AECOM

Finch West Light Rail Transit Maintenance and Storage Facility

Environmental Project Report

Part 2 of 2 - Appendices

July 2015

METROLINX
An agency of the Government of Ontario
Une agence du gouvernement de l'Ontario

Appendix A

Consultation

A1. Stakeholder Mailing List

Aboriginal Communities

Contact Name	Contact Title	Agency Name	Street Address	Postal Code	Phone Number	Fax Number	**E-Mail Address**
Environmental Unit	Environmental and Natural Resources Lands and Trusts Services	Aboriginal Affairs and Northern Devlopment Canada	25 St. Clair Avenue East, 8th floor	Toronto, ON M4T 1M2			EACoordination_ON@inac-ainc.gc.ca
Ms. Allison Berman	Program Officer	Consultation and Accommodation Unit Aboriginal Affairs and Northern Development Canada	300 Sparks Street, Room 205	Ottawa, ON K1A 04A	613-943-5488		allison.berman@inac-ainc.gc.ca
Mr. Corwin Troje	Manager (Acting)	Consultation Unit Ministry of Aboriginal Affairs	160 Bloor Street East, 9th Floor	Toronto, ON M7A 2E6	416-325-4044	416-325-1066	corwin.troje@ontario.ca
		Consultation Unit Ministry of Aboriginal Affairs	160 Bloor Street East, 4th Floor	Toronto, ON M7A 2E6	416-326-4740		maa.ea.review@ontario.ca
Grand Chief Konrad Sioui	Grand Chief	Huron-Wendat First Nation	255 Place Chef Michel Laveau	Wendake, QC G0A 4V0			melanievincent21@yahoo.ca; tina.durand@cnhw.qc.ca
Chief James Marsden	Chief	Alderville First Nation	11696 2nd Line Road, P.O. Box 46	Alderville, ON K0K 2X0			jbmarsden@alderville.ca; sanderson@alderville.ca
Chief Roland Monague	Chief	Beausoleil First Nation	11 Ogemaa Miikaan	Christian Island, ON L0K 1C0			bfnchief@chimnissing.ca
Chief Donna Big Canoe	Chief	Chippewas of Georgina Island	RR2, Box-13	Sutton West, ON L0E 1R0			dbigcanoe@georginaisland.com
Chief Greg Cowie	Chief	Hiawatha First Nation	123 Paudash Street, RR2	Hiawatha, ON K9J 0E6			chiefcowie@hiawathafn.ca
Chief Kelly LaRocca	Chief	Mississaugas of Scugog Island First Nation	22521 Island Road	Port Perry, ON L9L 1B6			consultation@scugogfirstnation.com; klarocca@scugogfirstnation.com
Chief Sharon Stinson Henry	Chief	Chippewas of Mnjikaning (Rama)	5884 Rama Road, Suite 200	Rama, ON L0K 1T0			chief@ramafirstnation.ca
Chief Phyllis Williams	Chief	Curve Lake First Nation	22 Winookeeda Road	Cruve Lake, ON K0L 1R0			dutytoconsult@curvelakefn.ca
Mr. Aly N. Alibhai	Director of Lands, Resources and Consultation	Métis Nation of Ontario	75 Sherbourne Street, Suite 311	Toronto, ON M5A 2P9	416-977-9881		alya@metisnation.org

Ontario Government Agencies

Contact Name	Contact Title	Agency Name	Mailing Address		Phone Number	Fax Number	**E-Mail Address**
Ms. Kathleen Hedley	Director, Environmental Approvals Branch	Ministry of Environment and Climate Change	135 St. Clair Avenue West, 1st Floor	Toronto, ON M4V 1P5			kathleen.hedley@ontario.ca
Ms. Audrey Bennett	Director, Provincial Planning Policy Branch	Ministry of Municipal Affairs and Housing	777 Bay St, 14th Floor	Toronto, ON M5G 2E5	416-585-6072		Audrey.Bennett@ontario.ca
Ms. Louis Bitonti	Senior Planner, Community and Planning Development	Ministry of Municipal Affairs and Housing	777 Bay St, 2nd Floor	Toronto, ON M5G 2E5	416-585-6563		louis.bitonti@ontario.ca
Mr. Marinha Antunes	Air Quality Analyst	Ministry of Environment and Climate Change	5775 Yonge St. 9th Floor	Toronto, ON M2M 4J1	416-326-3526		marinha.antunes@ontario.ca
Mr. Gavin Battarino	Special Project Officer	Ministry of Environment and Climate Change	135 St. Clair Avenue West, 1st Floor	Toronto, ON M4V 1P5			gavin.battarino@ontario.ca
Ms. Laura Hatcher	Team Lead, Culture Services Unit	Ministry of Tourism, Culture, and Sport	401 Bay Street, Suite 1700	Toronto, ON M7A 0A7	416-314-3108		laura.e.hatcher@ontario.ca

Ms. Renée Bowler	Team Leader-Environmental Planning, Planning and Analysis Section	Ministry of Natural Resources, Strategic Coordination and Integration	300 Water Street, 5th floor, North Tower, P.O. Box 7000	Peterborough, ON K9J 4R5	705-755-5870	705-755-1971	renee.bowler@ontario.ca
Ms. Jackie Burkart	District Planner, Aurora District	Ministry of Natural Resources and Foresty	50 Bloomington Road West	Aurora, ON L0G 1R0	416-713-7368	905-713-7360	jackie.burkart@ontario.ca
Mr. David Sit	Manager, Central Municipal Services Office	Ministry of Municipal Affairs and Housing	777 Bay Street, 2nd Floor	Toronto, ON M5G 2E5	416-585-6583		david.sit@ontario.ca
Mr. Neil Coburn	Director, Tourism Policy and Research Branch	Ministry of Tourism, Culture, and Sport	900 Bay Street, 10th Floor	Toronto, ON M7A 2E1	416-325-6055	416-314-7341	neil.coburn@ontario.ca
Ms. Rosi Zirger	A/Heritage Planner, Cultural Services Unit, Central and Southeast	Ministry of Tourism, Culture, and Sport	401 Bay Street, 17th floor	Toronto, ON M7A 0A7	416-314-7159	416-314-7341	rosi.zirger@ontario.ca
Mr. Chris Schiller	Manager- Culture Services Unit	Ministry of Tourism, Culture, and Sport	401 Bay Street, 17th floor	Toronto, ON M7A 0A7	416-314-7144		chris.schiller@ontario.ca
Mr. Tony Ierullo	Senior Network Management Engineer/Officer	Hydro One Networks Inc.	483 Bay Street, 13th Floor, North Tower	Toronto, ON M5G 2P5	416-345-5213		Tony.Ierullo@HydroOne.com
Ms. Renée Afoom-Boateng, MES, MCIP, RPP	Senior Planner, Environmental Assessment	Toronto and Region Conservation Authority	5 Shoreham Drive	Downsview, Ontario M3N 1S4	416-661-6600 ext. 5714	416-661-6898	rafoom-boateng@trca.on.ca
Ms. Annette Maher	Planner I, Environmental Assessment	Toronto and Region Conservation Authority	5 Shoreham Drive	Downsview, Ontario M3N 1S4	416-661-6600 ext. 5798		amaher@trca.on.ca
Ms. Paula Brown	Resarch Analyst, Law Enforcement Planner	Ontario Provincial Police	777 Memorial Avenue, 2nd Floor	Orillia, ON L3V 7V3	705-329-6903	705-329-7596	paula.brown@opp.ca
Municipal Contacts							
Contact Name	Contact Title	Agency Name	Mailing Address		Phone Number	Fax Number	**E-Mail Address**
Dr. David McKeown	Medical Officer of Health	City of Toronto	277 Victoria Street, 5th Floor	Toronto, M5B 1W2	416-338-7820		dmckeown@toronto.ca
Elected Officials							
Contact Name	Contact Title	Agency Name	Mailing Address		Phone Number	Fax Number	**E-Mail Address**
Councillor Giorgio Mammoliti	City Councillor Ward 7	City of Toronto	3100 Weston Road, Room 216	Toronto, ON M9M 2S7	416-395-6401		councillor_mammoliti@toronto.ca
Councillor Anthony Perruzza	City Councillor Ward 8	City of Toronto	3470 Keele Street, Suite #3	Toronto, ON M3J 3M1	416-338-0696		councillor_perruzza@toronto.ca
Mario Sergio, MPP	Member of Provincial Parliament, York West	Ontario Liberal Party	2300 finch Avenue West, Unit 38	Toronto, ON M9M 2Y3	416-743-7272	416-743-3292	msergio.mpp.co@liberal.ola.org
TAC Members							
Contact Name	Contact Title	Agency Name	Mailing Address		Phone Number	Fax Number	**E-Mail Address**
Mr. Edmond Wu	Transportation Planner, Scarborough District - Wards 35-44	City of Toronto	Scarborough Civic Centre, 4th Floor, 150 Borough Drive	Toronto, ON M1P 4N7	416-396-7038	416-396-4265	ewu2@toronto.ca
Mr. Brian Gallaugher	Manager, Metrolinx Transit Program, Transportation Planning	City of Toronto	City Hall, East Tower, 21st Floor	Toronto, ON M5H 2N2	416-392-9396		bgallau@toronto.ca
Ms. Victoria Witkowski	City Planner	City of Toronto	North York Civic Centre, Ground Floor, 5100 Yonge Street	Toronto, ON M2N 5V7	416-395-7459	416-395-7155	Vawitkow@toronto.ca
Mr. Leo Desorcy	Program Manager, Urban Design	City of Toronto	North York Civic Centre, 1st Floor, 5100 Yonge Street	Toronto, ON M5H 2N2	416-395-7139	416-395-7155	ldesorcy@toronto.ca

