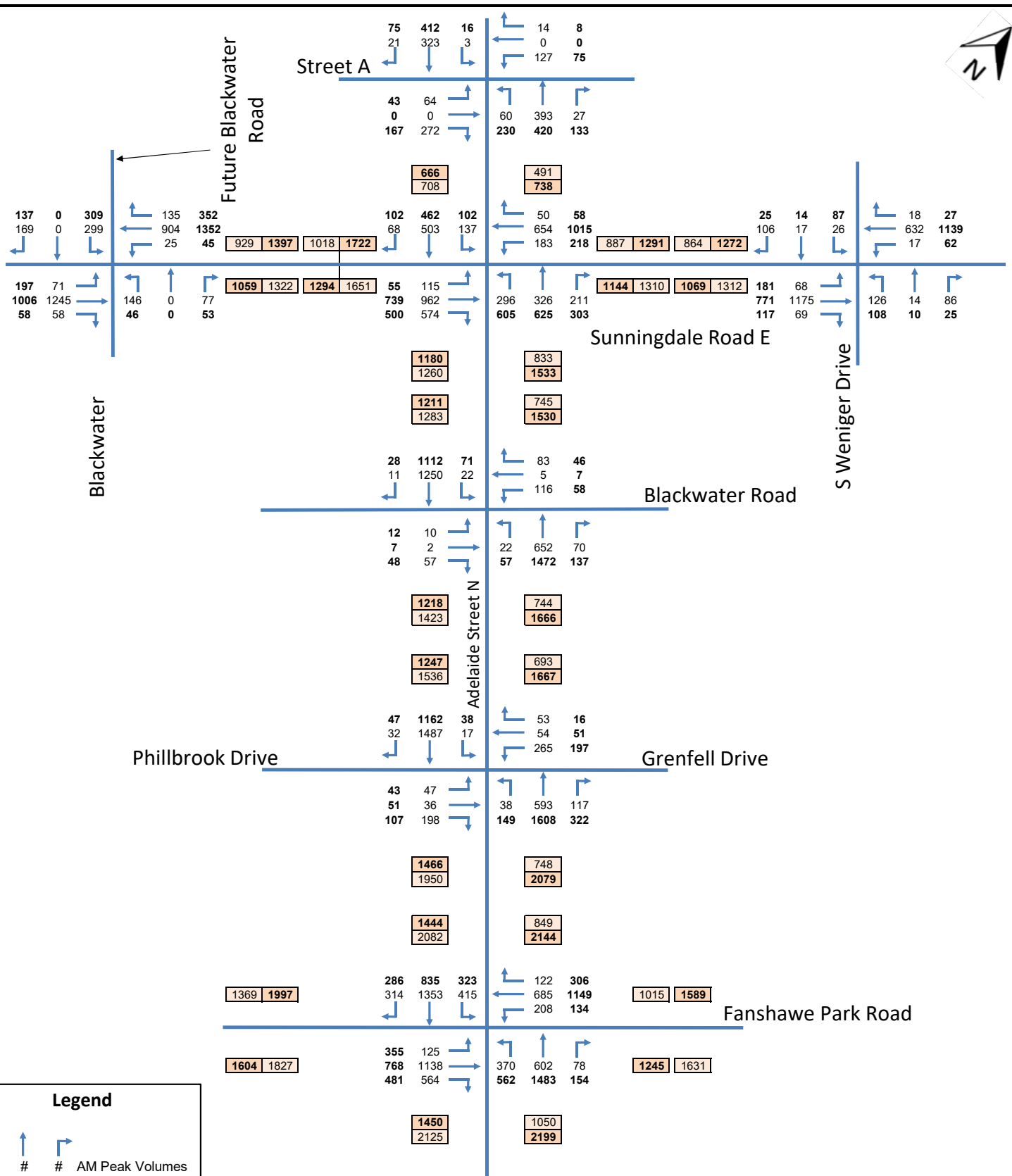
Legend

AM Peak Volumes
 # PM Peak Volumes
 # AM Peak Volumes
 # PM Peak Volumes

NOT TO SCALE

Existing (2018) Adjusted AM & PM Traffic Volumes
Adelaide Street EA Study





Legend

AM Peak Volumes
 # # # AM Peak Volumes
 # # # AM Peak Volumes
 # # # PM Peak Volumes
 # # # PM Peak Volumes
 # # # PM Peak Volumes

NOT TO SCALE

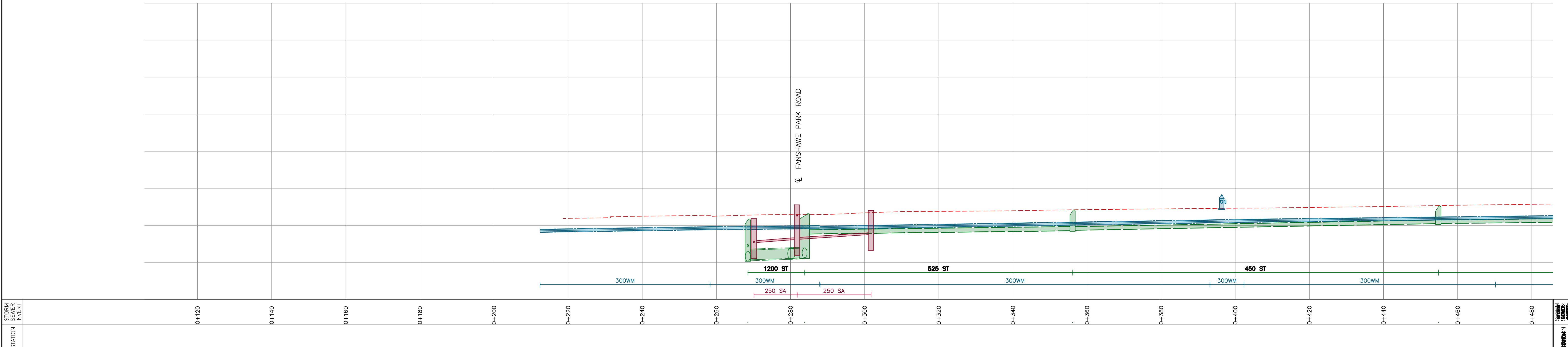
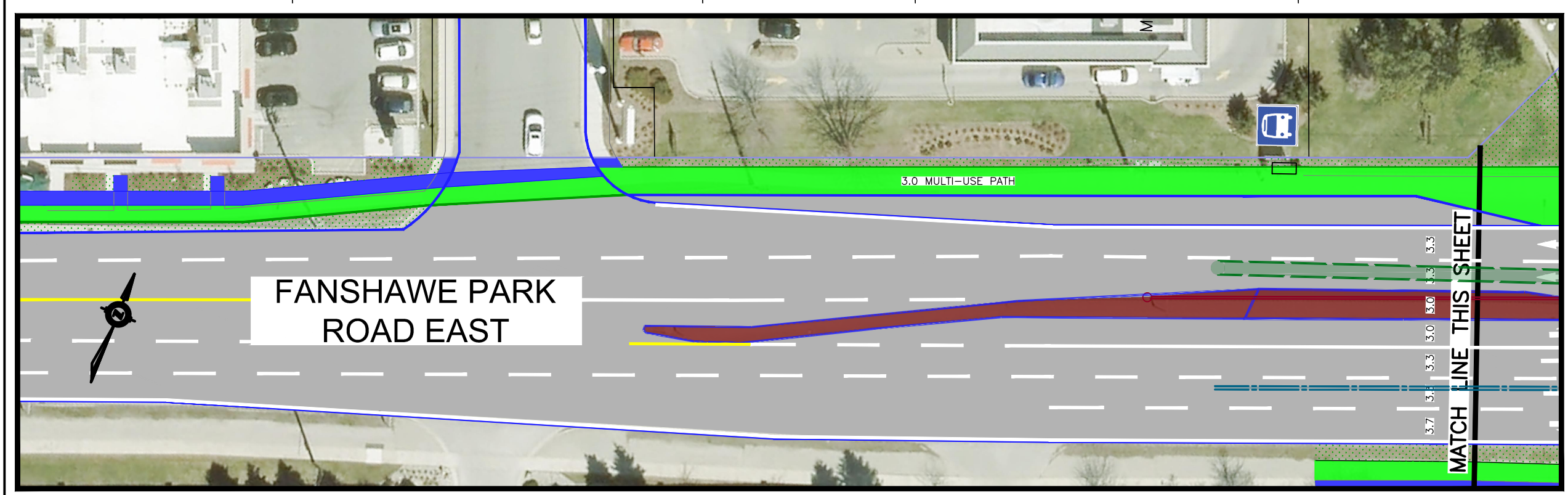
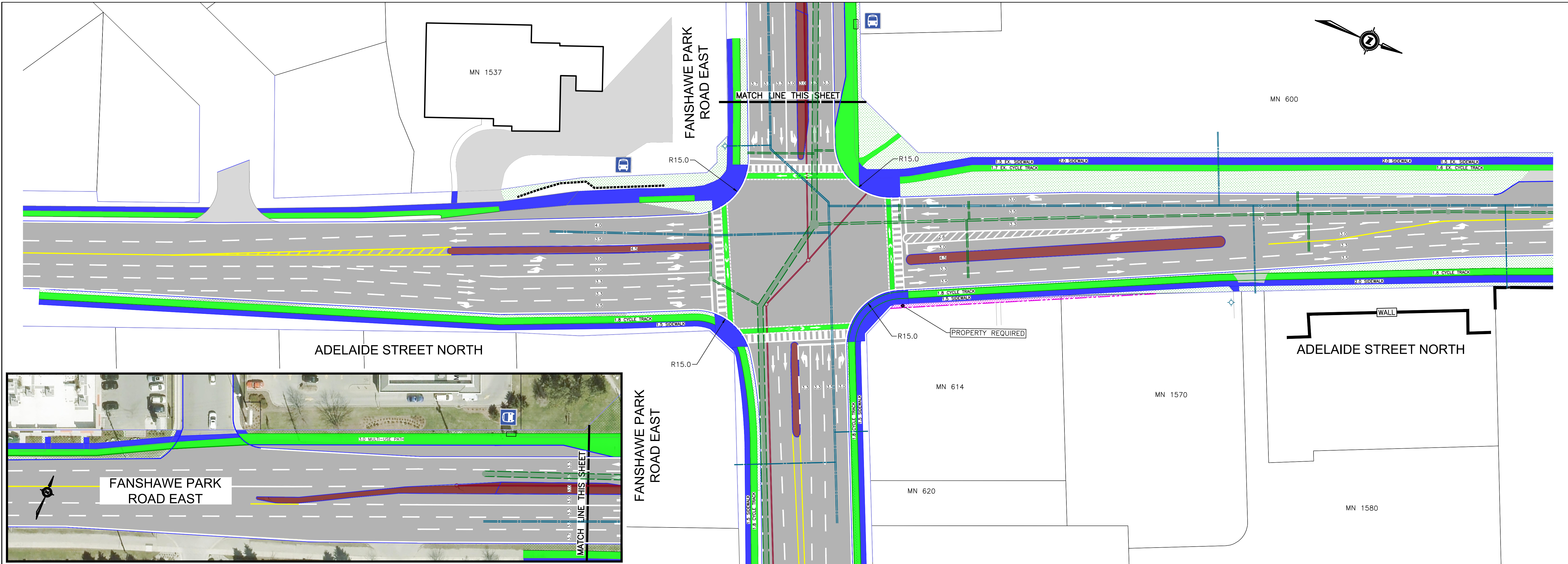
Future (2039) AM & PM Traffic Volumes
Adelaide Street EA Study



Appendix C

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purposes

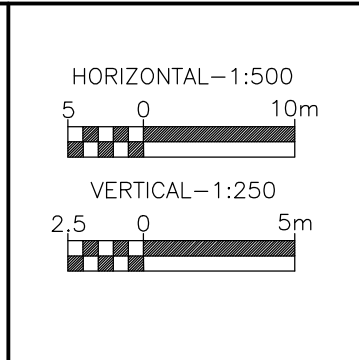
Job No. ----- DWG No.1 J:\DATA\476793 - Adelaide St. North\6E_Dwg\NewConst - EA\476793-Plan and Profile.dwg