Mr. Samuel Baptiste	Transportation Planner	City of Toronto	Etobicoke Civic Centre, 2 Civic Centre Court, 3rd Floor	Toronto, ON M9C 5A3	416-392-8232	416-394-6063	Sbaptis@toronto.ca
Ms. Edna Cuvin	Senior Urban Designer, Metrolinx Transit Program	City of Toronto	City Hall, East Tower, 21st Floor	Toronto, ON M5G 1P5	416-338-2176		ecuvin@toronto.ca
Mr. Geoffrey Lau	Right-of-Way Management Supervisor	City of Toronto	Etobicoke Civic Centre, 3rd floor, 399 The West Mall	Toronto, ON M9C 2Y2	416-394-8422		Glau@toronto.ca
Mr. Bruce Clayton	Manager, Traffic Operations	City of Toronto	Etobicoke Civic Centre, 3rd floor, 399 The West Mall	Toronto, ON M9C 2Y2	416-394-8409	416-394-8942	clayton@toronto.ca
Mr. Martin Maguire	Manager, Transit Projects	City of Toronto	North York Civic Centre, 4th floor, 5100 Yonge Street	Toronto, ON M5H 2N2	416-338-1954	416-392-4808	mmaguir@toronto.ca
Ms. Ann Khan	Manager, Traffic Operations	City of Toronto	Metro Hall, 17th Floor, 55 John Street	Toronto, ON M5V 3C6	416-397-5021	416-392-1920	akhan5@toronto.ca

A2. TPAP Notifications

METROLINX
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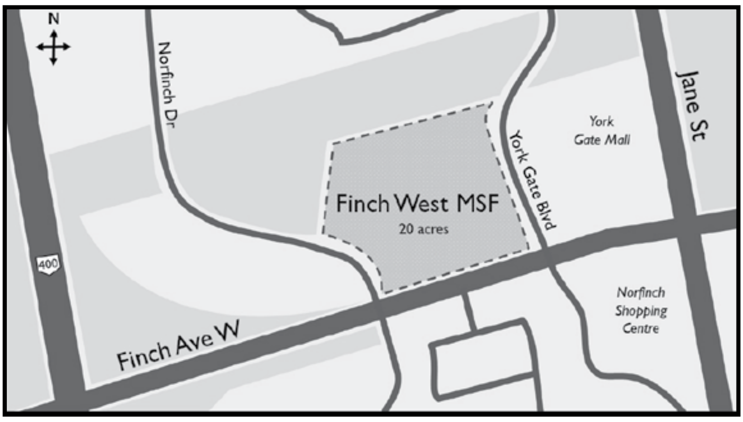
Notice of Commencement

Finch West Maintenance and Storage Facility Environmental Project Report

The Project

Metrolinx, an agency of the Government of Ontario, is proposing to construct a Maintenance and Storage Facility (MSF) to serve the Finch West Light Rail Transit (LRT) line in the City of Toronto. The purpose of the MSF is to store and maintain the light rail vehicles that will operate along the Finch West LRT corridor with an allowance for maintenance and storage of light rail vehicles that will operate on a future Jane Street LRT. The MSF will accommodate a maximum of 75 light rail vehicles.



The site is located on 8 hectares (20 acres) of vacant land owned by Metrolinx on the north side of Finch Avenue West in the City of Toronto between Norfinch Drive to the west and York Gate Boulevard to the east.

In 2010, the Minister of the Environment and Climate Change issued a Notice to Proceed for the Finch West LRT, a 17 kilometre LRT line extending from Humber College in northern Etobicoke to Yonge Street. The Environmental Project Report prepared for that project identified the location of the MSF as a potential site to store and maintain light rail vehicles, but the report did not address the potential effects of the MSF. Consequently, a new assessment of effects is required for the MSF.

The Process

The environmental impacts of this transit project will be assessed in accordance with the Transit Project Assessment Process as prescribed in Ontario Regulation 231/08, Transit Projects and Metrolinx Undertakings. As part of the Transit Project Assessment Process, an Environmental Project Report for the Finch West MSF is being prepared. All information produced as part of this project is available at **www.metrolinx.com/finchwest**.

Consultation

Members of the public, agencies and other interested persons are encouraged to participate actively in the transit project assessment process. Metrolinx will be hosting a public meeting and the public will be invited to review information about the MSF, the potential effects and the measures incorporated to mitigate those potential effects.

Additionally, throughout the environmental assessment period, the public may provide comment, request to be added to the project mailing list or obtain more information by contacting Metrolinx staff as follows:

Les MacDermid, P.Eng., Senior Project Manager
5160 Yonge Street, Suite 300
North York, ON M2N 6L9
tel: 416-228-9392
e-mail: les.macdermid@metrolinx.com

Renée Pettigrew, MCIP, RPP
Manager, Impact Assessment and Permitting
5080 Commerce Boulevard
Mississauga, ON L4W 4P2
tel: 905-712-7077
e-mail: renee.pettigrew@aecom.com

Under the *Freedom of Information and Protection of Privacy Act* and the *Environmental Assessment Act*, unless otherwise stated in the submission, any personal information such as name, address, telephone number and property location included in a submission will become part of the public record files for this matter and will be released, if requested, to any person.

For more information:

Email: finchwest@metrolinx.com
Web: www.metrolinx.com/finchwest

Tel: 416-869-3600 ext. 5739
TTY: 1-800-387-3652

Pour plus de renseignements, veuillez composer le 416 728-8118 ou le 1 800 387-3652

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PN-7444-GO
North York Mirror/York Guardian 6C (6.191) x 161ag
Metro News Toronto full page (10 x 11.5)
24 Hours full page (10 x 11.43)
Downsview Advocate full page (10.2 x 15.5)

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Notice of Completion of Environmental Project Report

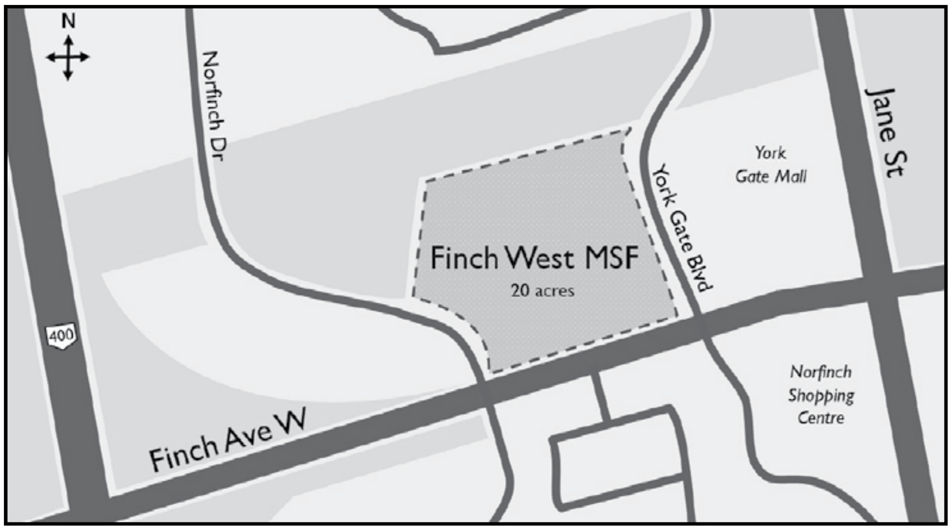
Finch West Maintenance and Storage Facility

The Project

Metrolinx has completed an Environmental Project Report (EPR) in accordance with Ontario Regulation 231/08 for the Finch West Maintenance and Storage Facility (MSF). Metrolinx intends to proceed with the project in accordance with the EPR.

In 2010, the Minister of the Environment and Climate Change issued a Notice to Proceed for the Finch West Light Rail Transit (LRT) including an 11 kilometer section extending from Humber College in northern Etobicoke to Keele Street. The EPR prepared for that project identified the location of the MSF as a potential site to store and maintain light rail vehicles (LRVs), but the report did not address the potential environmental effects of the MSF. Consequently, a new environmental assessment for the Finch West MSF was completed in accordance with the Transit Project Assessment Process.

The new 8 hectare Finch West MSF is required to support the new LRVs that will operate along the Finch West LRT corridor. The Finch West MSF will accommodate a maximum of 75 LRVs with capacity allowance for maintenance and storage of some LRVs for the future Jane Street LRT corridor. Four main buildings will be located on site including the Main Repair Shop Facility, Maintenance of Way Building, Operations Company Building and Electrical Substation. Other elements of the site also include an outdoor storage yard, LRVs hand-over platform, sanding silo, employee parking facilities and stormwater management features. In addition, track connection to the Finch West LRT corridor will be provided from York Gate Boulevard to allow for LRVs access/egress.



The Process

The potential environmental effects of this transit project was assessed and an EPR was prepared according to the transit project assessment process as prescribed in Ontario Regulation 231/08, Transit Projects and Metrolinx Undertakings.

The EPR for the Finch West MSF is now available for a 30-day review period starting **July 31, 2015** on the project website (**www.metrolinx.com/finchwest**) and at the following locations:

Ministry of the Environment and Climate Change
Central Region Office
Metro Toronto District Office
5775 Yonge Street, 8th Floor
North York, ON M2M 4J1
toll-free: 1-800-810-8048
tel: 416-326-6700

Ministry of the Environment and Climate Change
Environmental Approvals, Access and Service Integration Branch
135 St. Clair Avenue West, Ground Floor
Toronto, ON M4V 1P4
tel: 416-314-8001 or 1-800-461-6290
Available Monday to Friday from 8:30 a.m. to 5:00 p.m.

York Woods Toronto Public Library
1785 Finch Avenue West
Toronto, ON M3N 1M6
tel: 416-395-5980
Available Monday to Friday from 9:00 a.m. to 8:30 p.m.

Metrolinx
5160 Yonge Street, 3rd Floor
Toronto, ON M2N 6L9
tel: 416-869-3600 ext. 5739
Monday to Friday: 8:00 a.m. to 4:00 p.m.

Interested persons are encouraged to review this document and provide comments by **August 31, 2015** to:

Les MacDermid, P.Eng.
Senior Project Manager – Systems and MSF
Sheppard and Finch West LRT
Metrolinx, Rapid Transit Implementation
5160 Yonge Street, Suite 300
Toronto, ON M2N 6L9
e-mail: finchwest@metrolinx.com

There are circumstances where the Minister of the Environment and Climate Change has the authority to require further consideration of the transit project or impose conditions on it. These include if the Minister is of the opinion that:

- The transit project may have a negative impact on a matter of provincial importance that relates to the natural environment or has cultural heritage value or interest; or
- The transit project may have a negative impact on a constitutionally protected Aboriginal or treaty right.

Before exercising the authority referred to above, the Minister is required to consider any written objections to the transit project that he or she may receive within 30 days after the Notice of Completion of the EPR is first published.

If you have discussed your issues with the proponent and you object to the project, you can provide a written submission to the Minister of the Environment and Climate Change by no later than **August 31, 2015** to the address provided below. All submissions must clearly indicate that an objection is being submitted and describe any negative impacts to matters of provincial importance (natural/cultural environment) or Aboriginal rights.

Environmental Approvals Access and Service Integration Branch
Ministry of the Environment and Climate Change
Attention: Gavin Battarino, Special Project Officer
135 St. Clair Avenue West, 1st Floor
Toronto, ON M4V 1P5
tel: 416-314-8001 or 1-800-461-6290
fax: 416-314-8452
e-mail: EAASIBGen@ontario.ca

If not already provided, a copy of the objection will be forwarded to the proponent by the ministry.

All personal information included in a submission such as name, address, telephone number and property location is collected, maintained and disclosed by the Ministry of the Environment and Climate Change for the purpose of transparency and consultation. The information is collected under the authority of the *Environmental Assessment Act* or is collected and maintained for the purpose of creating a record that is available to the general public as described in s. 37 of the *Freedom of Information and Protection of Privacy Act*. Personal information you submit will become part of a public record that is available to the general public unless you request that your personal information remain confidential. For more information, please contact the Special Project Officer or the Ministry of the Environment and Climate Change's Freedom of Information and Privacy Coordinator at 416-327-1434.

The notice was first published on July 31, 2015.

For more information:

Email: finchwest@metrolinx.com **Tel: 416-869-3600 ext. 5739**
Web: www.metrolinx.com/finchwest **TTY: 1-800-387-3652**

Pour plus de renseignements, veuillez composer le 416 728-8118 ou le 1 800 387-3652

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North York Mirror/York Guardian full page 10C (10.375)) x 161ag
Metro News Toronto full page (10 x 11.5)
24 Hours full page (10 x 11.43)
Downsview Advocate full page (10.2 x 15.5)

A3. Public Open House #1

Metrolinx

Finch West Light Rail Maintenance and Storage Facility Environmental Assessment Public Open House #1 Summary Report

Prepared by:

AECOM
105 Commerce Valley Drive West, Floor 7 **905 886 7022** **tel**
Markham, ON, Canada L3T 7W3 **905 886 9494** **fax**
www.aecom.com

Project Number:

60318592

Date:

July, 2014

AECOM Signatures

Report Prepared By:

Madelin Blacha, B.U.R.Pl.
Environmental Planner

Report Reviewed By:

Faranak Amirsalari, MES, MCIP, RPP
Environmental Planner

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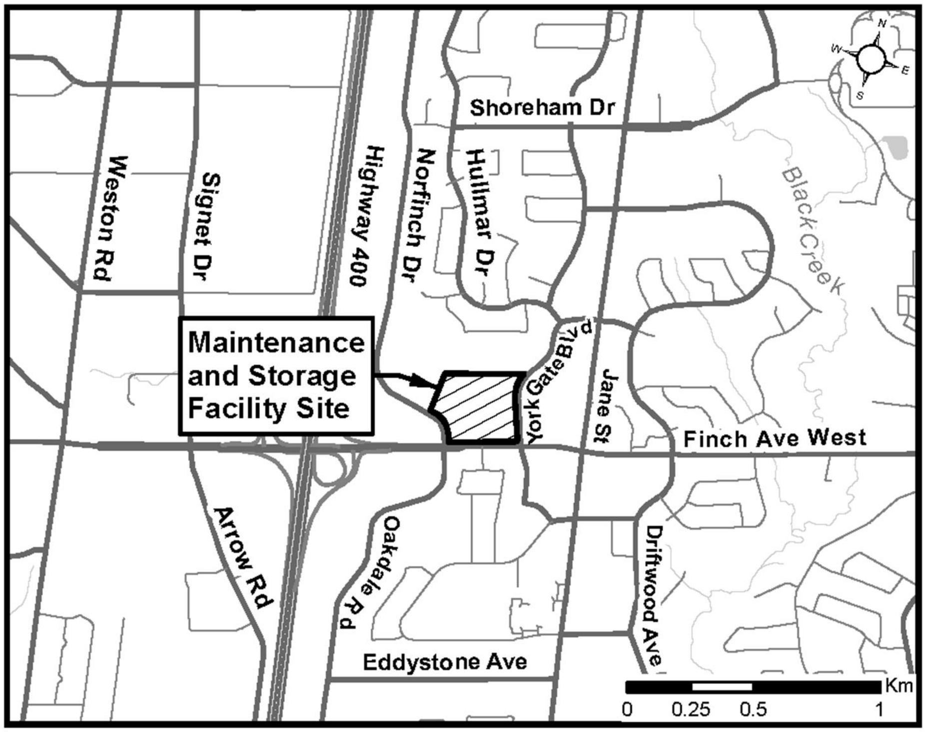
Appendices

1. Introduction

In March 2010, the Toronto Transit Commission (TTC) and City of Toronto completed a Transit Project Assessment (TPA) Process study as prescribed in Ontario Regulation 231/08 made under the *Environmental Assessment Act*, for the Etobicoke-Finch West Light Rail Transit corridor (Finch West LRT). The LRT service supports existing and future ridership demands and provides economic benefit to neighbourhoods.

A Maintenance and Storage Facility (MSF) is a component of the transit corridor that will provide maintenance and storage capacity for Light Rail Vehicles (LRVs) servicing the Finch West LRT System. The MSF is considered a necessary component of the Finch West LRT System; however the Environmental Project Report for the Finch West LRT did not include the MSF. Accordingly, a study is being conducted by Metrolinx to document the TPA Process for the Finch West MSF. The MSF is located along Finch Avenue West, just east of Highway 400 and west of Jane Street (**Figure 1-1**). The site is currently a vacant lot owned by Metrolinx.

Figure 1-1: Finch West MSF Site



The purpose of the Finch West MSF is to provide maintenance service and storage tracks for overnight storage of the new Light Rail Vehicles (LRVs) servicing the Finch West LRT system, and a main repair shop facility to maintain the new LRVs in a state of good repair. The Project is required to facilitate the enhancement of transit service for the community that will be provided through implementation of the Finch West LRT.

Public Open House (POH) #1 is a component of the Study (Preliminary Planning Step) taken prior to commencement of the TPA Process, held to receive input, comments, and concerns related to the study. The POH was held in an open house format where representatives from the Project Team were available to answer questions and discuss the details of the study.

2. Notice of Public Open House #1

2.1 Notice via Newspaper

Notice of POH #1 was published in *Metro News Toronto* on June 27, 2014 and July 4, 2014, *24 Hours Toronto* on July 2, 2014, and July 7, 2014, and the *North York Mirror* on July 3, 2014. The newspaper advertisements provided residents and stakeholders with information on how to participate actively in the study through the planned POH. The Notice of POH was also posted on the project website (www.metrolinx.com/finchwest) and can be found in **Appendix A.**

2.2 Notice via Canada Post Mail-out

Property owners within 30 metres of the MSF site were sent Notice through addressed mail from Canada Post on June 30, 2014. In addition, unaddressed mail was sent to all residents and businesses within 500 metres of the MSF site on June 30, 2014 notifying them of POH #1.

2.3 Notice to Stakeholders

Federal Agencies, Provincial Agencies, and Aboriginal Communities were provided with the Notice of POH #1 via mail and e-mail on June 30, 2014.

2.3.1 Federal Agencies

The following Federal Agencies received the notice:

- Canadian Environmental Assessment Agency
- Fisheries and Oceans Canada
- Environment Canada

2.3.2 Provincial Agencies

The following Ontario Government Agencies received the notice:

- Ministry of the Environment
- Ministry of Municipal Affairs and Housing
- Ministry of Natural Resources
- Ministry of Tourism, Culture and Sport
- Toronto and Region Conservation Authority
- Ontario Provincial Police
- Hydro One Networks Inc.

2.3.3 Aboriginal Communities

The following Aboriginal Communities received the notice:

- Aboriginal Affairs and Northern Development Canada
- Ministry of Aboriginal Affairs

- Huron-Wendat First Nation
- Six Nations of the Grand River Territory
- Mississaugas of the New Credit First Nation
- Alderville First Nation
- Beausoleil First Nation
- Chippewas of Mnjikaning (Rama)
- Curve Lake First Nation
- Métis Nation of Ontario
- Kawartha Nishwabe First Nations

2.4 Notice to Political Contacts

The following political representatives were also directly notified of the study and were invited to attend the POH:

- Giorgio Mammoliti - Toronto Ward 7 Counclilor
- Anthony Perruzza - Toronto Ward 8 Councillor
- Mario Sergio – York West Member of Provincial Parliament

3. Public Open House

The POH was an open house format where members of the project team were available to answer questions and address concerns. The session was held as follows:

Date:	Wednesday, July 9, 2014
Time:	7:00 pm to 9:00 pm
Location:	Julius Banquet Centre 2201 Finch Avenue West, Toronto, ON

Approximately 106 individuals attended the POH. Members of the Project Team were available to facilitate the understanding of information presented including the TPA Process.

The materials presented at POH #1 were made available online at the project website (www.metrolinx.com/finchwest). Online consultation was open from July 9, 2014 to July 23, 2014 and public comments were accepted through an online comment form on the project website as well.

4. Information Presented

Display panels were organized in a manner which effectively presented information on the project.
The display panels are outlined below and can be viewed in full in **Appendix B**.