LEGEND

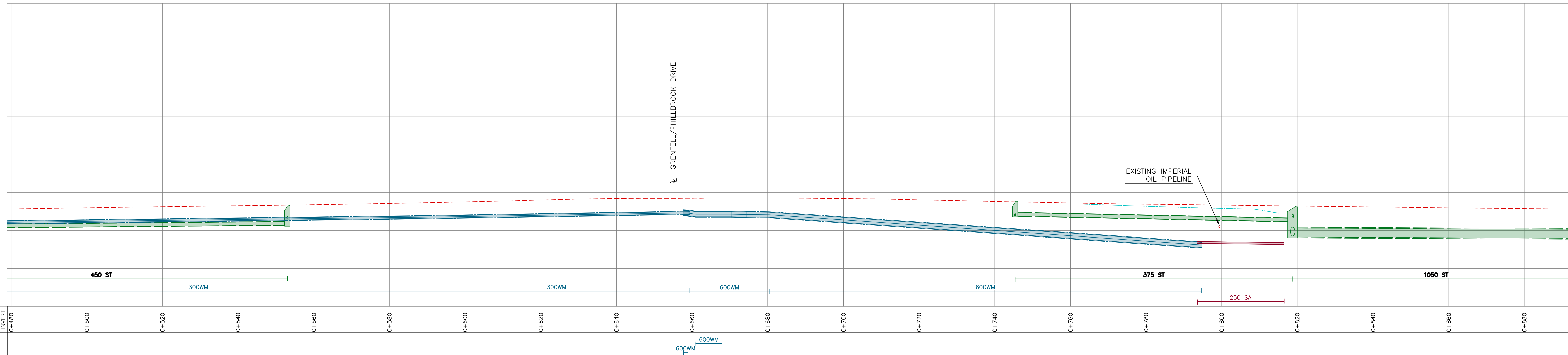
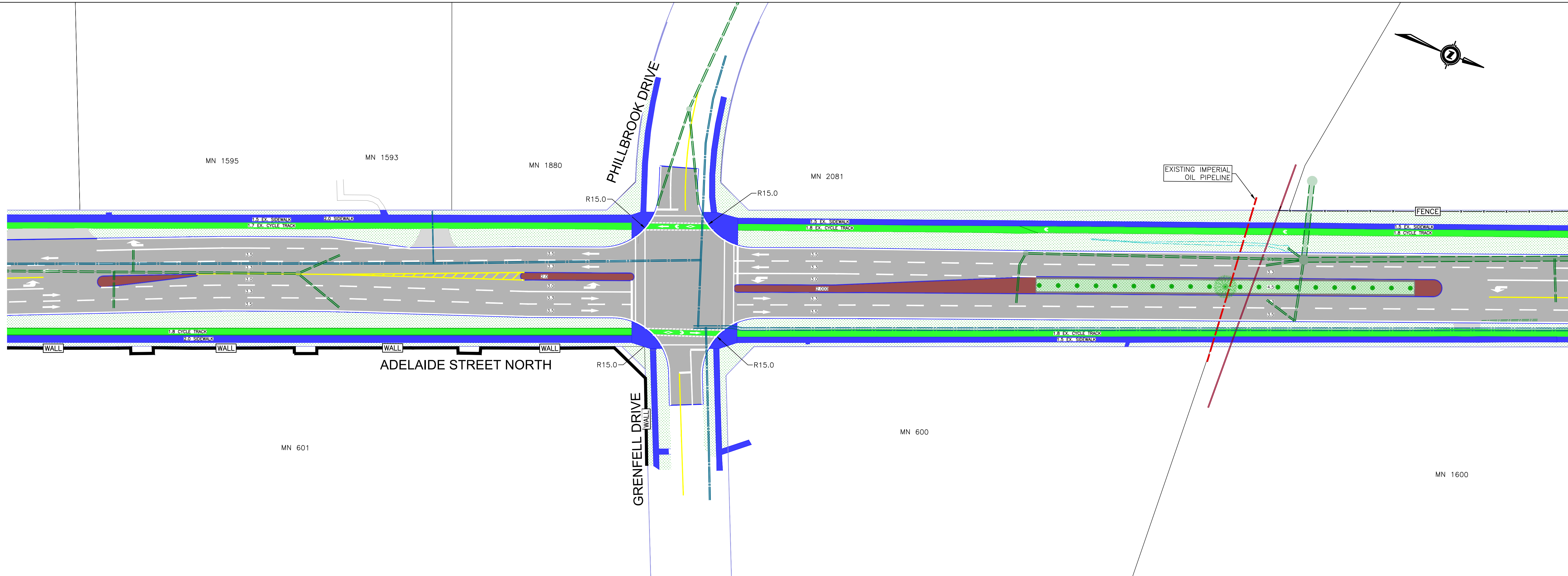
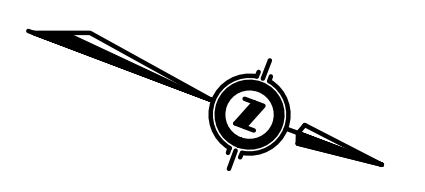
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	PROPOSED RIGHT-OF-WAY		EXISTING CYCLE TRACK
	EXISTING GROUND PROFILE		PROPOSED ROAD
	FUTURE ROAD PROFILE		PROPOSED BICYCLE LANE
	PROPERTY REQUIRED FOR ADDITIONAL RIGHT OF WAY		PROPOSED SIDEWALK
			PROPOSED CYCLE TRACK

	PROPERTY LINE		EXISTING SIDEWALK
	PROPOSED RIGHT-OF-WAY		EXISTING CYCLE TRACK
	EXISTING GROUND PROFILE		PROPOSED ROAD
	FUTURE ROAD PROFILE		PROPOSED BICYCLE LANE
	PROPERTY REQUIRED FOR ADDITIONAL RIGHT OF WAY		PROPOSED SIDEWALK
			PROPOSED CYCLE TRACK



ADELAIDE STREET NORTH
 FANSHAWE PARK ROAD TO SUNNINGDALE
RECOMMENDED ALTERNATIVE
 ADELAIDE STREET NORTH STA 0+000 TO STA 0+480

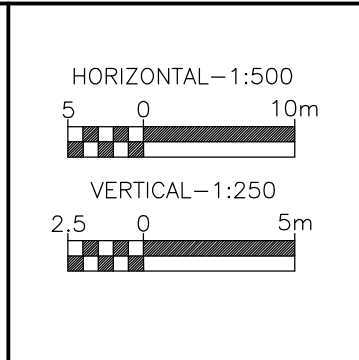
PROJECT No.	-----
PLATE No.	1



Job No. --- DWG No.2 - Adelaide St. North\6E_Dwg\NewConst - EA\476793-Plan and Profile.dwg



LEGEND	
	PROPERTY LINE
	PROPOSED RIGHT-OF-WAY
	EXISTING GROUND PROFILE
	FUTURE ROAD PROFILE
	PROPERTY REQUIRED FOR ADDITIONAL RIGHT OF WAY
	EXISTING SIDEWALK
	EXISTING CYCLE TRACK
	PROPOSED ROAD
	PROPOSED BICYCLE LANE
	PROPOSED SIDEWALK
	PROPOSED CYCLE TRACK

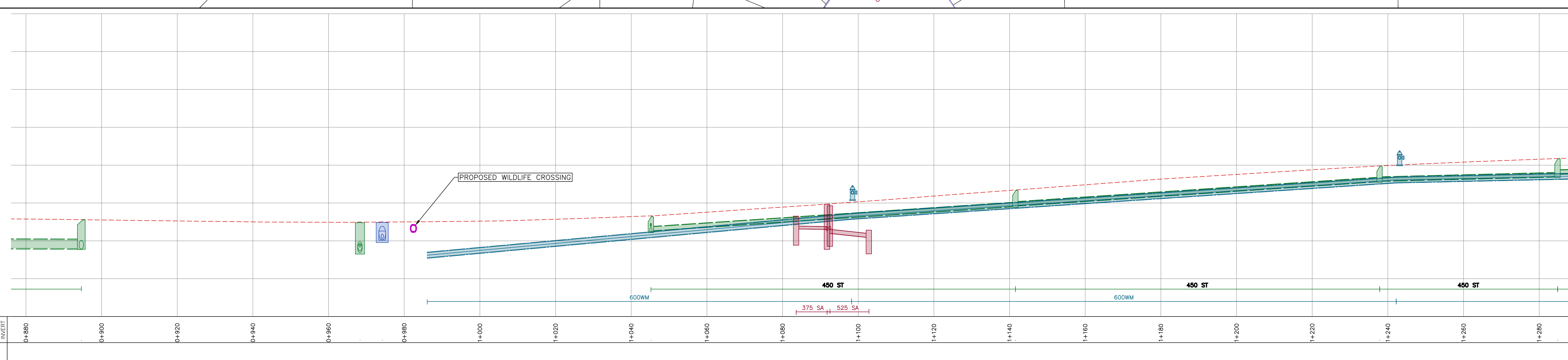
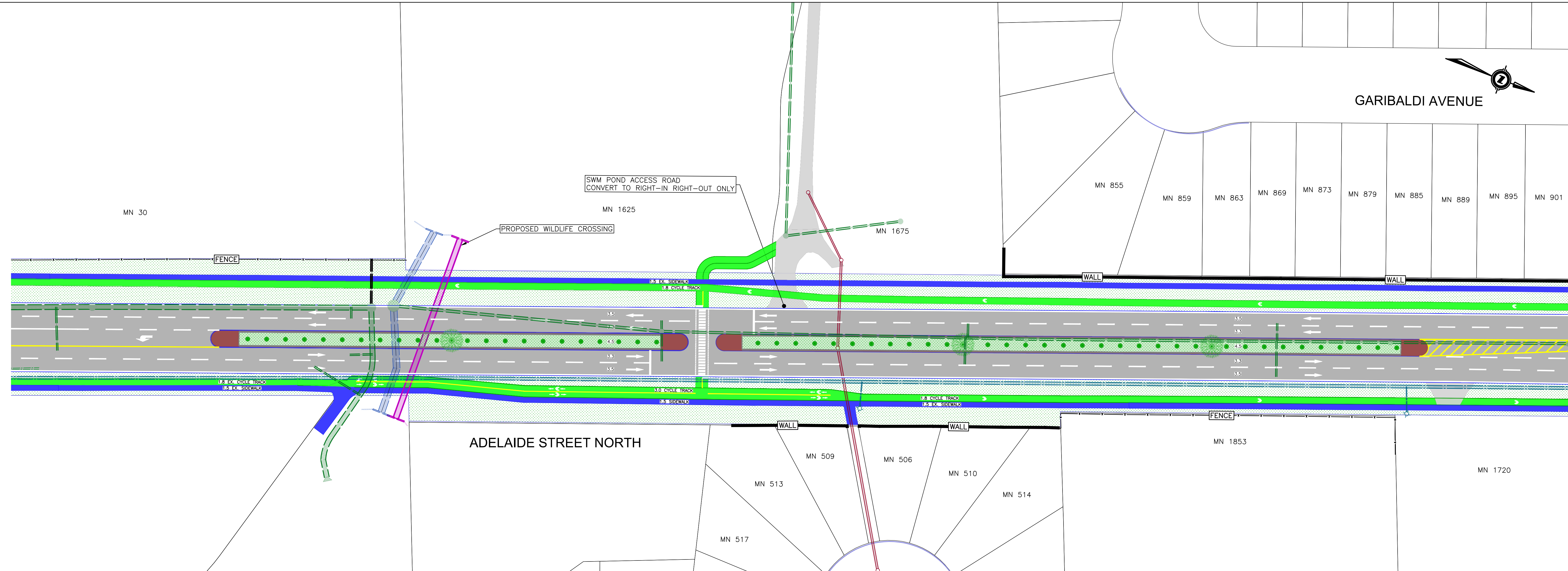


ADELAIDE STREET NORTH
FANSHAWE PARK ROAD TO SUNNINGDALE

RECOMMENDED ALTERNATIVE

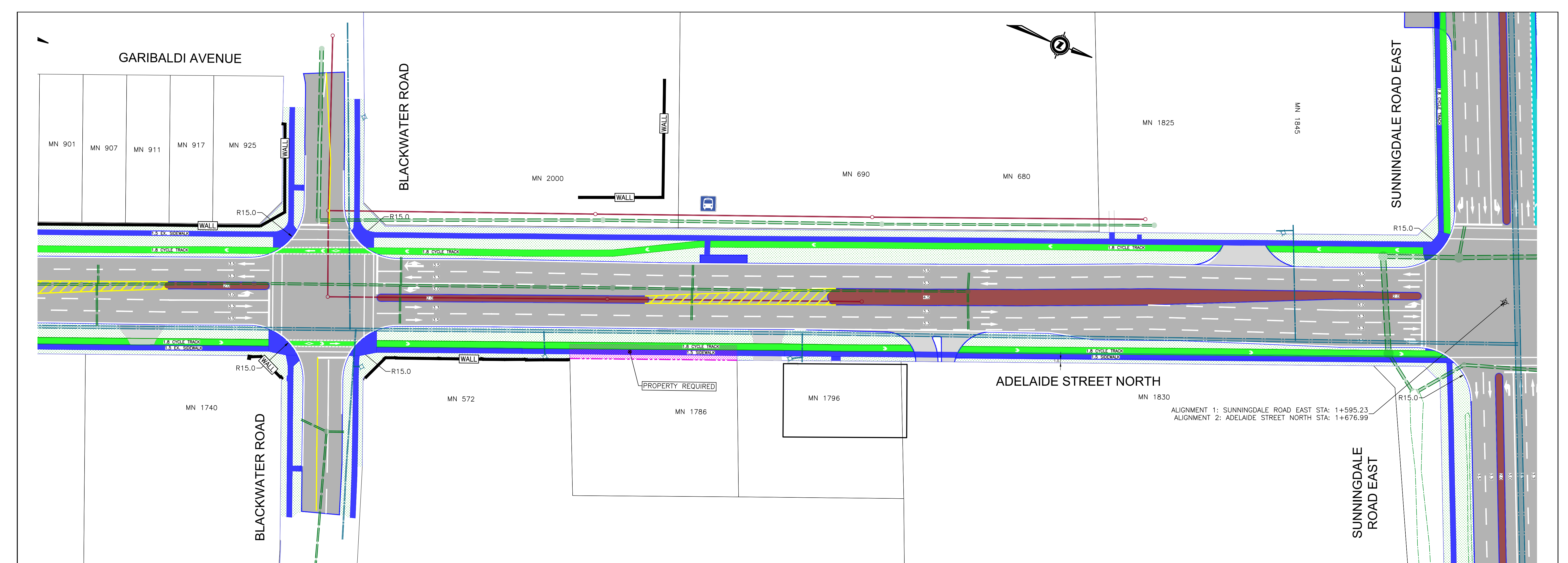
ADELAIDE STREET NORTH STA 0+480 TO STA 0+880

PROJECT No.	---
PLATE No.	2

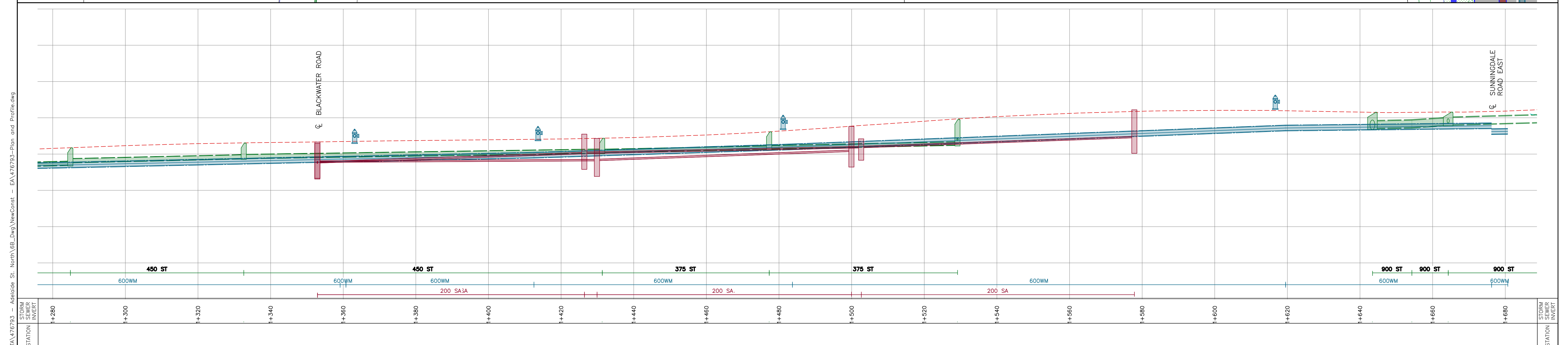


Job No. --- DWG No.3 J:\DATA\476793 - Adelaide St. North\6E_Dwg\NewConst - EA\476793-Plan and Profile.dwg

 	LEGEND PROPERTY LINE PROPOSED RIGHT-OF-WAY EXISTING GROUND PROFILE FUTURE ROAD PROFILE PROPERTY REQUIRED FOR ADDITIONAL RIGHT OF WAY	EXISTING SIDEWALK EXISTING CYCLE TRACK PROPOSED ROAD PROPOSED BICYCLE LANE PROPOSED SIDEWALK PROPOSED CYCLE TRACK	HORIZONTAL - 1:500 VERTICAL - 1:250 	PROJECT No. --- PLATE No. 3
	ADELAIDE STREET NORTH FANSHAW PARK ROAD TO SUNNINGDALE RECOMMENDED ALTERNATIVE			
	ADELAIDE STREET NORTH STA 0+880 TO STA 1+280			

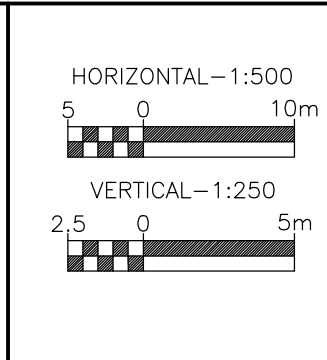


ALIGNMENT 1: SUNNINGDALE ROAD EAST STA: 1+595.23
 ALIGNMENT 2: ADELAIDE STREET NORTH STA: 1+676.99



LEGEND

	PROPERTY LINE		EXISTING SIDEWALK
	PROPOSED RIGHT-OF-WAY		EXISTING CYCLE TRACK
	EXISTING GROUND PROFILE		PROPOSED ROAD
	FUTURE ROAD PROFILE		PROPOSED BICYCLE LANE
	PROPERTY REQUIRED FOR ADDITIONAL RIGHT OF WAY		PROPOSED SIDEWALK
			PROPOSED CYCLE TRACK



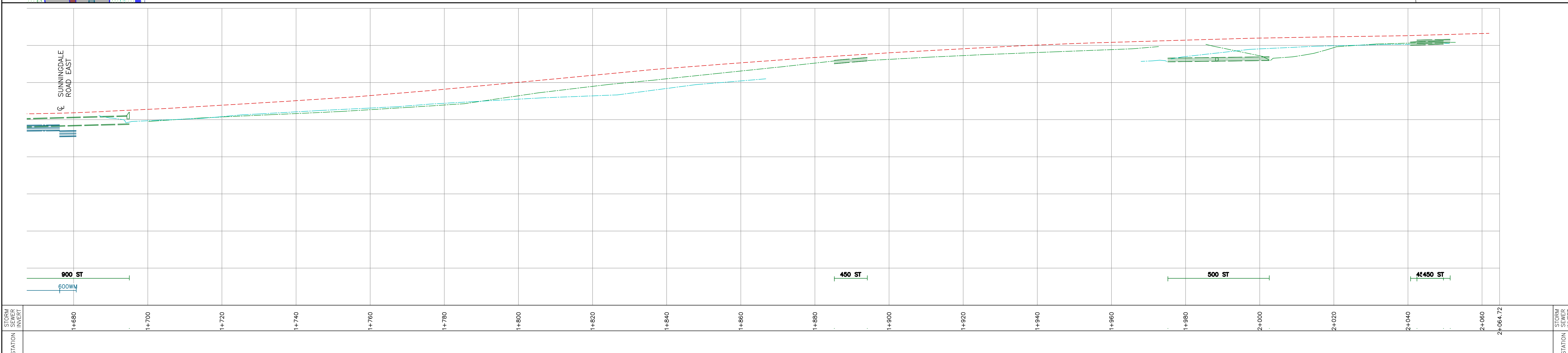
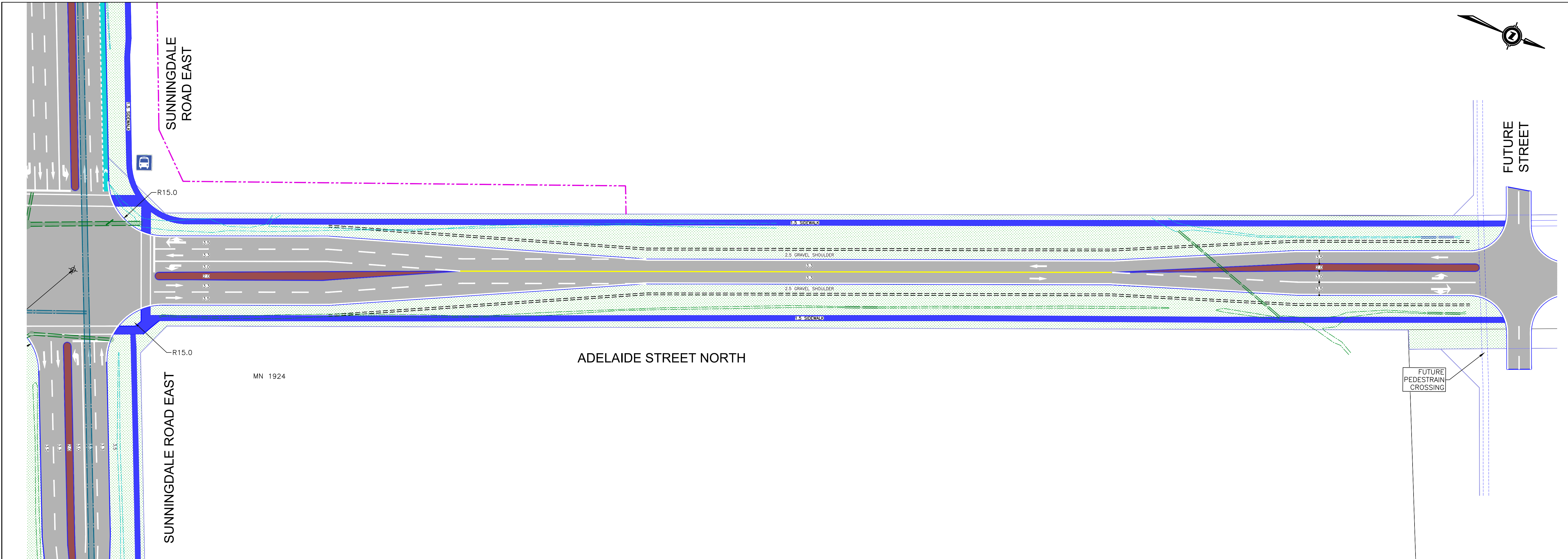
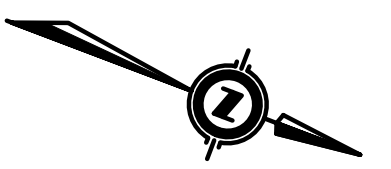
ADELAIDE STREET NORTH
 FANSHAW PARK ROAD TO SUNNINGDALE

RECOMMENDED ALTERNATIVE

ADELAIDE STREET NORTH STA 1+280 TO STA 1+680

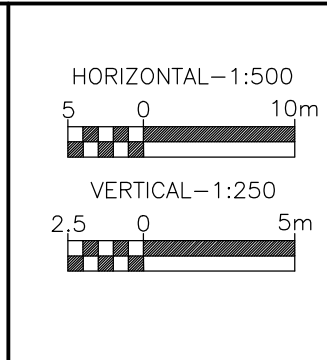
PROJECT No.	-----
PLATE No.	4

Job No. ----- DWG No.4 J:\DATA\476793 - Adelaide St. North\6E_Dwg\NewConst - EA\476793-Plan and Profile.dwg



LEGEND

	PROPERTY LINE		EXISTING SIDEWALK
	PROPOSED RIGHT-OF-WAY		EXISTING CYCLE TRACK
	EXISTING GROUND PROFILE		PROPOSED ROAD
	FUTURE ROAD PROFILE		PROPOSED BICYCLE LANE
	PROPERTY REQUIRED FOR ADDITIONAL RIGHT OF WAY		PROPOSED SIDEWALK
			PROPOSED CYCLE TRACK