- **Welcome**
- **Purpose of Tonight's Open House**
- **What is a MSF?**
- **Finch West LRT Context**
- **MSF Site Selection Process**
- **Maintenance and Storage Facility**
- **Finch West MSF EA Process**
- **Environmental Factors**

- **Existing Conditions – Terrestrial and Aquatic**
- **Existing Conditions – Geology and Groundwater**
- **Existing Conditions – Noise and Vibration**
- **Existing Conditions – Air Quality**
- **Existing Conditions – Land Use**
- **Existing Conditions – Cultural Heritage and Archaeology**
- **Existing Conditions – Traffic and Transportation**
- **Impact Assessment and Mitigation**
- **Infrastructure Ontario Process**
- **Finch West MSF EA Framework**
- **Consultation Process Timelines**
- **What Happens Next?**
- **Thank You for Participating!**

In addition to the display panels above, Metrolinx also presented information and solicited input regarding the Finch West LRT corridor.

5. Comments from the Public

This section provides a summary of the comments received based on the questions that were asked in the provided comment sheets. The comments received that were determined to directly correlate to the Finch LRT Corridor (and showed no correlation to the MSF EA study) are excluded from this section. Those who provided contact information were added to the project contact list to receive future notifications relating to the study.

In total, 23 comment sheets were completed and submitted to the project team during and after the POH. In addition, 2 comments were received through online consultation. All comment sheets and correspondence received is available in **Appendix C**.

5.1 Comments Received at Public Open House #1

The following comments are recorded and organized from the 23 comment sheets received during POH #1 on July 9, 2014.

Have we correctly identified all of the existing conditions that are important to you?[1]

Yes (8)

- Excellent project. Since 36 Finch-Humber route has the maximum number of commuters by bus. Waiting time is sometimes 30 to 40 minutes. Too many not in service buses.
- Yes, and even things I never considered.
- As far as I know. My expectations are that you will think of them all because if you create a problem that the people did not foresee, we will surely express our displeasure.
- Yes! It was great to get my questions answered.
- I have, as much as my understanding allows. I think that they are clearly revealed at tonight’s presentation and viewing this property, I never had any doubt whatsoever.
- Yes, you have without question done your homework!

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[1] *Some of responses received to this question may also be directed toward the overall Finch LRT Corridor.*

No (12)

- No. I don't believe what anybody says. Councillors and MPs are against each other. Shame on you. Where was Judy?
- No. Dangerous fuel trucking.
- No. Bike lands should be physically separated such as Sherbourne bike lane. That should be the Toronto standard. They also need to be wider. Consider 2.5 m rather than 1.6 m.
- No. The most important issue to me is that the site includes community benefits.
- Not certain why this site was chosen, could it not be incorporated as part of existing TTC yard on Arrow Road? It was difficult to visualize this project and how it would impact the community.
- No. We want community representatives (residents) on any planning and decision-making body for this facility. There are several groups concerned with transit issues (e.g. Community Action Planning Group).
- No. Improving transit is more than LRT. Need an integrated solution for Finch-Weston employment area.
- I thought there would be more information about traffic issues in the area.
- Dissatisfied that future traffic was not addressed. Underground is the way to go.
- No. We want resident representatives to have a say. Creative work by the residents like art expression and meeting spaces.
- I think impact of the MSF was the focus. I believe how the MSF can help this community should be another point to discuss. Positive impact should be assessed and discussed to help improve the community.
- Zoning not compatible.

Following this Open House we will be assessing the potential effects of the facility on the local environment. Are there any environmental factors other than those presented tonight that you would like to see included in the assessment?

Generally Satisfied with Environmental Factors Presented (8)

- It is in a safe zone.
- I believe you have them adequately covered.
- I believe environmental effects are well covered. However, the effects of taking a green space and replacing with an MSF should be assessed and analyzed.
- I feel that the site chosen is a good one provided adequate measures are taken to reduce noise to a minimal level as there is a nearby hospital and I believe a senior residence.
- No problem with the environment, I believe.

Generally Unsatisfied with Environmental Factors Presented (3)

- We were not given any environmental factors. The train yard must not be put over there. We do not want a yard there.
- We do not want this!
- I object based on the fact that the site is not zoned for outside storage, as well as noise and vibration issues. The facility would change the flavour of the neighbourhood.

Suggestions (7)

- Yes. I would like to see the impacts better use of this land will have on the social environment of Jane and Finch.

- Yes. I heard from actual residents about noise at the MSF and how it will negatively affect the hospital and senior residences. I wondered if some high sound barriers beside Highway 401 would help lessen the noise for residents.
- My concerns would address the consequent condition changes once these facilities are in place adjacent to our homes.
- Density control and how it would integrate into the community.
- There should be abatements and safeguards for air, soil, noise, and safe places for pedestrians and cyclists. Finch is also a corridor for oil/gas trucks and there needs to be safeguards for that.
- Clean air, clean soil, clean water, and oil recycling outside of the community. Finch Avenue and the gas trucks? What will happen?
- More specific on the environmental effects of LRT vs. buses. The diagrams showed old style buses, not the new articulated buses.

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

Indicated Support (4)

- I support this MSF and believe it is in a safe location.
- You have been reasonable on this topic.
- It is needed, I hope that work is done to help minimize any negative impacts. Thank you for this information session and all the people to help explain the project to us. I really appreciate public transit in all its forms.
- MSF location is good. This important Finch West LRT project needs to speed up to keep up the expectation of LRT transportation from Humber College to Finch Station.

Concerns that were raised in this section of the comment sheets relate to the following topics:

Community Engagement and Potential for Multi-Purpose Use (7)

- I would like to have a community workshop.
- Your posted information does not acknowledge how close the facility is to a very dense community. The facility is being built at the heart of Jane and Finch. As a member of the Community Action Planning Group of York West. I would like to see a working group set up that can engage with Metrolinx as the MSF is being planned.
- As residents living next to it, we want to be involved in the design. We like the Daniels Spectrum Hub in Regent Park by taking the largest empty space in the community and utilizing it.
- I would like to see a hybrid building on the corner of Jane and Finch. I would like this facility to help improve the living standards of the neighbourhood. Therefore, I think a committee (including community members) for the design should be established. This will make sure that the facility turns into a community hub and serving community and addressing their needs. Jane and Finch is a community with underfunded centers. MSF is an opportunity to invest in the people of this community. I believe Metrolinx made the right decision by choosing this site; however, focus shall not only be providing a facility for Metrolinx. Community's needs should be addressed and consideration shall be given to satisfy these needs through the MSF. This can be managed by involving community members in the design phase. Metrolinx should get together with the community groups to make sure that their voice is heard. I noticed the notification for this consultation session by luck in the Metro Newspaper. I believe the outreach shall be done more locally to the people of this community. I am expected a better and more effective outreach from Metrolinx for upcoming sessions.

In addition, I strongly suggest that a committee involving public input be created to influence the design of this building.

- While I understand community uses are very difficult to add on this congested site, there would be the possibility of having a street or hydro corridor facing building that could host a bike repair facility for a community bike share facility.
- We want to share this site to build some community use/multi-purpose facility alongside or above your MSF (think Daniels Spectrum in Regent Park). We want apprenticeships and jobs for residents in the development of the LRT and the MSF.
- We don’t want an MSF as a stand-alone building – we want community benefit e.g. resource centre, multi-service centre so that residents can jointly share with the space. Another eyesore in our community will not be welcome, rather how can we integrate a facility to ensure integration. We have the most culturally diverse community in the city – lets utilize that benefit! Bringing the LRT and MSF into our community will be an easier transition if you establish a working group consisting of residents where their voices will be heard. The working group should be people who support the LRT and are prepared to work with you to ensure success. I belong to a resident group called Community Action Planning Group who are all supporters. But Metrolinx needs to consider our issues and compromise.

Traffic (3)

- Maintenance and storage are the two words of concern in the whole picture and of course the effects on traffic in the area.
- Cars have not been taken into consideration. And neither tractor trailers. Where are they going to do a U-turn?
- For a neighbourhood as densely populated as Jane and Finch the MSF brings a lot of industrial traffic within a short distance of a lot of people.

Community Impact (3)

- We do not want this! This will play havoc with the business community!
- I am deeply disappointed that this property was selected. A prime portion of the land in our community had not been designated by any government for a building project which would directly and more beneficially impact our community. Because of this, I am by no means supporting the current decision and do hope that the community will view this in the same way and ultimately express our discontent and refuse to support the government and/or agency on this. Speaking with a representative, I concluded that it will be this property or no other. Well I do hope that you will be convinced by subsequent finding that there are more ideal uses that should and will be considered instead. I have ideas and as well I can count on others who live at and care about this community which yearns for facilities that would both bring us together in recreation and aspiration.
- This community needs infrastructure to create community, not a facility to create more problems.

Visual Impact (2)

- This is going to be an eyesore. Jane and Finch needs positive structure to help the community. We do not want an LRT. We want an underground subway.
- I would want to be assured that the MSF will not be an eyesore as when I’m sitting on my veranda I’m facing the proposed site. I hope some wall will surround the site that does not look ugly. Also it would be good if access to the site is not in front of where Finch and Pelican Gate intersect as this is a residential gateway.

Future EA Open House Logistics (2)

- You need to have a meeting closer to Jane and Finch!
- Your efforts to alert the local communities of your need for input should be expanded beyond the 500 m radius from the MSF site to include apartment buildings whose residents are likely to use the LRT and to contact all local groups that are already engaged in related issues

Questions for the Project Team:

- How does it affect the flow of traffic and reflect our businesses?
- How much money will be affected?
- What LEED designation will it achieve?
- Will there be any toxic materials stored at the site?
- When is the next meeting?

5.2 Comments Received during Online Consultation

The following 2 comments were received during online consultation between July 9, 2014 and July 23, 2014.

- This comment was received on July 9, 2014 through the project website: Believes that the MSF site is a good use of currently vacant land. Would like a study to be undertaken of the impacts of working in close proximity to a hydro corridor so that health of employees is not compromised.
- Comment was received on July 14, 2014 through project e-mail: Looking for a contact for this project on behalf of McGraw-Hill, a news gathering and analytical service that tracks construction projects throughout Canada/USA for the benefit of industry trades.