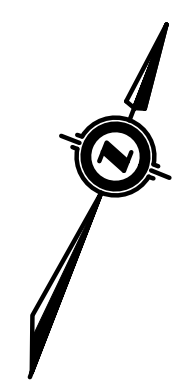
ADELAIDE STREET NORTH
 FANSHAWE PARK ROAD TO SUNNINGDALE

RECOMMENDED ALTERNATIVE

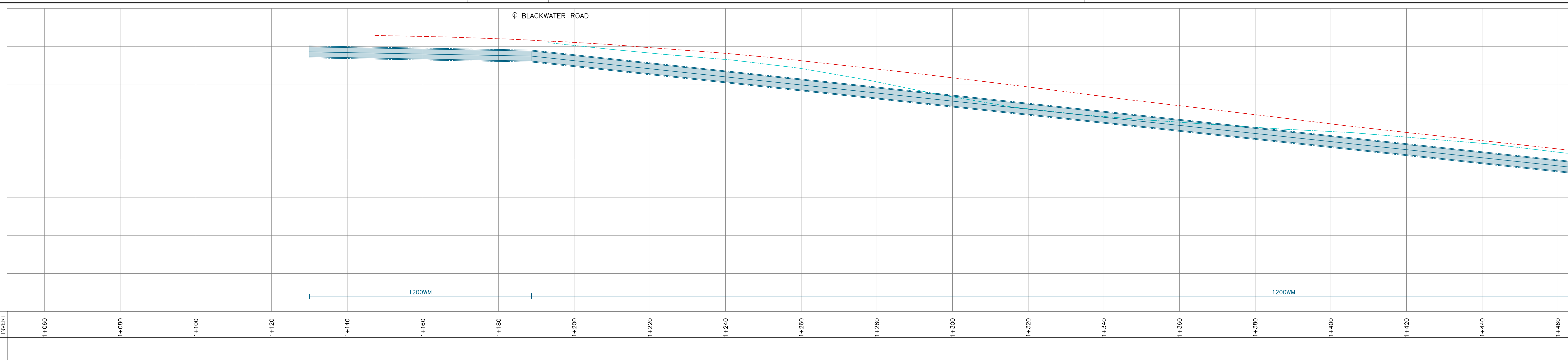
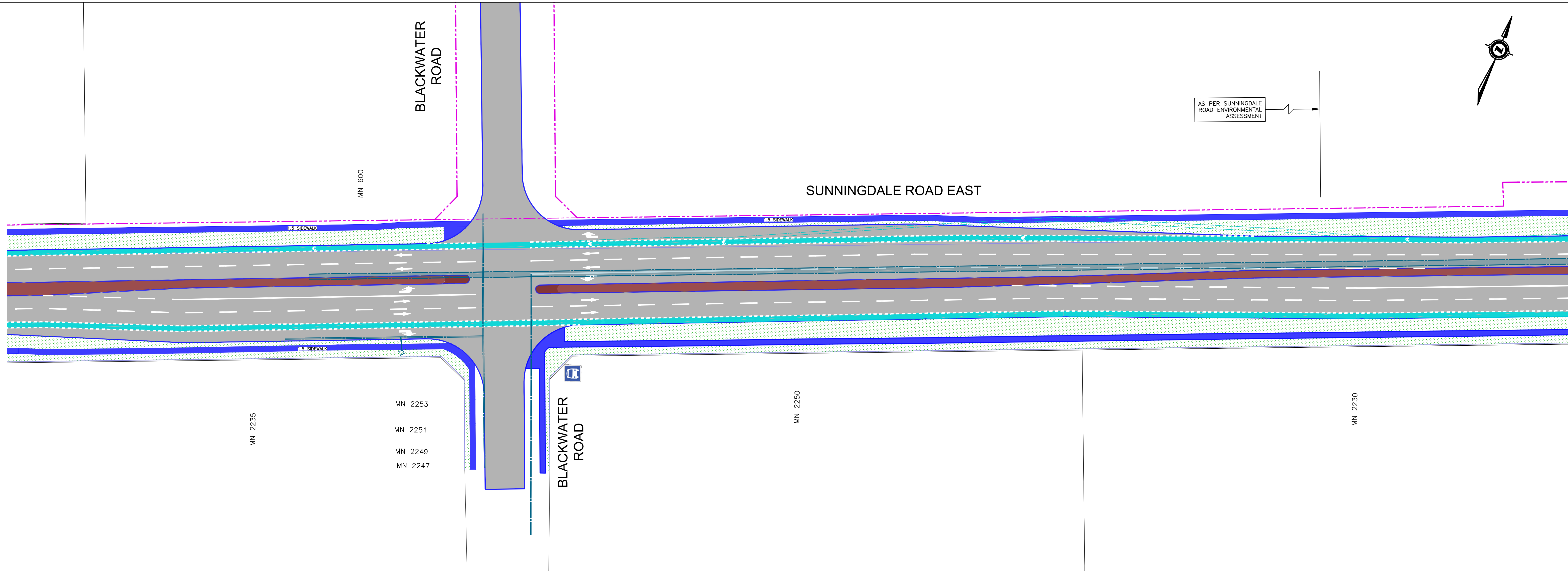
ADELAIDE STREET NORTH STA 1+680 TO STA 2+065

PROJECT No.	-----
PLATE No.	5

Job No. ----- DWG No.5 J:\DATA\476793 - Adelaide St. North\6E_Dwg\NewConst - EA\476793-Plan and Profile.dwg



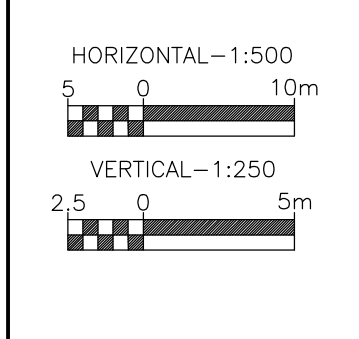
AS PER SUNNINGDALE ROAD ENVIRONMENTAL ASSESSMENT



LEGEND

- PROPERTY LINE
- PROPOSED RIGHT-OF-WAY
- EXISTING GROUND PROFILE
- FUTURE ROAD PROFILE
- PROPERTY REQUIRED FOR ADDITIONAL RIGHT OF WAY

- EXISTING SIDEWALK
- EXISTING CYCLE TRACK
- PROPOSED ROAD
- PROPOSED BICYCLE LANE
- PROPOSED SIDEWALK
- PROPOSED CYCLE TRACK



ADELAIDE STREET NORTH
FANSHAWE PARK ROAD TO SUNNINGDALE

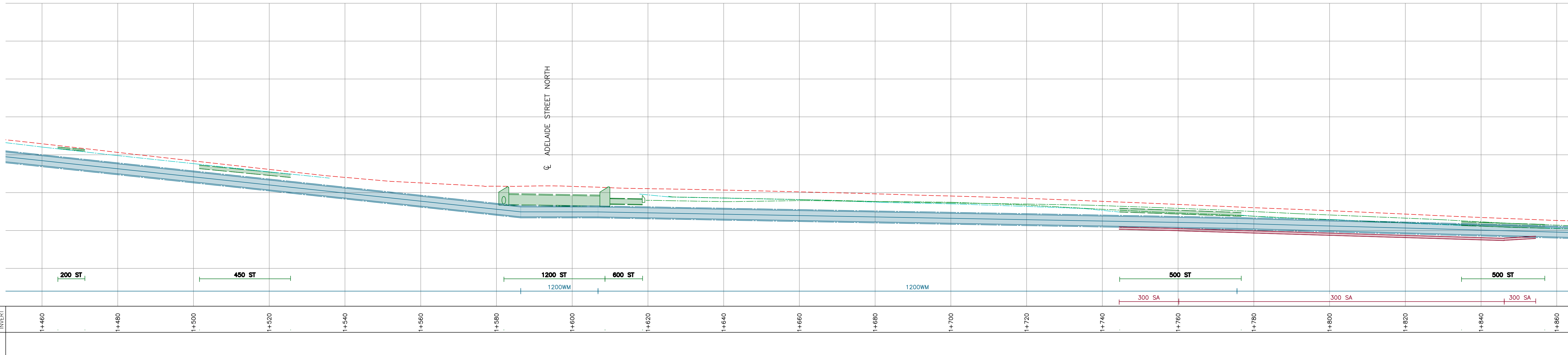
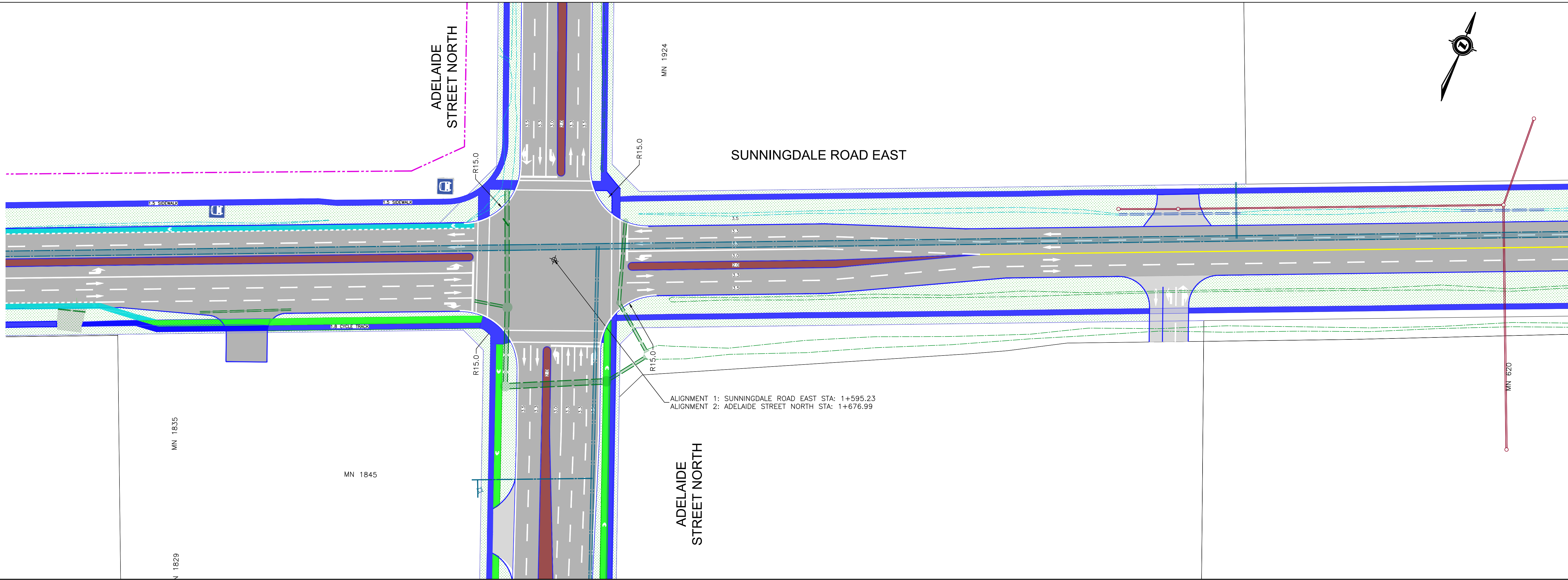
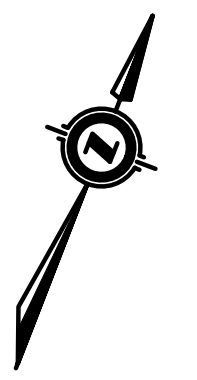
RECOMMENDED ALTERNATIVE

SUNNINGDALE ROAD STA 1+060 TO STA 1+460

PROJECT No. -----

PLATE No. **6**

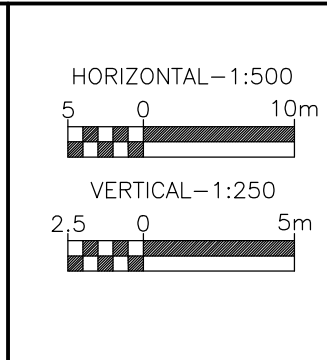
Job No. ----- DWG No.6 J:\DATA\476793 - Adelaide St. North\6E_Dwg\NewConst - EA\476793-Plan and Profile.dwg



Job No. ----- DWG No.7 J:\DATA\476793 - Adelaide St. North\6E_Dwg\NewConst - EA\476793-Plan and Profile.dwg



LEGEND	
	PROPERTY LINE
	PROPOSED RIGHT-OF-WAY
	EXISTING GROUND PROFILE
	FUTURE ROAD PROFILE
	PROPERTY REQUIRED FOR ADDITIONAL RIGHT OF WAY
	EXISTING SIDEWALK
	EXISTING CYCLE TRACK
	PROPOSED ROAD
	PROPOSED BICYCLE LANE
	PROPOSED SIDEWALK
	PROPOSED CYCLE TRACK



ADELAIDE STREET NORTH
 FANSHAWE PARK ROAD TO SUNNINGDALE

RECOMMENDED ALTERNATIVE

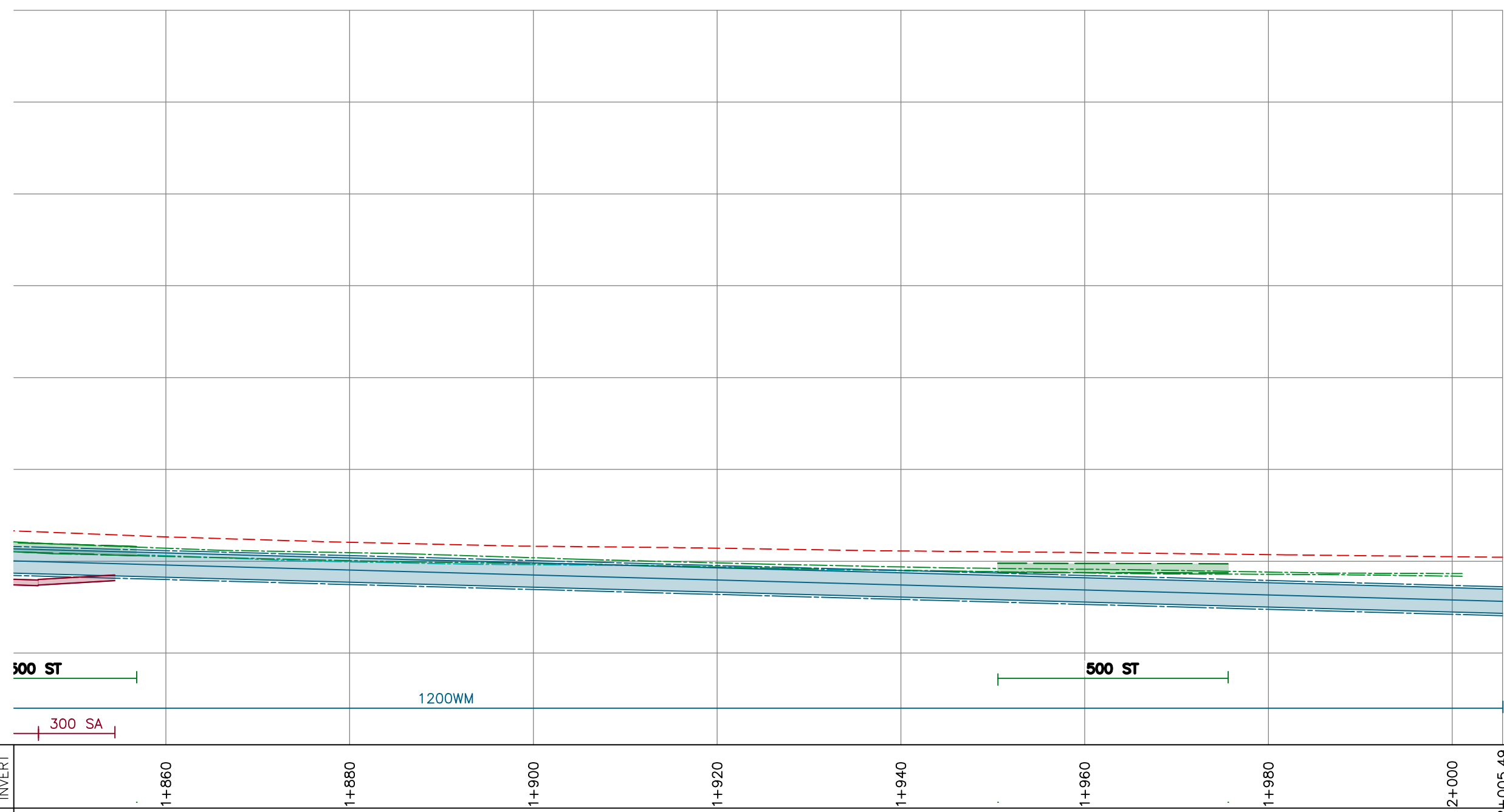
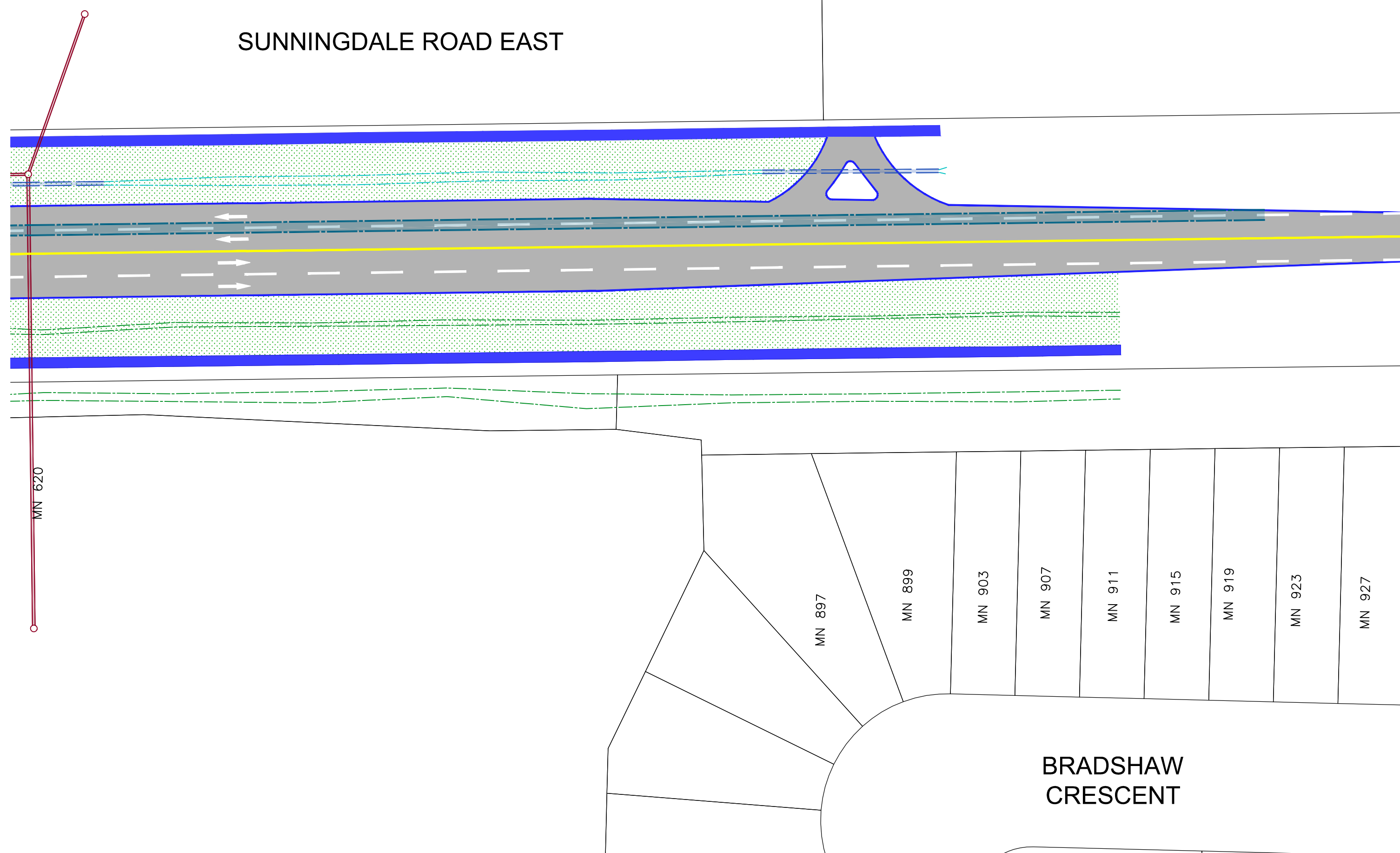
SUNNINGDALE ROAD STA 1+460 TO STA 1+860

PROJECT No.	-----
PLATE No.	7

COMMUNITY CENTRE

MN 927

SUNNINGDALE ROAD EAST

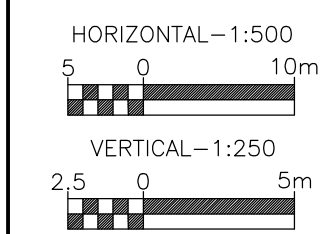


Job No. ----- DWG No.8 J:\DATA\476793 - Adelaide St. North\6E_Dwg\NewConst. - EA\476793-Plan and Profile.dwg

STATION



- LEGEND
- PROPERTY LINE
 - PROPOSED RIGHT-OF-WAY
 - EXISTING GROUND PROFILE
 - FUTURE ROAD PROFILE
 - PROPERTY REQUIRED FOR ADDITIONAL RIGHT OF WAY
 - EXISTING SIDEWALK
 - EXISTING CYCLE TRACK
 - PROPOSED ROAD
 - PROPOSED BICYCLE LANE
 - PROPOSED SIDEWALK
 - PROPOSED CYCLE TRACK



ADELAIDE STREET NORTH
FANSHAW PARK ROAD TO SUNNINGDALE

RECOMMENDED ALTERNATIVE

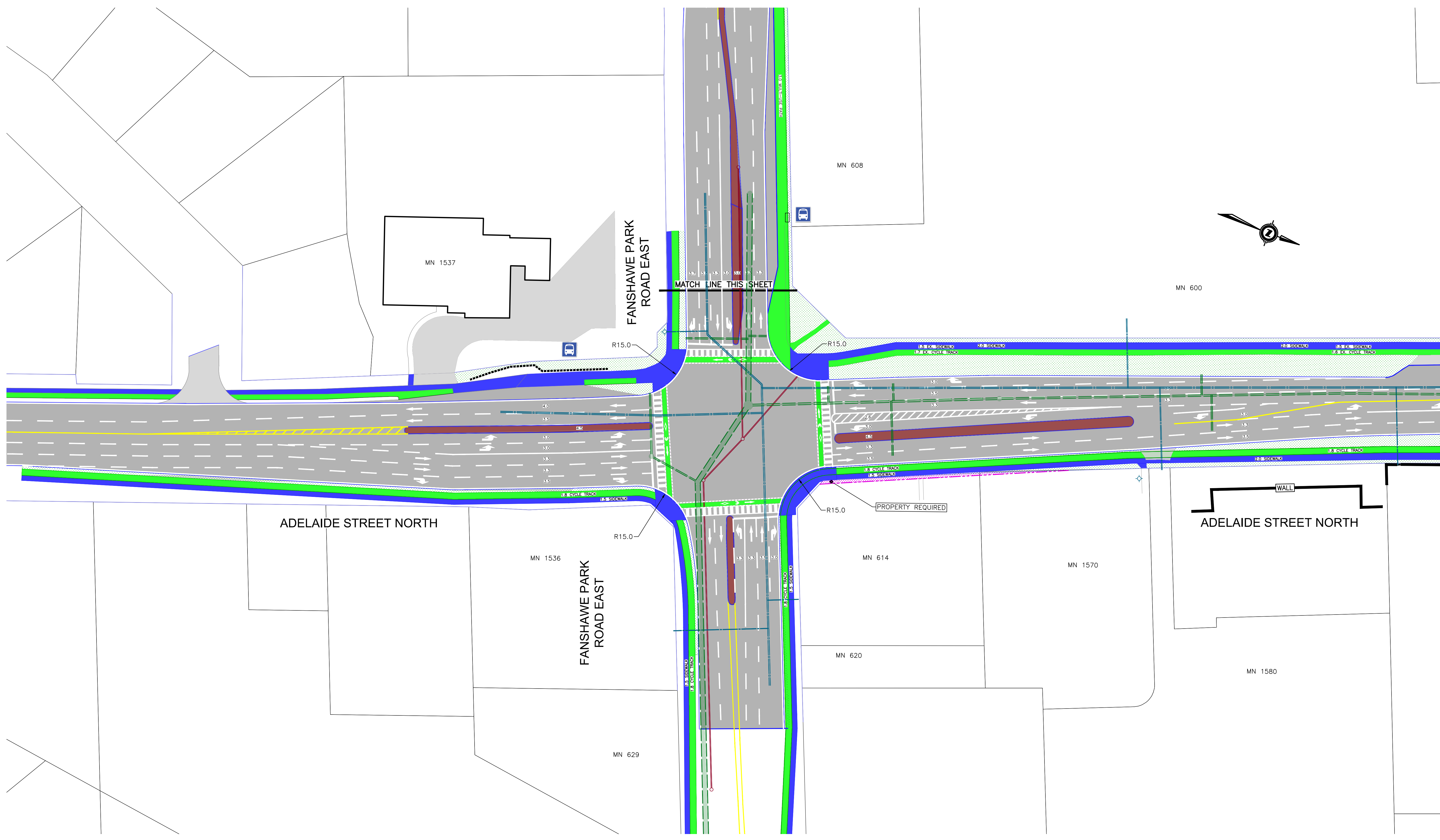
SUNNINGDALE ROAD STA 1+860 TO STA 2+005

PROJECT No.	-----
PLATE No.	8

STATION

STORM SEWER INVERT

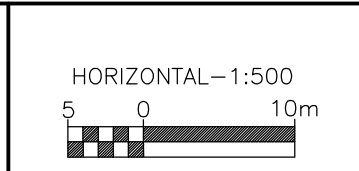
Job No. ----- DWG No. A J:\DATA\476783 - Adelaide St. North\661_Dwg\NewConst - EA\476783-Plan and Profile.dwg



LEGEND

	PROPERTY LINE		EXISTING SIDEWALK
	PROPOSED RIGHT-OF-WAY		EXISTING CYCLE TRACK
	EXISTING GROUND PROFILE		PROPOSED ROAD
	FUTURE ROAD PROFILE		PROPOSED BICYCLE LANE
	PROPERTY REQUIRED FOR ADDITIONAL RIGHT OF WAY		PROPOSED SIDEWALK
			PROPOSED CYCLE TRACK

	EXISTING SIDEWALK
	EXISTING CYCLE TRACK
	PROPOSED ROAD
	PROPOSED BICYCLE LANE
	PROPOSED SIDEWALK
	PROPOSED CYCLE TRACK

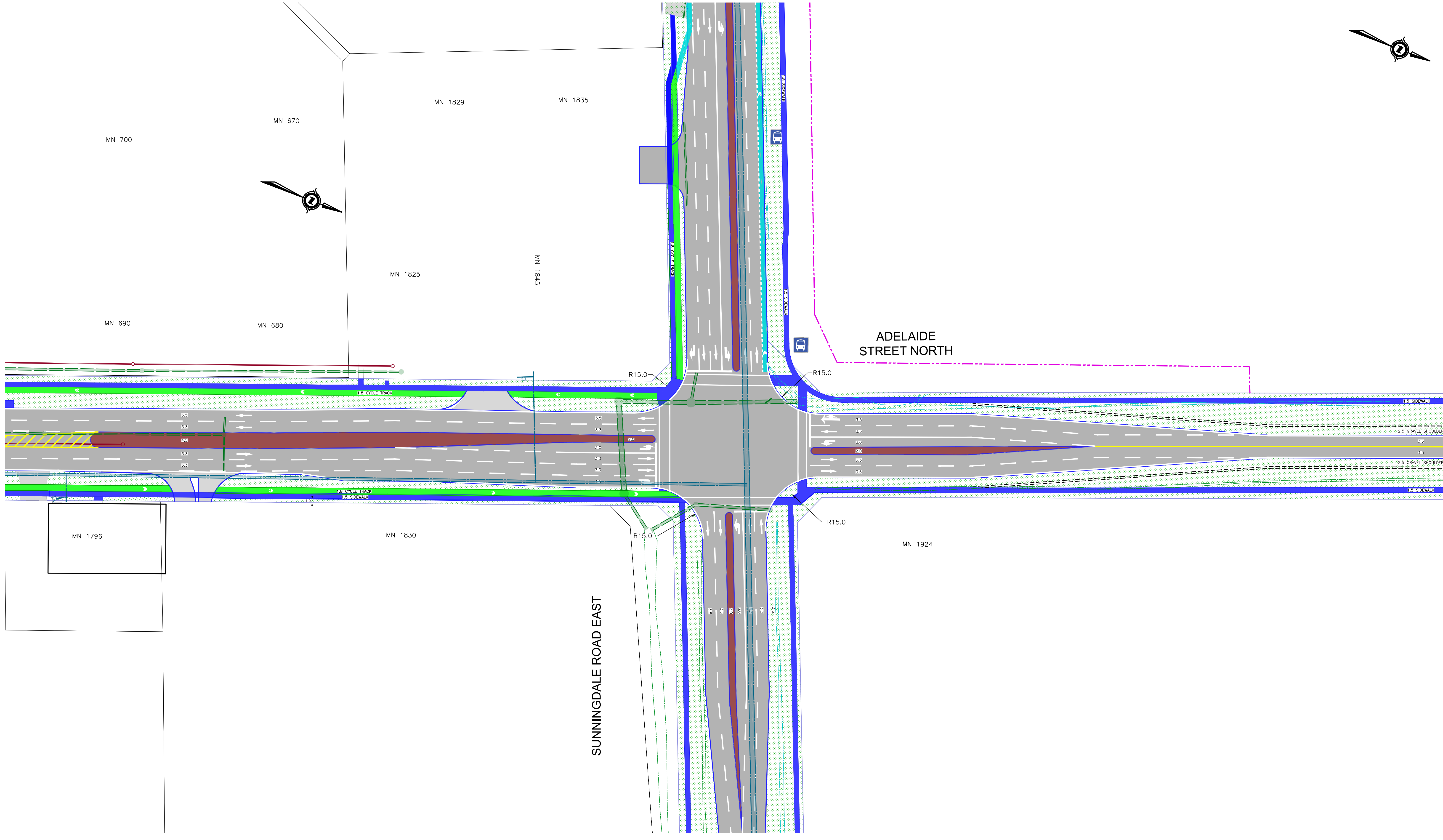
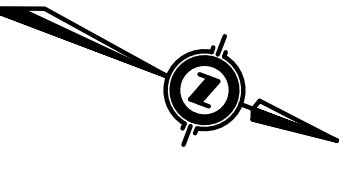