6. Comments from External Agencies

6.1 Federal and Provincial Agencies

A total of 4 comments were received from Federal and Provincial Agencies in response to the POH #1 and are summarized in **Table 6-1** below. None of the agencies attended POH #1. All correspondence received is available in **Appendix D**.

Table 6-1: Summary of Agency Comments/Concerns

Comment	Agency/Contact
• E-mail received on June 30, 2014: Expressed that the proposed MSF would likely be opposed if any part of the building is constructed on Hydro One lands. All plans to date were also requested.	Tony Ierullo Senior Network Management Officer Hydro One Networks Inc.
• E-mail received on July 2, 2014: Will pass along the Eastern Meadowlark observations received from Project Team to MNR SAR specialists for further review and next steps.	Jackie Burkart District Planner Ministry of Natural Resources
• E-mail received on July 15, 2014: No comments or concerns with the proposed development. Requested to be kept on the circulation list.	Renee Afoom-Boateng Senior Planner Toronto and Region Conservation Authority
• E-mail received on July 23, 2014: If less than or equal to 30 ha	Natosha Fortini

of Eastern Meadowlark habitat is damaged or destroyed and the rules set out in the regulation can be met, then the proposed MSF may be eligible for registration. However, if the proposed MSF will damage or destroy more than 30 ha of the habitat or rules in the regulation cannot be met, a 17(2)(c) permit would be required under the *Endangered Species Act, 2007* to damage or destroy Eastern Meadowlark habitat. The first step in this process would be to fill out an Information Gathering Form and submit it to ESA Aurora.	Fish and Wildlife Technical Specialist Ministry of Natural Resources

6.2 Aboriginal Communities

No comments were received from Aboriginal communities. None of these groups attended POH #1.

6.3 Political Representation

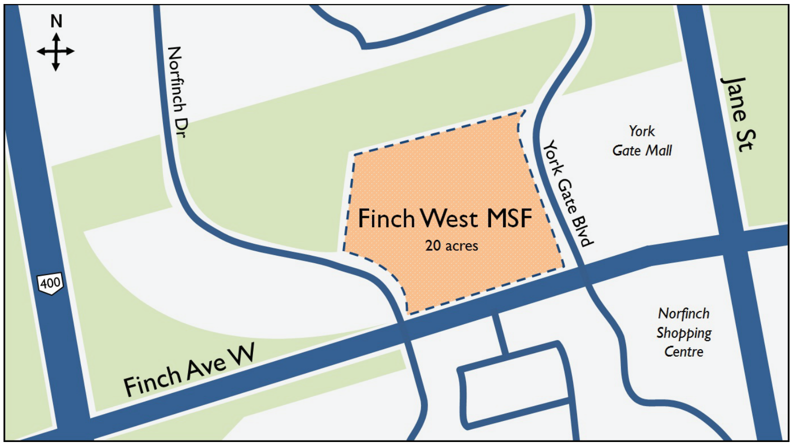
No comments were received from political contacts.

A3. Public Open House #1

Appendix A
Notice of Public Open House #1

Finch West Light Rail Transit Project (LRT): Maintenance and Storage Facility

The Finch West LRT will add 11 kilometres of new rapid transit along Finch Avenue from the planned Finch West subway station at Keele Street to Humber College. The new service will provide improved, faster and reliable transit.



Metrolinx invites you to attend a public information meeting to learn about plans for a Maintenance and Storage Facility (MSF) to support the future Finch West Light Rail Transit line. The identified location for the MSF is a vacant property on Finch Avenue West between Norfinch Drive and Yorkgate Boulevard.

Metrolinx is undertaking planning activities in preparation for an Environmental Assessment (EA) to study and address the potential environmental effects of the MSF and include recommended measures to mitigate any effects identified through our planning activities.

At this public information meeting, Metrolinx will:

- present the Finch West LRT project
- introduce the MSF project
- present the existing environmental conditions of the site
- seek comment about the scope of the environmental assessment

The meeting will provide an opportunity to view displays, submit comments and speak one-on-one with staff.

Date: Wednesday, July 9, 2014
Time: 7:00 p.m. to 9:00 p.m.
Location: Julius Banquet Centre, 2201 Finch Avenue West

For more information:

Email: finchwest@metrolinx.com
Web: www.metrolinx.com/finchwest

Tel: 416-782-8118
TTY: 1-800-387-3652

A3. Public Open House #1

Summary Report Appendix B
Diplay Panels

FINCH WEST LIGHT RAIL VEHICLE MAINTENANCE AND STORAGE FACILITY ENVIRONMENTAL ASSESSMENT

PUBLIC OPEN HOUSE

July 9, 2014 | Julius Banquet Centre
2201 Finch Avenue West
7:00 p.m. to 9:00 p.m.

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Welcome to the Open House

Finch West Light Rail Transit (LRT) Project Maintenance and Storage Facility (MSF) Environmental Assessment

Please sign-in so that we may provide you with updates on future events.

- Comment sheets are available
- E-mail: finchwest@metrolinx.com
- Online: www.metrolinx.com/finchwest

Purpose of Tonight's Open House

- Introduce the MSF to the public
- Describe the MSF site
- Explain how the EA will address potential impacts and propose mitigation measures
- Seek your comments on existing conditions

What is a MSF?

- Provide maintenance service and storage tracks for overnight storage of the Light Rail Vehicles.

- Elements of the MSF include:
    - Main Repair Shop
    - Maintenance of Way
    - Operations, and
    - Electrical Substation

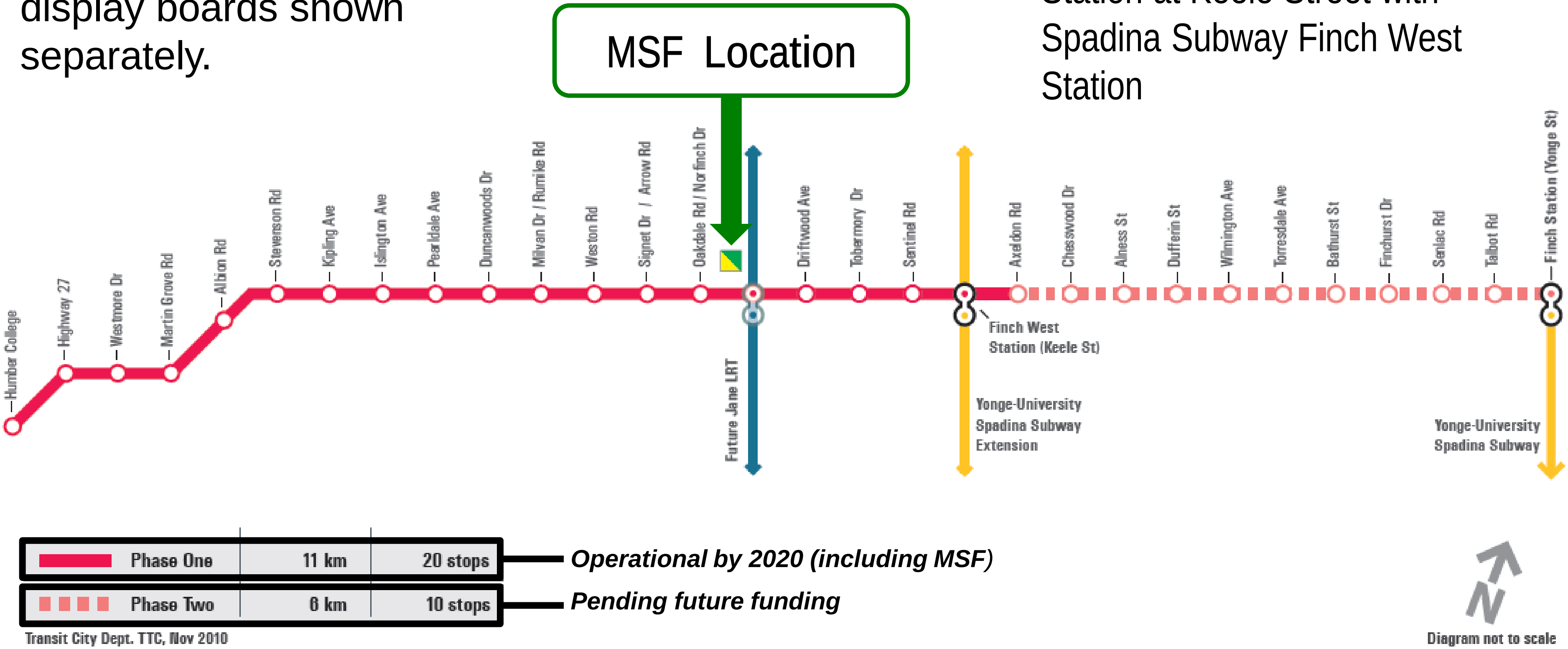
Typical MSF -TTC Leslie Barns Concept MSF (formerly Ashbridges Bay)

Typical MSF - Sheppard East Concept MSF

Finch West LRT Context

- Approximately 11 kms of surface alignment from Humber College to east of Keele Street
- 18 At Grade Stops
- 1 Below Grade Interchange Station at Keele Street with Spadina Subway Finch West Station

For additional information on the LRT, please refer to LRT display boards shown separately.



🟥	Phase One	11 km	20 stops
▪▪▪▪	Phase Two	6 km	10 stops

Operational by 2020 (including MSF)

Pending future funding

Transit City Dept. TTC, Nov 2010

MSF Site Selection Process

- A previous assessment was developed by TTC to identify a location to accommodate the Finch West MSF.

Site 1 - Southeast corner of Finch Ave. W & Weston Rd.

Site 2 - #122 & #130 Arrow Rd.

Site 3 - Finch Ave W between CN Rail & Chesswood Dr.

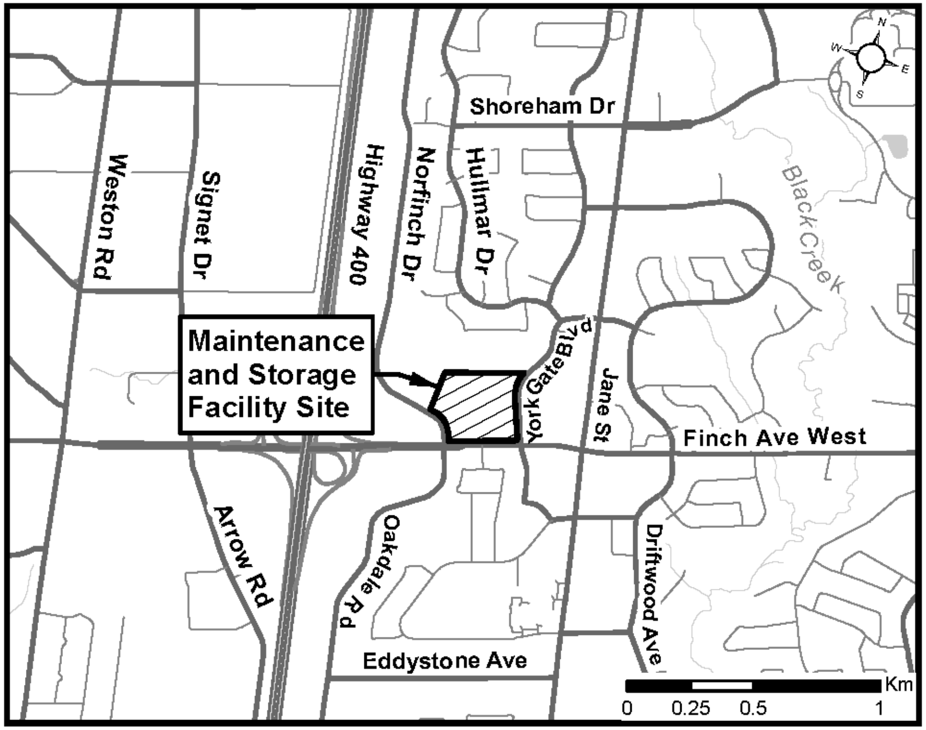
Site 4 - Finch Ave. W between Norfinch Dr. & York Gate Blvd.

	Property Size	Proximity to LRT line	Site Availability/ Vacancy
Site 1	X	✓	X
Site 2	✓	X	X
Site 3	X	✓	X
Site 4	✓	✓	✓

Site 4 has been selected as the optimal site for the MSF and is carried forward as the focus of this EA

Maintenance and Storage Facility

- The MSF will service up to 75 LRV for the Finch West LRT Line and future Jane LRT Line.



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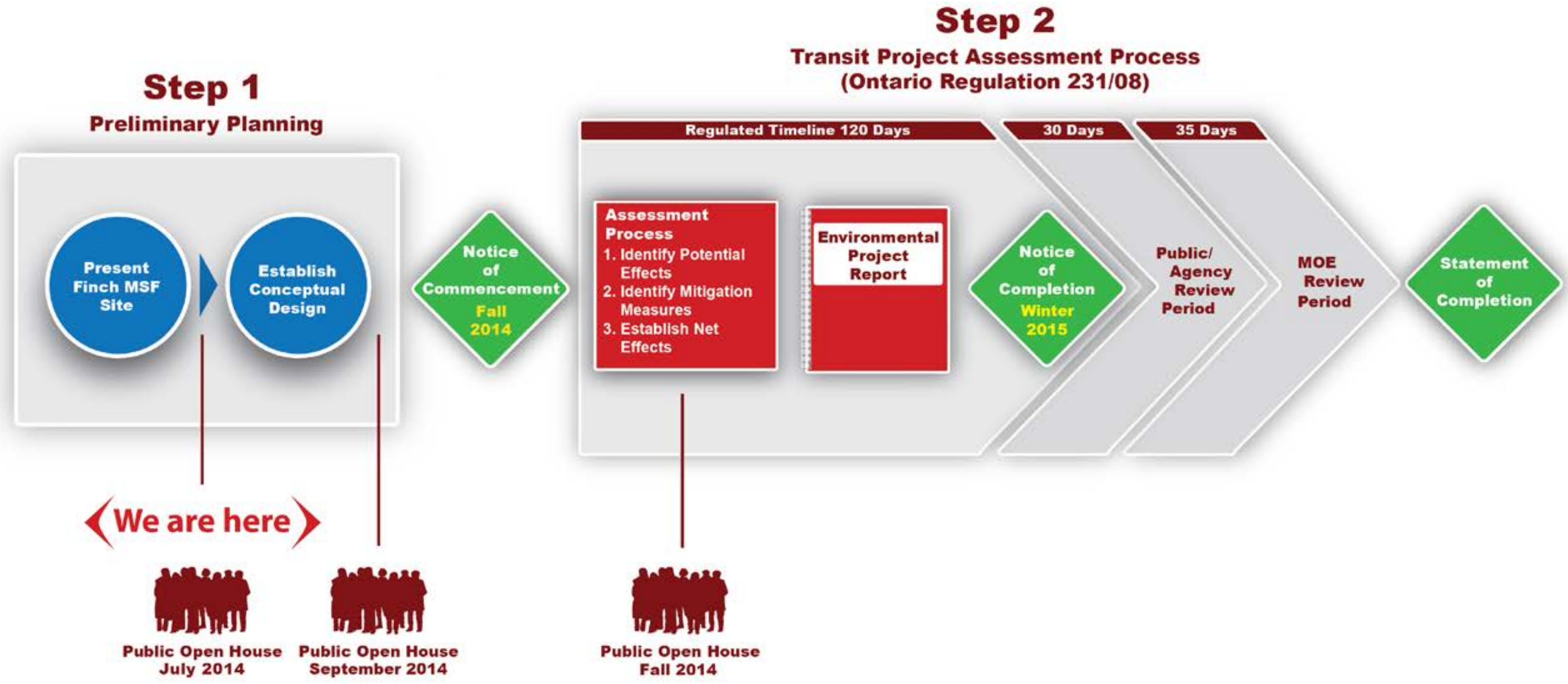
Finch West MSF EA Process

- **Step 1 (Preliminary Planning):** Presenting the Site, Establishing Conceptual Site Design, and Documenting Existing Conditions.
- Step 2 (TPAP): Assessment of Effects, Preparation of Environmental Project Report, Public and Agency review.



Step 1
Preliminary Planning

Present Finch MSF Site

Establish Conceptual Design

Notice of Commencement
Fall 2014

Step 2
Transit Project Assessment Process
(Ontario Regulation 231/08)

Regulated Timeline 120 Days

30 Days

35 Days

Assessment Process
1. Identify Potential Effects
2. Identify Mitigation Measures
3. Establish Net Effects

Environmental Project Report

Notice of Completion
Winter 2015

Public/ Agency Review Period

MOE Review Period

Statement of Completion

We are here

Public Open House
July 2014

Public Open House
September 2014

Public Open House
Fall 2014

Environmental Factors

- Natural Environment
  - Terrestrial and Aquatic
  - Geology and Hydrogeology
- Cultural Environment
  - Cultural Heritage
  - Archaeology
- Traffic & Transportation

- Socio-Economic Environment
  - Land Use and Visual Character
  - Community Features
  - Noise and Vibration
  - Air Quality

Environmental effects mitigation for conceptual site design will be developed based on an evaluation under all environmental factors combined with public and stakeholder input

Existing Conditions - Terrestrial and Aquatic

- Predominately grassy meadow within an urban setting.
- Ontario Species at Risk bird identified within the study area.
- Protected under Ontario *Endangered Species Act* Regulation 230/08.
- No significant surface water or drainage pattern.

View from Northwest Portion of Site

View from West Portion of Site

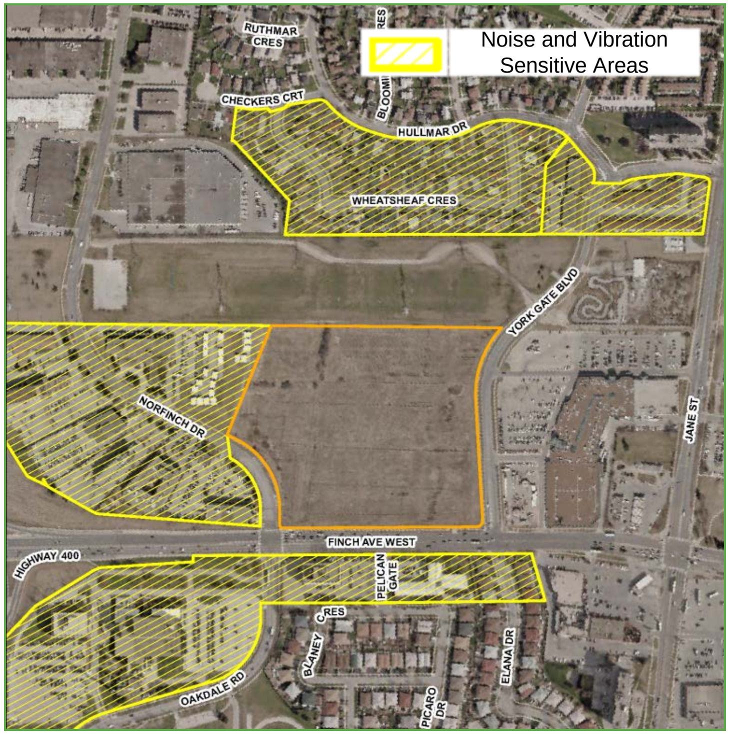
Existing Conditions - Geology & Groundwater

- No significant regional aquifer present.
- No existing contamination on-site.
- Soil and groundwater results meet Ministry of Environment standards for residential/ parkland property use.

On-site Groundwater Monitoring Well

Existing Conditions - Noise & Vibration

- Dominant source of existing noise and vibration is vehicular traffic.
- Monitors were installed to measure existing noise and vibration levels at Sensitive Areas.
- Vibration levels are typical to areas near arterial roadways.



Residences along Wheatsheaf Cres, York Gate Blvd, & Elana Dr. Institutions along Finch Ave, Norfinch Dr, & Oakdale Rd.