ADELAIDE STREET NORTH
FANSHAWE PARK ROAD TO SUNNINGDALE

RECOMMENDED ALTERNATIVE

ADELAIDE INTERSECTION

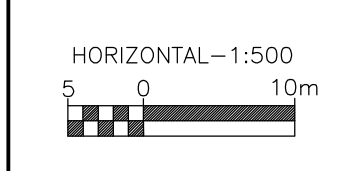
PROJECT No.	-----
PLATE No.	A



Job No. ----- DWG No.B J:\DATA\476793 - Adelaide St. North\6E_Dwg\NewConst - EA\476793-Plan and Profile.dwg



LEGEND	
	PROPERTY LINE
	PROPOSED RIGHT-OF-WAY
	EXISTING GROUND PROFILE
	FUTURE ROAD PROFILE
	PROPERTY REQUIRED FOR ADDITIONAL RIGHT OF WAY
	EXISTING SIDEWALK
	EXISTING CYCLE TRACK
	PROPOSED ROAD
	PROPOSED BICYCLE LANE
	PROPOSED SIDEWALK
	PROPOSED CYCLE TRACK



ADELAIDE STREET NORTH
FANSHAWE PARK ROAD TO SUNNINGDALE

RECOMMENDED ALTERNATIVE

SUNNINGDALE INTERSECTION

PROJECT No.	-----
PLATE No.	B

Appendix D

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purposes

Filename: Adelaide.te Time Period: 1 hours
 Description: Adelaide Receptor 6

Road data, segment # 1: Adelaide NB

```
-----
Car traffic volume : 653 veh/TimePeriod
Medium truck volume : 9 veh/TimePeriod
Heavy truck volume : 9 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 1: Adelaide NB

```
-----
Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 25.40 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Road data, segment # 2: Adelaide SB

```
-----
Car traffic volume : 741 veh/TimePeriod
Medium truck volume : 11 veh/TimePeriod
Heavy truck volume : 11 veh/TimePeriod
Posted speed limit : 60 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)
```

Data for Segment # 2: Adelaide SB

```
-----
Angle1 Angle2 : -90.00 deg 90.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 30.60 m
Receiver height : 1.50 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00
```

Results segment # 1: Adelaide NB

```
-----
Source height = 1.08 m

ROAD (0.00 + 59.92 + 0.00) = 59.92 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
-90 90 0.66 65.17 0.00 -3.80 -1.46 0.00 0.00 0.00 59.92
-----
```

Segment Leq : 59.92 dBA

Results segment # 2: Adelaide SB

```
-----
Source height = 1.10 m

ROAD (0.00 + 59.28 + 0.00) = 59.28 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq
-----
-90 90 0.66 65.88 0.00 -5.14 -1.46 0.00 0.00 0.00 59.28
-----
```

Segment Leq : 59.28 dBA

Total Leq All Segments: 62.62 dBA

TOTAL Leq FROM ALL SOURCES: 62.62

ORNAMENT - Sound Power Emissions & Source Heights

Ontario Road Noise Analysis Method for Environment and Transportation

Road Segment ID	Roadway Name	Link Description	Speed (km/h) used	Period (h)	AM Peak hour	PM Peak hour	Average Peak	2039 AADT	Split	Traffic for Period	Auto %	% Trucks	Med %	Hvy %	Auto	Med	Heavy	Road Gradient (%)	Cadna/A Ground Absorption G	PWL (dBA)	Source Height, s (m)
Adelaide St. North	South of Fanshaw Park Rd. East, NB	Daytime Impacts	60	16	1,050	2,199	1,625	16,245	90%	14,621	96.9%	3.1%	1.5%	1.5%	14,174	223	223	0	0.00	81.8	1.1
Adelaide St. North	Fanshaw Park Rd. East to Grenfell Dr., NB	Daytime Impacts	60	16	799	2,112	1,455	14,550	90%	13,095	97.3%	2.7%	1.4%	1.4%	12,739	178	178	0	0.00	81.1	1.1
Adelaide St. North	Grenfell Dr. to Blackwater Rd., NB	Daytime Impacts	60	16	719	1,667	1,193	11,925	90%	10,733	97.4%	2.6%	1.3%	1.3%	10,456	138	138	0	0.00	80.2	1.1
Adelaide St. North	Blackwater Rd. to Sunnidale Rd. East, NB	Daytime Impacts	60	16	789	1,532	1,160	11,603	90%	10,442	98.0%	2.0%	1.0%	1.0%	10,233	105	105	0	0.00	79.6	1.0
Adelaide St. North	North of Sunningdale Rd. East, NB	Daytime Impacts	60	16	491	738	615	6,145	90%	5,531	98.2%	1.8%	0.9%	0.9%	5,431	50	50	0	0.00	76.7	1.0
Adelaide St. North	North of Sunningdale Rd. East, NB, North of 60 km/h Zone	Daytime Impacts	80	16	471	471	471	4,710	90%	4,239	98.2%	1.8%	0.9%	0.9%	4,163	38	38	0	0.00	78.6	1.0
Adelaide St. North	North of Sunningdale Rd. East, SB, North of 60 km/h Zone	Daytime Impacts	80	16	503	347	425	4,250	90%	3,825	98.1%	1.9%	1.0%	1.0%	3,752	36	36	0	0.00	78.2	1.0
Adelaide St. North	North of Sunningdale Rd. East, SB	Daytime Impacts	60	16	708	666	687	6,870	90%	6,183	98.1%	1.9%	1.0%	1.0%	6,065	59	59	0	0.00	77.2	1.0
Adelaide St. North	Sunningdale Rd. East to Blackwater Rd., SB	Daytime Impacts	60	16	1,180	1,260	1,220	12,200	90%	10,980	98.0%	2.0%	1.0%	1.0%	10,756	112	112	0	0.00	79.9	1.0
Adelaide St. North	Blackwater Rd. to Phillbrooke Dr., SB	Daytime Impacts	60	16	1,233	1,480	1,356	13,560	90%	12,204	97.2%	2.8%	1.4%	1.4%	11,857	173	173	0	0.00	80.9	1.1
Adelaide St. North	Phillbrooke Dr. to Fanshawe Park Rd. East, SB	Daytime Impacts	60	16	1,455	2,016	1,736	17,355	90%	15,620	98.0%	2.0%	1.0%	1.0%	15,304	158	158	0	0.00	81.4	1.0
Adelaide St. North	South of Fanshaw Park Rd. East, SB	Daytime Impacts	60	16	1,450	2,125	1,788	17,875	90%	16,088	97.4%	2.6%	1.3%	1.3%	15,676	206	206	0	0.00	81.9	1.1
Fanshaw Park Rd. East	West of Adelaide St. North, EB	Daytime Impacts	60	16	1,604	1,827	1,716	17,155	90%	15,440	96.6%	3.4%	1.7%	1.7%	14,922	259	259	0	0.00	82.3	1.1
Fanshaw Park Rd. East	East of Adelaide St. North, EB	Daytime Impacts	60	16	1,245	1,631	1,438	14,380	90%	12,942	97.2%	2.8%	1.4%	1.4%	12,581	181	181	0	0.00	81.1	1.1
Fanshaw Park Rd. East	East of Adelaide St. North, WB	Daytime Impacts	60	16	1,589	1,015	1,302	13,020	90%	11,718	97.7%	2.3%	1.2%	1.2%	11,444	137	137	0	0.00	80.4	1.0
Fanshaw Park Rd. East	West of Adelaide St. North, WB	Daytime Impacts	60	16	1,997	1,369	1,683	16,830	90%	15,147	97.1%	2.9%	1.5%	1.5%	14,707	220	220	0	0.00	81.9	1.1
Sunningdale Rd. East	West of Adelaide St. North, EB	Daytime Impacts	60	16	1,182	1,487	1,334	13,340	90%	12,006	96.7%	3.3%	1.6%	1.6%	11,613	196	196	0	0.00	81.1	1.1
Sunningdale Rd. East	East of Adelaide St. North, EB	Daytime Impacts	60	16	1,107	1,311	1,209	12,088	90%	10,879	96.2%	3.8%	1.9%	1.9%	10,464	207	207	0	0.00	81.1	1.2
Sunningdale Rd. East	East of Adelaide St. North, WB	Daytime Impacts	60	16	1,282	876	1,079	10,785	90%	9,707	96.4%	3.6%	1.8%	1.8%	9,357	175	175	0	0.00	80.4	1.2
Sunningdale Rd. East	West of Adelaide St. North, WB	Daytime Impacts	60	16	1,560	974	1,267	12,665	90%	11,399	96.4%	3.6%	1.8%	1.8%	10,986	206	206	0	0.00	81.1	1.2
Blackwater Rd.	West of Adelaide St. North, WB	Daytime Impacts	50	16	92	38	65	1,130	90%	1,017	95.1%	4.9%	2.4%	2.4%	968	25	25	0	0.00	69.7	1.2
Blackwater Rd.	West of Adelaide St. North, EB	Daytime Impacts	50	16	67	69	68	805	90%	725	93.6%	6.4%	3.2%	3.2%	678	23	23	0	0.00	69.1	1.3
Blackwater Rd.	East of Adelaide St. North, EB	Daytime Impacts	50	16	215	94	155	1,545	90%	1,391	97.6%	2.4%	1.2%	1.2%	1,357	17	17	0	0.00	69.4	1.1
Blackwater Rd.	East of Adelaide St. North, WB	Daytime Impacts	50	16	111	204	158	1,575	90%	1,418	98.0%	2.0%	1.0%	1.0%	1,389	14	14	0	0.00	69.1	1.0
Blackwater Rd.	South of Sunnidale Rd. East, SB	Daytime Impacts	50	16	103	83	93	805	90%	725	97.6%	2.4%	1.2%	1.2%	707	9	9	0	0.00	66.6	1.1
Blackwater Rd.	South of Sunnidale Rd. East, NB	Daytime Impacts	50	16	99	223	161	1,130	90%	1,017	98.0%	2.0%	1.0%	1.0%	996	10	10	0	0.00	67.7	1.0
Phillbrooke Dr.	West of Adelaide St. North, WB	Daytime Impacts	50	16	247	124	186	1,855	90%	1,670	95.6%	4.4%	2.2%	2.2%	1,596	37	37	0	0.00	71.6	1.2
Phillbrooke Dr.	West of Adelaide St. North, EB	Daytime Impacts	50	16	201	281	241	2,410	90%	2,169	97.6%	2.4%	1.2%	1.2%	2,118	26	26	0	0.00	71.2	1.0
Grenfell Dr.	East of Adelaide St. North, EB	Daytime Impacts	50	16	411	170	291	2,905	90%	2,615	97.4%	2.6%	1.3%	1.3%	2,546	34	34	0	0.00	72.3	1.1
Grenfell Dr.	East of Adelaide St. North, WB	Daytime Impacts	50	16	264	372	318	3,180	90%	2,862	97.4%	2.6%	1.3%	1.3%	2,788	37	37	0	0.00	72.6	1.1

Appendix E

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for 2-sided printing purposes

Sound By-law

PW-12 – Consolidated March 7, 2019

As Amended By

By-law No.	Date Passed at Council
PW-12-11001	July 25, 2011
PW-12-17002	June 13, 2017
PW-12-18003	July 24, 2018
PW-12-19004	March 5, 2019

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London
CANADA

**OFFICE CONSOLIDATION
INCLUDING AMENDMENT PW-12-18004 (March 5, 2019)**

Bill No. 217
2009

By-law No. PW-12

A by-law to provide for the Regulation and
Prohibition of Noise and Sound.