Existing Conditions - Air Quality

- Dust, fine particulate, VOCs and other air contaminants were surveyed.
- A number of facilities exist within one km of the property with the potential to emit air contaminants.
- Air Quality Indices (MOE criteria) for existing fine particulate and oxides of nitrogen were “Very Good” most of the time, and “Poor” less than 7% of the time.

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Existing Conditions - Land Use

- **North:** Hydro Corridor with existing recreational trail and soccer fields
- **East:** Shopping Mall (York Gate Mall)
- **West & South**: Hotels, Institutional uses, including Humber River Regional Hospital, police station, multiple retirement residences, and a school
- **Southeast:** Low density residential
- Residential community north, east and south.
- Highway 400 is a significant barrier west of site.

Existing Conditions -
Cultural Heritage & Archaeology

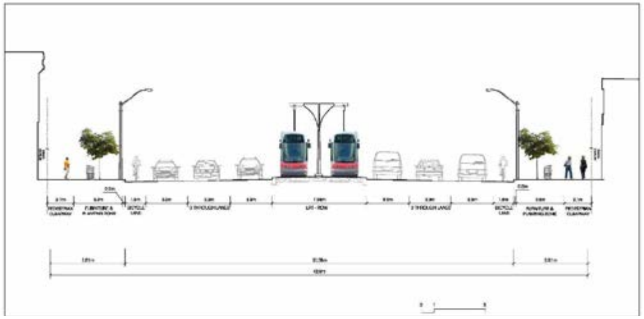
- No identified Cultural Heritage Resources on-site and within 500 metres of site.
- Site cleared of Archaeological Concern.

View from Southwest Portion of Site

View from Northeast Portion of Site

Existing Conditions - Traffic &Transportation

- Existing traffic operates within acceptable levels of service all key intersections within study area.
- Sidewalks present on both sides of all roadways.
- Immediately serviced by three TTC bus routes, within close proximity to two other TTC bus routes.
- Existing off-road bicycle trail including bicycle-traffic signals at intersection with York Gate Blvd.
- On road bicycle lanes are planned on both sides of Finch Avenue West as part of LRT implementation.



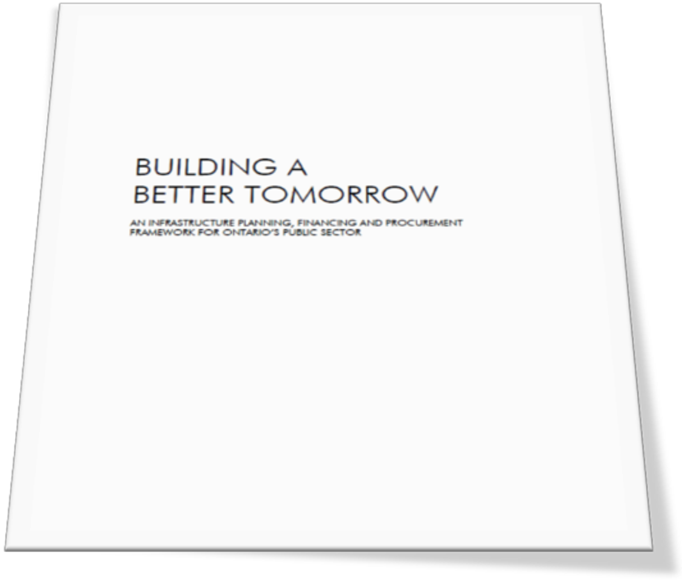
Typical Finch Avenue West Cross Section (Jane Street to Weston Road)

Impact Assessment & Mitigation

- As part of the EA Process, we will assess environmental factors.
- Modeling of environmental factors will include:
  - **Traffic** assessment will predict changes in traffic flow along roadways and at key intersections.
  - **Noise and vibration** assessment will show predicted decibel outputs from the site.
  - **Air** dispersion model will show air contaminants at ground-level for various receptor points near the site.
- Further site assessments and field visits will occur for **natural environment** and **socio-economic** conditions.
- Measures to mitigation potential impacts will be considered in the design, as required.

Infrastructure Ontario Process

- Metrolinx is partnering with Infrastructure Ontario (IO) to develop the MSF and the Finch West LRT.
- The project will be designed and constructed using IO's Alternative Financing and Procurement (AFP) delivery model which allows of technical innovation.
- IO plays a key role in Ontario's long-term infrastructure plan for public transit.

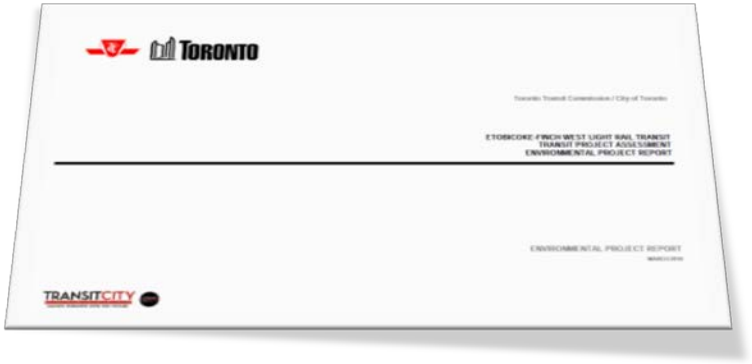


BUILDING A
BETTER TOMORROW

AN INFRASTRUCTURE PLANNING, FINANCING AND PROCUREMENT
FRAMEWORK FOR ONTARIO'S PUBLIC SECTOR

Finch West MSF EA Framework

- The project is carried out under Ontario Regulation 231/08, Transit Project Assessment (TPA) Process.
- The effects of the MSF were not assessed as part of the approved Finch West LRT EA.



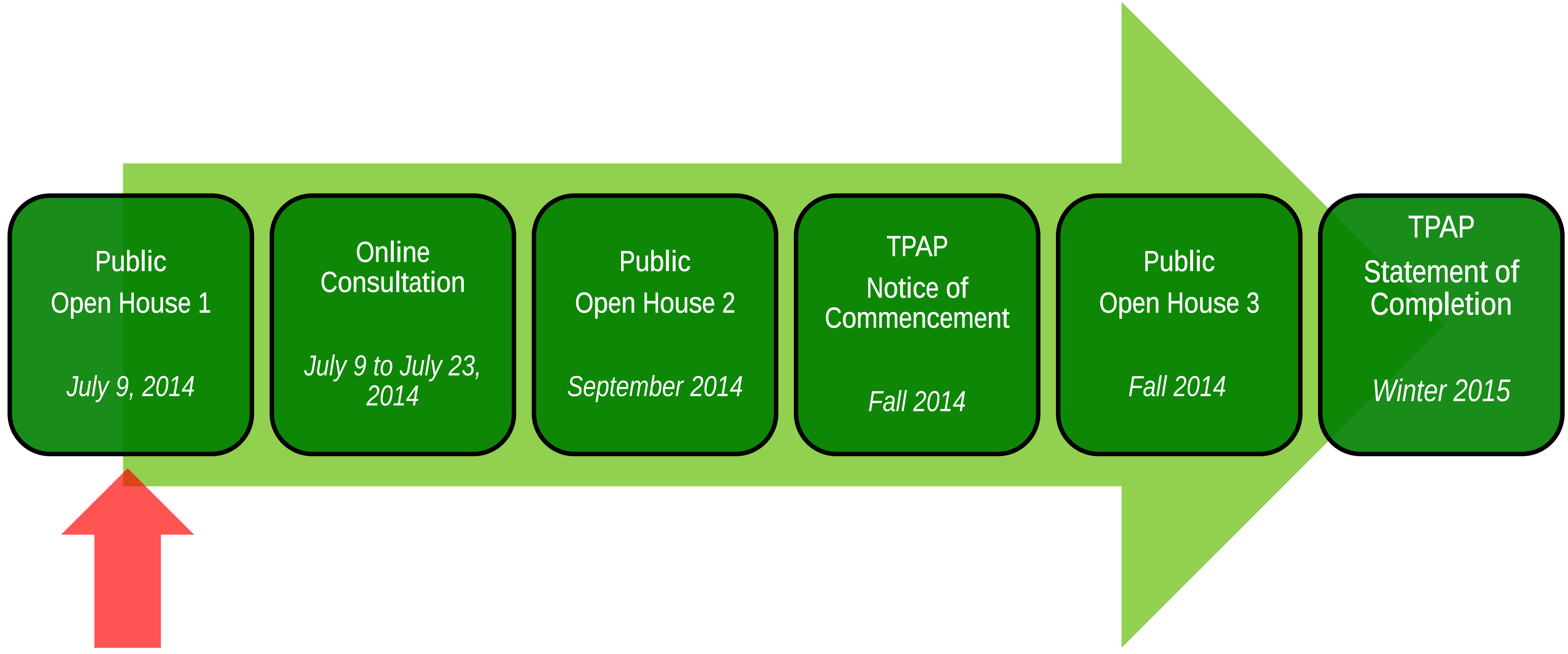
Toronto Transit Commission / City of Toronto

ETOBICOKE-FINCH WEST LIGHT RAIL TRANSIT
TRANSIT PROJECT ASSESSMENT
ENVIRONMENTAL PROJECT REPORT

ENVIRONMENTAL PROJECT REPORT

- A new stand-alone EA for the Finch West MSF is underway.
- Provides documentation of potential environmental effects and proposed mitigation measures and seeks public comment.

Consultation Process Timelines



Public
Open House 1

July 9, 2014

Online
Consultation

July 9 to July 23, 2014

Public
Open House 2

September 2014

TPAP
Notice of
Commencement

Fall 2014

Public
Open House 3

Fall 2014

TPAP
Statement of
Completion

Winter 2015

WE ARE HERE

What Happens Next?

- Please submit MSF EA comments to the project team by **July 23, 2014**.
- All comments received from today's session and throughout the study will be reviewed and considered by the project team.
- A Consultation Summary Report will be posted on the project website in August 2014.
- Using feedback, the project team will develop design(s) for the site.
- Present the design(s) at a second Open House in September, 2014; and
- Visit the project website to view the latest project developments and future consultation.

Thank you for participating!