WHEREAS section 9 of the *Municipal Act, 2001*, S.O. 2001, c. 25, as amended, provides that a municipality has the capacity, rights, powers and privileges of a natural person for the purpose of exercising its authority under this or any other Act;

AND WHEREAS subsection 10(1) of the *Municipal Act, 2001* provides that a municipality may provide any service or thing that the municipality considers necessary or desirable for the public;

AND WHEREAS subsection 10(2) of the *Municipal Act, 2001* provides that a municipality may pass by-laws respecting: in paragraph 5, Economic, social and environmental well-being of the municipality; in paragraph 6, Health, safety and well-being of persons; in paragraph 7, Services and things that the municipality is authorized to provide under subsection (1); in paragraph 8, Protection of persons and property; in paragraph 9, Animals; in paragraph 9, Structures including fences and signs;

AND WHEREAS section 129 of the *Municipal Act, 2001* provides that, without limiting sections 9 and 10 of the Act, a municipality may: (a) prohibit and regulate with respect to noise, vibration, odour, dust and outdoor illumination, including indoor lighting that can be seen outdoors; and (b) prohibit the matters described in clause (a) unless a permit is obtained from the municipality for those matters and may impose conditions for obtaining, continuing to hold and renewing the permit, including requiring the submission of plans;

AND WHEREAS section 128 of the *Municipal Act, 2001* provides that a municipality may prohibit and regulate with respect to public nuisances, including matters that, in the opinion of Council are or could become public nuisances;

AND WHEREAS in the opinion of Council for the City of London, certain kinds of noise are or could become a public nuisance;

AND WHEREAS subsection 391(1) of the *Municipal Act, 2001* provides that a municipality may impose fees and charges on persons,

- (a) for services or activities provided or done by or on behalf of it;
- (b) for costs payable by it for services or activities provided or done by or on behalf of any other municipality or any local board; and,
- (c) for the use of its property including property under its control;

AND WHEREAS Section 23.2 of the *Municipal Act, 2001* permits a municipality to delegate certain legislative and quasi-judicial powers;

AND WHEREAS section 444 of the *Municipal Act, 2001* provides that the municipality may make an order requiring the person who contravened the by-law or who caused or permitted the contravention or the owner or occupier of the land on which the contravention occurred to discontinue the contravening activity, and any person who contravenes such an order is guilty of an offence;

AND WHEREAS section 447.8 of the *Municipal Act, 2001* provides that a by-law of a municipality made under this or any other Act may,

- (a) adopt by reference, in whole or in part, with such changes as the council considers appropriate, any code, standard, procedure or regulation as it stands at a specific date, as it stands at the time of adoption or as amended from time to time; and
- (b) require compliance with any code, standard, procedure or regulation so adopted;

AND WHEREAS section 195 of the *Highway Traffic Act*, R.S.O. 1990, c. H.8 provides in section 195 that “If a provision of a municipal by-law passed by the council of a municipality...for regulating noise...created by the operation of motor vehicles on the highways...is inconsistent with this Act or the regulations, the provision of the by-law shall be deemed to be repealed upon the inconsistency arising”;

AND WHEREAS section 179 of the *Environmental Protection Act*, R.S.O. 1990, c. E.19 provides in section 179 “Where a conflict appears between any provisions of this Act or the regulations and any other Act or regulation in a matter related to the natural environment or a matter specifically dealt with in this Act or the regulations, the provision of this Act or the regulations shall prevail”;

THEREFORE the Municipal Council of The Corporation of the City of London enacts as follows:

PART 1

DEFINITIONS

1.1 For the purpose of this by-law:

“Agricultural Operation” has the same meaning as contained in the *Farming and Food Production Protection Act*, 1998, S.O. 1998, C. 1, as amended, or any successor legislation;

“Amplified Live Speech” means live speech amplified by any means that is clearly audible at an outdoor public place, but does not include live speech that is incidental to a commercial, industrial, or institutional premise, and does not include live speech amplified by an assistive device used by a person due to a disability;

“Animal” means any member of the animal kingdom, other than a human, and without limiting the generality of the foregoing, includes dogs, cats, and birds;

“City” means The Corporation of the City of London;

“Community Event (Class 1)” means: the Western Fair Association’s annual week-long Western Fair held at the Western Fairgrounds; the annual week-long orientation events and campus life events that are held on campus at the University of Western Ontario and affiliated colleges; and the annual week-long orientation events and campus life events that are held on campus at Fanshawe College;

“Community Event (Class 2)” means: an event open to the public, including a public fair, public exhibition, public celebration, public sporting event, public concert; or a university or college event; or a school board event. A Community Event (Class 2) does not include a Special Event or a Community Event (Class 1);

“Construction” includes erection, alteration, repair, dismantling, demolition, structural maintenance, painting, moving, land clearing, earth moving, grading, excavating, the laying of pipe and conduit whether above or below ground level, street and highway building, concreting, equipment installation and alteration and the structural installation of construction components and materials in any form for any purpose, and includes any work in connection therewith;

“Conveyance” includes a vehicle and any other device employed to transport a person or persons or goods from place to place but does not include any such device or vehicle if operated only within the premises of a person;

“Council” means the Council for the City;

“Hearings Officer” means a Hearings Officer appointed under the City’s Hearings Officer By-law A.-6653-121, as amended;

“Manager of By-law Enforcement” means the Manager of By-law Enforcement for the City, or his or her designate;

“Municipality” means the land within the geographic limit of the City of London;

“Normal Farm Practice” has the same meaning as contained in the *Farming and Food Production Protection Act, 1998*, S.O. 1998, C. 1, as amended, or any successor legislation;

“Point of Reception” means any point on the premises where sound originating from other than those premises is received;

“Residential Area” means any area of the Municipality where residential use is permitted under the provisions of the City’s Zoning By-law from time to time, including but not limited to land zoned R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, or R11;

“Rural Area” means land in the Municipality zoned AG, AGC, or UR from time to time under the City’s Zoning By-law;

“Special Event” means a Special Event as defined in the City’s Special Events Policies and Procedures Manual, and that is recognized by the City as a special event;

“Stationary Source” means a source of sound which does not normally move from place to place, and includes the premises of a person as one stationary source unless the dominant source of sound on those premises is Construction or a Conveyance;

1.2 Any word or term not defined in this By-law, that is defined in the Ontario Ministry of the Environment Publication Noise Pollution Control NPC-101, 102, 103, 104, 115, 205, 206, 215 or 232 (as set out in Part 3 of this By-law) shall have the meaning ascribed to it in such NPC Publication.

PART 2 – QUALITATIVE NOISE PROHIBITIONS

General Prohibition

2.1 No person shall make, cause or permit an unreasonable noise, or a noise that is likely to disturb the inhabitants.

Prohibitions - deemed

2.2 Without limiting the generality of section 2.1 of this By-law, the provisions of sections 2.3 through 2.4 shall be deemed to be unreasonable noise, or noise that is likely to disturb the inhabitants.

Prohibitions – deemed - any time, any location

2.3 At any time or location in the Municipality:

Vehicle - Warning Device - Unreasonable Period

(a) the sounding of any bell, horn, siren or other warning device on any motor vehicle or vehicle for an unnecessary or unreasonable period of time, except when permitted by law;

Vehicle - Disrepair - Maladjustment

- (b) the grating, grinding or rattling sound caused by the condition of disrepair or maladjustment of any motor vehicle or vehicle or part or accessory thereof;

Vehicle – Load – Improperly Secured

- (c) the sound created by the operation of any motor vehicle, trailer or other vehicle bearing material, articles or things that are loaded upon such vehicle in such manner as to create excessive noise;

Vehicle - Exhaust- except through muffling device

- (d) the sound from the discharge into the open air of the exhaust of any steam engine, internal combustion engine (including the engine of any motor vehicle), or pneumatic device without an effective exhaust or intake muffling device in good working order and in constant operation that prevents excessive noises that are loud or explosive;

Vehicle - Speakers

- (e) the sound from or created by any radio, amplifier, loud speaker, public address system, or equipment, device or instrument that emits sound when the same is used or operated from any motor vehicle, trailer or vehicle that is clearly audible at least 8 metres (25 feet) from the vehicle;

Attracting attention – to Performance – Advertising

- (f) the sound from or created by any instrument, radio, amplification device, loud speaker, public address system, equipment or device that emits sound when the same is used or operated for the purpose of advertising or for attracting attention to any performance or sale, show or display of goods or services and projects such sound into any street or other public place;

Whistle – attached to boiler – other mechanism

- (g) the sound from any steam whistle or air whistle attached to or used in connection with a boiler or other machine or mechanism, except for the purpose of giving notice of the time to commence or cease work, or as a warning of danger;

Alarm – Warning Device

- (h) the sounding of any alarm, bell, horn, siren or other warning device for an unnecessary or unreasonable period of time.

Prohibitions – deemed - Residential Area

- 2.4 At the specified times and clearly audible at a Point of Reception in a Residential Area:

Animal – any time

- (a) the persistent sound by any Animal under the care, control or ownership of the person that is clearly audible at a Point of Reception in a Residential Area at any time;

Amplified Sound – television – stereo – speakers – amplifiers – any time

- (b) the sound created by any electronic device or group of connected electronic devices incorporating one or more loudspeakers or other electro-mechanical transducers intended for the production, reproduction or amplification of sound, including but not limited to a radio, television, amplifier, loud speaker, public address system, sound equipment, that is clearly audible at a Point of Reception in a Residential Area at any time;

Shouting, Yelling, Loud Hooting, Loud Whistling, Loud Singing – any time

- (c) any shouting, yelling, loud hooting, loud whistling or loud singing that is clearly audible at a Point of Reception in a Residential Area at any time;

Construction – Excavation – 6 p.m. to 7 a.m.

- (d) the noise arising from Construction that is clearly audible at a Point of

Reception in a Residential Area between 6:00 p.m. and 7:00 a.m. of the following day (or 9:00 a.m. if the following day is Sunday);

Firearms – discharge – 9 p.m. to 7 a.m.

- (e) the sound caused by the discharge of any gun or other firearm, air gun, spring-gun of any class or type that is clearly audible at a Point of Reception in a Residential Area between 9:00 p.m. and 7:00 a.m. of the following day (or 9:00 a.m. if the following day is Sunday), except if lawfully discharged by a peace officer in the performance of their duties;

Power Equipment – use – 10 p.m. to 7 a.m.

- (f) the sound caused by the use or operation of a lawnmower, chain-saw, leaf-blower, or any other such noise-generating tool or device that is clearly audible at a Point of Reception in a Residential Area between 10:00 p.m. of any day and 7:00 a.m. of the next following day (or 9:00 a.m. if the following day is Sunday).

PART 3 – QUANTITATIVE NOISE – STATIONARY SOURCES

ADOPTION OF STANDARDS AND PROCEDURES

- 3.1 The following Ontario Ministry of Environment Publications (NPC – Noise Pollution Control) standards and procedures are adopted and incorporated by reference into this by-law:

- NPC 101 - Technical Definitions, as set out in the Ministry of the Environment's "Model Municipal Noise Control By-law, Final Report, August 1978";
- NPC 102 - Instrumentation, as set out in the Ministry of the Environment's "Model Municipal Noise Control By-law, Final Report, August 1978";
- NPC 103 - Procedures, as set out in the Ministry of the Environment's "Model Municipal Noise Control By-law, Final Report, August 1978";
- NPC 104 - Sound Level Adjustments, as set out in the Ministry of the Environment's "Model Municipal Noise Control By-law, Final Report, August 1978";
- NPC 115 - Construction Equipment, as set out in the Ministry of the Environment's "Model Municipal Noise Control By-law, Final Report, August 1978";
- NPC 205 - Sound Level Limits for Stationary Sources in Class 1 & 2 Areas (Urban), dated October 1995;
- NPC 206 - Sound Levels Due to Road Traffic, dated October 1995;
- NPC 216 - Residential Air Conditioning Devices, dated October 1993;
- NPC 232 - Sound Level Limits for Stationary Sources in Class 3 Areas (Rural), dated October 1995

QUANTITATIVE NOISE PROHIBITIONS

- 3.2 No person shall emit or cause or permit the emission of sound from a Stationary Source such that the level of sound from that source at the Point of Reception:
- (a) in a Residential Area exceeds the applicable sound level limit prescribed in publication NPC-205– Sound Level Limits for Stationary Sources in Class 1 & 2 Areas (Urban), dated October 1995; or
 - (b) in a Rural Area exceeds the applicable sound level limit prescribed in publication NPC-232 – Sound Level Limits for Stationary Sources in Class 3 Areas (Rural), dated October 1995; or
 - (c) in a Residential Area exceeds the applicable sound level limit prescribed in publication NPC-216 – Residential Air Conditioning Devices, dated October 1993.

- 3.3 Where a source of sound is subject to more than one subsection in section 3.2, the least restrictive provision shall prevail.

PART 4 – TEMPORARY NOISE PERMIT - CONSTRUCTION – COMMUNITY EVENT (CLASS 2) AMPLIFIED LIVE SPEECH

Application for a Temporary Noise Permit

- 4.1(1) Any person may submit an application for a temporary noise permit for Construction or for a Community Event (Class 2) or Amplified Live Speech.
- (2) The application in subsection (1) shall be made in writing to the Manager of By-law Enforcement, and shall contain all of the following:
- (a) the name and address of the applicant;
 - (b) a description of the event and how it meets the definition of Community Event (Class 2) or Construction or Amplified Live Speech”;
 - (c) the location of the event or activity for which the temporary noise permit is sought;
 - (d) a description of the source of sound and level of sound for which the temporary noise permit is sought;
 - (e) the times of day, and the period of time (not in excess of six months) for which the temporary noise permit is sought;
 - (f) the reasons why the temporary noise permit should be granted;
 - (g) a statement of the steps, if any, planned or presently being taken to minimize the noise or sound;
 - (h) a non-refundable application fee of \$75.00;
 - (i) a temporary noise permit fee of \$100.00, refundable if the application is not approved;
 - (j) despite subsections (h) and (i) of subsection (2), there shall be no fees associated with a permit for Amplified Live Speech.
- (3) The following power and authority is delegated to the Manager of By-law Enforcement with respect to Construction or a Community Event (Class 2) or Amplified Live Speech:
- (a) to issue a temporary noise permit; and
 - (b) to refuse to issue, cancel, revoke or suspend a temporary noise permit, and to impose conditions (including special conditions) on a temporary noise permit.
- (4) In making his or her determination under subsection (3), the Manager of By-law Enforcement shall:
- (i) determine whether the event falls within the definition of Construction or Community Event (Class 2) or Amplified Live Speech;
 - (ii) consider any negative effects the issuance of the temporary noise permit may have on neighbouring properties or on the City;
 - (iii) consider any benefits the issuance of the temporary noise permit may have for neighbouring properties or for the City;
 - (iv) consider any previous violations of this By-law or temporary noise permit conditions by the applicant; and
 - (v) consider anything the Manager of By-law Enforcement reasonably considers relevant.
- (5) (a) The Manager of By-law Enforcement may impose conditions on a temporary noise permit, including but not limited to:
- (i) the type and volume of sounds that may be made;
 - (ii) the times during which sounds may be made;
 - (ii) the date of expiry of the temporary noise permit (not in excess of twelve months);
 - (iv) requiring the posting of security prior to the activity; and
 - (v) that the applicant, City staff or a professional engineer monitor the sound

levels resulting from the event or activity and require a report of the findings of the engineer be filed with the Manager of By-law Enforcement within 30 days of the event or activity, all at the applicant's expense.

(b) The Manager of By-law Enforcement shall impose conditions on a temporary noise permit for Community Event (Class 2) or Amplified Live Speech with respect to:

- (i) the volume of amplified sound that may be made; and
- (ii) the times during which sounds may be made.

(c) The minimum conditions that the Manager of By-law Enforcement shall impose under subsection 5(b) are:

- (i) subject to subsection (ii), the volume of amplified sound that may be made shall not exceed a sound pressure of at most 90 decibels at a point of reception determined by the Manager of By-law Enforcement;
- (ii) the volume of amplified sound that may be made from an outdoor patio shall not exceed a sound pressure of at most 70 decibels at a point of reception determined by the Manager of By-law Enforcement; and
- (iii) the times during which sound may be made shall be limited to the hours of 9:00 a.m. at the earliest and 12:00 midnight at the latest.
- (iv) For the dates of March 14, 15, 16, 17, 2019, the times during which the volume of amplified sound that may be made from an outdoor patio is 1:00 a.m. at the latest.

(6) Where the Manager of By-law Enforcement has made a decision under subsection (3)(b), he or she shall give written notice of that decision to the applicant by regular mail to the last known address of that person. The written notice shall:

- (a) set out the grounds for the decision;
- (b) give reasonable particulars of the grounds;
- (c) be signed by the Manager of By-law Enforcement;
- (d) state that the applicant is entitled to a hearing by a Hearings Officer if the applicant files a notice of appeal with the City Clerk within 10 days after the notice is given, and pays the appeal fee of \$150.

(7) Where no appeal is received within 10 days after the notice is given, the decision of the Manager of By-law Enforcement shall be final.

(8) *deleted PW-12-19004*

Hearings

4.1(9) The power and authority to conduct hearings of appeals under the by-law are hereby delegated to the Hearings Officer. The provisions of the City's Hearings Officer By-law A.-6653-21, as amended apply to all hearings conducted by a Hearings Officer.

4.1(10) A request by the applicant for a hearing shall be made in writing and filed with the City Clerk. The request shall consist of a notice of appeal and must comply with the requirements as set out in Schedule 1 of the City's Hearings Officer By-law A.-6653-121, as amended.

4.1(11) Subsection 4.1(4) and 4.1(5) of this by-law apply with necessary modifications to a Hearings Officer. A Hearings Officer may direct the Manager of By-law Enforcement to issue the temporary noise permit (including imposing any conditions), or refuse to issue a temporary noise permit.

4.1(12) The decision of the Hearings Officer shall be final.

Temporary Noise Permit Expiry

- 4.2 Any temporary noise permit issued under this By-law shall expire on the date set out on the temporary noise permit, or if no date is set out on the temporary noise permit, forty-eight hours after its issuance.

Breach of Terms or Conditions

- 4.3 Breach by the holder of the temporary noise permit of any of its terms or conditions shall render the temporary noise permit null and void.

Offence – Fail to Comply with Terms and Conditions

- 4.4 No holder of a temporary noise permit shall fail to comply with the terms and conditions of the temporary noise permit.

PART 5 – ENFORCEMENT

ORDERS

Order to Discontinue Activity

- 5.1 If a municipal law enforcement officer or a London Police Service police officer is satisfied that this by-law has been contravened, the officer may make an order, known as an Order to Discontinue Activity, requiring the person who contravened the by-law, or who caused or permitted the contravention, or the owner or occupier of the land on which the contravention occurred, to discontinue the contravention.

Order to Discontinue Activity - particulars

- 5.2 An Order to Discontinue Activity shall set out:
- (a) the municipal address of the property on which the contravention occurred;
 - (b) the date of the contravention;
 - (c) the reasonable particulars of the contravention of the by-law; and
 - (d) the date by which there must be compliance with the order.

Order to Discontinue Activity - service

- 5.3 The Order to Discontinue Activity may be served personally on the person to whom it is directed or by regular mail to the last known address of that person, in which case it shall be deemed to have been given on the third day after it is mailed. Service on a corporation can be effected by registered mail to the corporate mailing address.

Contravention of Order

- 5.4 No person shall contravene an Order to Discontinue Activity.

Inspection Fee

- 5.5 (1) Where the municipal law enforcement officer determines that an activity producing noise or sound is not in compliance with this by-law or with an Order to Discontinue Activity, the fee or charge set out in the applicable Fees and Charges By-law for inspection may be imposed on the owner, person responsible for the noise or sound, or temporary noise permit holder.
- (2) The fees imposed constitute a debt of the person to the City. The City Treasurer may add fees to the tax roll and collect them in the same manner as municipal taxes on any property for which all the owners are responsible for paying the fees.

Hinder or Obstruct

- 5.6 No person shall hinder or obstruct, or attempt to hinder or obstruct, any person who is exercising a power or performing a duty under this By-law, including carrying out an inspection.

By-law Enforcement – London Police Service - enforce

5.7 This by-law may be enforced by a City municipal law enforcement officer or a London Police Service police officer.

PART 6 - EXEMPTIONS

6.1 Despite any provision of this By-law, this By-law shall not apply to the following sounds arising from:

Police – Fire Services – Ambulance

(a) a vehicle of the London Police Service, provincial or federal police, London Fire Services, or ambulance, while in performance of their duty;

Railway – Airport – operations

(b) any activity that is integral to the operation of any railway or airport within the legislative authority of Parliament;

Public Necessity - Emergency

(c) a matter of public necessity or public emergency;

City Equipment – City Snow Removal - Road Cleaning Equipment - etc

(d) the operation of machines and equipment by or on behalf of the City, including but not limited to snow removal equipment, road cleaning equipment, grass cutting or field maintenance equipment, tree and shrub pruning and mulching equipment, painting machines for crosswalks and highways;

Garbage & Recycling Collection / Disposal - City

(e) the collection or disposal of garbage, waste or recyclable material by or on behalf of the City;

Signalling Devices

(f) signalling devices utilized as traffic and pedestrian control devices at intersections and crosswalks;

City Construction Projects

(g) the operation of equipment in conjunction with City Construction projects, City general maintenance projects, and City emergency maintenance projects;

Fireworks – Pyrotechnics

(h) the discharge of consumer fireworks, display fireworks or pyrotechnic special effects fireworks if such discharge complies with the City's Fireworks By-law;

Bells – Clocks – Religious - City

(i) bells, chimes, carillons or clocks associated with religious or public buildings or uses;

Industrial Use in Industrial Zone

(j) activities from industrial uses located in lands zoned for industrial use if sound is in accordance with the terms and conditions of a valid Certificate of Approval, provisional Certificate of Approval or other approval issued under the *Environmental Protection Act*, R.S.O. 1990, c. E.19, where such approval addresses sound as a source of contamination;

Normal Farm Practice

(k) activities as part of a Normal Farm Practice and carried on as part of an Agricultural Operation;

Public Utilities

- (l) operation of machinery by or on behalf of a public utility where work needs to be done to minimize service interruptions;

Work Approval Permit - Streets By-law

- (m) operation of construction equipment where the City has issued a Work Approval Permit under the Streets By-law and in issuing such permit the City requires the work to be done to minimize traffic impacts;

Public election - gathering - authorized

- (n) the use in a reasonable manner of any apparatus or mechanism for the amplification of the human voice or of music in a public park or any other commodious space in connection with any public election meeting or other lawful gathering between 9:00 a.m. and 6:00 p.m.;

Special Event – compliance with Special Events Policy Manual

- (o) a Special Event but only if it is in compliance with the City's Special Events Policy and Procedures Manual;

Community Event (Class 1) – compliance with Community Event (Class 1) Policy

- (p) a Community Event (Class 1) but only if it is in compliance with the City's Community Event (Class 1) Noise Policy;

Temporary Noise Permit – Construction – Community Event (Class 2) - Amplified Live Speech

- (q) Construction or a Community Event (Class 2) or Amplified Live Speech, but only if a valid temporary noise permit has been issued, and only if the terms and conditions of the temporary noise permit are complied with;

Parade - band - authorized

- (r) a military or other band in a parade if the parade is operating under written permission of the City;

Tradesman - plying call - legitimacy - moderation

- (s) any newsboy, pedlar, hawker or petty tradesman plying his calling legitimately and moderately;

Snow Removal – Private Property

- (t) the use in a reasonable manner of vehicles and equipment when utilized for the clearing and the removal of snow from private property;

Animals – City – Police

- (u) an Animal under the care or control of the City, including but not limited to those located at Storybook Gardens, and animals under the care or control of London Police Service or provincial or federal police.

6.2 Despite any provision of this By-law, this By-law shall not apply where:

- (a) a sound is from a facility that has been designed, developed, built, operated and maintained in accordance with the terms and conditions of a valid Certificate of Approval, provisional Certificate of Approval or other approval issued under the *Environmental Protection Act*, R.S.O. 1990, c. E.19, where such approval addresses sound as a source of contamination; or
- (b) an order or permit has been issued under the *Environmental Protection Act* that addresses the sound as a source of contamination.

PART 7- PENALTY

- 7.1 (1) Any person who contravenes any provision of this By-law is guilty of an offence.
- (2) A director or officer of a corporation who knowingly concurs in the

contravention of this By-law is guilty of an offence.

- 7.2 Any person convicted under this By-law is liable:
- (a) upon a first conviction, to a minimum fine of \$175.00 and a maximum fine of \$5,000.00;
 - (b) upon a subsequent conviction, to a minimum fine of \$500.00 and a maximum fine of \$10,000.00.
- 7.3 Despite section 7.2, where the person convicted is a corporation, the corporation is liable,
- (a) upon a first conviction, to a minimum fine of \$175 and a maximum fine of not more than Ten Thousand Dollars (\$10,000.); and
 - (b) upon any subsequent conviction, to a minimum fine \$1000 and a maximum fine of not more than Twenty Five Thousand Dollars (\$25,000).
- 7.4 If this by-law is contravened and a conviction entered, in addition to any other remedy and to any penalty imposed by the by-law, the court in which the conviction has been entered and any court of competent jurisdiction thereafter may make an order prohibiting the continuation or repetition of the offence by the person convicted.

PART 8- MISCELLANEOUS

- 8.1 By-law PW-4 and any amendments thereto are hereby repealed.
- 8.2 This by-law may be referred to as the "Sound By-law".
- 8.3 This by-law shall come into force and effect on July 1, 2009.

PASSED in Open Council May 4, 2009.

Anne Marie DeCicco-Best
Mayor

Kevin Bain
City Clerk

First Reading – May 4, 2009
Second Reading – May 4, 2009
Third Reading – May 4, 2009