Please get in touch with us:

WEBSITE	**www.metrolinx.com/finchwest**
EMAIL	**finchwest@metrolinx.com**
PHONE	**416-782-8118**
TTY	**1-800-387-3652**

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UP
Union
Pearson
Express

A3. Public Open House #1

Summary Report Appendix C
Public Comments

#

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COMMENT SHEET

Finch West Light Rail Vehicle Maintenance and Storage Facility
Environmental Assessment Study
Public Open House #1 – July 9, 2014

Please take a few minutes to return your comments this evening or by **July 23th, 2014** via e-mail to:

E-mail: finchwest@metrolinx.com
Phone: 416-782-8118 **TTY: 1-800-387-3652**
Website: www.metrolinx.com/finchwest;

Have we correctly identified all of the existing conditions that are important to you?

NO. I DONT Believe what anyBODY SAYS.
COUNCILORS & MP AGAINST EACH OTHER.
SHAME ON YOU.
WHERE WAS JUDY ??

Following this Open House we will be assessing the potential effects of the facility on the local environment. Are there any environmental factors other than those presented tonight that you would like to see included in the assessment?

WE were not given ANY ENVIRONMENTAL FACTORS.
THE TRINN YARD MUST NOT BE PUT OVER THERE
WE DO NOT WANT A YARD THERE.

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

THIS IS GOING TO BE AN EYESORE. JANE & FINCH
NEEDS. POSITIVE STRUCTURE TO HELP THE COMMUNITY.
WE DO NOT WANT AN LRT. WE WANT A
~~SUB~~ UNDERGROUND SUBWAY.
CARS HAVE NOT BEEN TAKEN INTO CONSIDERATION.
AND NEITHER TRACTOR TRAILERS. WHERE ARE THEY
GOING TO DO A "U" TURN

If you would like to be added to the project mailing list, please give us your postal or email address (please print clearly):

Name: [redacted]
E-mail:
Address:
City:
Postal Code: [redacted]
Phone #:

#

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Phone: 416-782-8118 **TTY: 1-800-387-3652**
Website: www.metrolinx.com/finchwest;

Have we correctly identified all of the existing conditions that are important to you?

No — DANGEROUS Fuel TRucking

Following this Open House we will be assessing the potential effects of the facility on the local environment. Are there any environmental factors other than those presented tonight that you would like to see included in the assessment?

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

If you would like to be added to the project mailing list, please give us your postal or email address (please print clearly):

Name: [redacted]
E-mail:
Address:
City: **Postal Code:**
Phone #:

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Finch West Light Rail Vehicle Maintenance and Storage Facility Environmental Assessment Study
Public Open House #1 – July 9, 2014

Your efforts to alert the local communities of your need for input should be expanded beyond the 500 meter radius from the MSF site 1) To include apartment buildings whose residents are likely to use the LRT

2) To contact all ~~toge~~ local groups that are already engaged in related issues.

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Finch West Light Rail Vehicle Maintenance and Storage Facility Environmental Assessment Study

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E-mail: finchwest@metrolinx.com
Phone: 416-782-8118 **TTY: 1-800-387-3652**
Website: www.metrolinx.com/finchwest;

Have we correctly identified all of the existing conditions that are important to you?

Following this Open House we will be assessing the potential effects of the facility on the local environment. Are there any environmental factors other than those presented tonight that you would like to see included in the assessment?

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

* I would like to have a community work shop

* A community liary

*

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Finch West Light Rail Vehicle Maintenance and Storage Facility
Environmental Assessment Study
Public Open House #1 – July 9, 2014

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E-mail: finchwest@metrolinx.com
Phone: 416-782-8118 **TTY: 1-800-387-3652**
Website: www.metrolinx.com/finchwest;

Have we correctly identified all of the existing conditions that are important to you?

How does it effect the flow of traffic and reflect our businesses.
How much money will be affected.?

Following this Open House we will be assessing the potential effects of the facility on the local environment. Are there any environmental factors other than those presented tonight that you would like to see included in the assessment?

We do not want this!

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

We do not want this!

If you would like to be added to the project mailing list, please give us your postal or email address (please print clearly):

Name: [redacted]
E-mail:
Address:
City: **Postal Code:** [redacted]
Phone #:

METROLINX
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COMMENT SHEET

Finch West Light Rail Vehicle Maintenance and Storage Facility
Environmental Assessment Study
Public Open House #1 – July 9, 2014

We do not want this to happen!
– Subway –

– this will play havic with business community.

#

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COMMENT SHEET

Finch West Light Rail Vehicle Maintenance and Storage Facility
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Public Open House #1 – July 9, 2014

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E-mail: finchwest@metrolinx.com
Phone: 416-782-8118 **TTY:** 1-800-387-3652
Website: www.metrolinx.com/finchwest;

Have we correctly identified all of the existing conditions that are important to you?

No, Bike lanes should be physically seperated such as Sherburne bike lane. That should the new Toronto standard everywhere. They also need to be wider such as 2.5m not 1.6m.

Following this Open House we will be assessing the potential effects of the facility on the local environment. Are there any environmental factors other than those presented tonight that you would like to see included in the assessment?

more specific on the environmental affects of LRT vs. Buses – diagram ~~shout~~ showed old style buses – not new articulated buses.

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

What LEED Designation will it achieve?

There are 4 levels, platinum, gold, silver, bronze

If you would like to be added to the project mailing list, please give us your postal or email address (please print clearly):

Name: [redacted]
E-mail: [redacted]
Address: [redacted]
City: [redacted] **Postal Code:** [redacted]
Phone #: [redacted]

#_____

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Finch West Light Rail Vehicle Maintenance and Storage Facility
Environmental Assessment Study
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Have we correctly identified all of the existing conditions that are important to you?

Excellent project Since Finch-Humber route has the maximum number of commuters by Bus (36) & waiting time sometimes is upto 30 to 40 mins. "TOO MANY NOT IN SERVICE BUSES (36, 36B) OBSERVED DURING RUSH HOURS (MORNING & EVENINGS)"

Following this Open House we will be assessing the potential effects of the facility on the local environment. Are there any environmental factors other than those presented tonight that you would like to see included in the assessment?

NO problem with the environment I believe.

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

Maintenance & Storage facility location is OK.

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Good chosen location.

This important Finch West [illegible] LRT Project requires to speed up to keep the expectations of LRT Transportation from Humber College to Finch Subway.

____

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Have we correctly identified all of the existing conditions that are important to you?

No – the most important issue to me is that the proposed site of the SMF include community benefits.

Following this Open House we will be assessing the potential effects of the facility on the local environment. Are there any environmental factors other than those presented tonight that you would like to see included in the assessment?

Yes I would like to see the impacts better uses of this land will have on the social environment of Jane & Finch.

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

For a neighborhood as densely populated as Jan and Finch the MSF facility brings a lot of industrial traffic within a short distance of a lot of peple.

does not aknowledge how close the facility is to a very dense community. The facility is being built at the heart of Jane and Finch.

As a member of The Community Action Planning Group of York West. I would like to see a Working Group set up that can engage with Metrolinx as the OMSF is being planned.

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Have we correctly identified all of the existing conditions that are important to you?

Yes, and even things I never considered

Following this Open House we will be assessing the potential effects of the facility on the local environment. Are there any environmental factors other than those presented tonight that you would like to see included in the assessment?

Yes I heard from actual residents about noise at the MSF and how it will negatively affect a hospital + 2 senior residences. I wondered if some high sound barriers (like beside Highway 401) would help lessen the noise for residents

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

– it is needed - just hope that work is done to help minimize any negative impacts.

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Thank you for this information session and all the people to help [illegible] to explain this project to us.

I really appreciate public transit in all its forms.

______

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Have we correctly identified all of the existing conditions that are important to you?

As far as I know. My expectations are that you will think of them all because if you create a problem that the people did not foresee, we will surely express our displeasure.

Following this Open House we will be assessing the potential effects of the facility on the local environment. Are there any environmental factors other than those presented tonight that you would like to see included in the assessment?

I feel that the site choosen is a good one ~~but~~ provided adequate measures are taken to reduce noise to a minimal level as there is a nerely hospital and I believe a senior residence.

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

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[redacted]

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Have we correctly identified all of the existing conditions that are important to you?

Yes! It was great to get my questions answered.

Following this Open House we will be assessing the potential effects of the facility on the local environment. Are there any environmental factors other than those presented tonight that you would like to see included in the assessment?

No.

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

While I understand community uses are very difficult to add on this congested site, there would be the possibility of having a street or hydro corridor facing building that could host a bike repair facility ~~o~~for a community bike share. focused on utility uses

#

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Have we correctly identified all of the existing conditions that are important to you?

I HAVE, AS MUCH AS MY UNDERSTANDING ALLOWS - I THINK THAT THEY ARE CLEARLY REVEALED AT TONIGHT'S PRESENTATION AND VIEWING THIS PROPERTY, I NEVER HAD ANY DOUBT WHATSOEVER THAT THIS IS PRIME.

Following this Open House we will be assessing the potential effects of the facility on the local environment. Are there any environmental factors other than those presented tonight that you would like to see included in the assessment?

MY CONCERNS WOULD ADDRESS THE CONSEQUENT CONDITIONS CHANGES ONCE THESE FACILITIES ARE IN PLACE ADJACENT TO OUR HOMES.

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

MAINTENANCE AND STORAGE ARE THE TWO WORDS OF CONCERN IN THE WHOLE PICTURE AND OF COURSE THE EFFECTS OF TRAFFIC IN THE REGION.

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COMMENTS OVER PAGE.

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I AM DEEPLY DISAPPOINTED THAT THIS PROPERTY - A PRIME PORTION OF LAND IN OUR COMMUNITY HAD NOT BEEN DESIGNATED BY ANY GOVERNMENT FOR A BUILDING PROJECT WHICH WOULD DIRECTLY AND MORE BENEFICIALLY IMPACT THE PEOPLE OF OUR COMMUNITY. BECAUSE OF THIS I AM BY NO MEANS SUPPORTING THE CURRENT DECISSION AND DO HOPE THAT THE COMMUNITY WILL VIEW THIS IN THE SAME WAY AND ULTIMATELY EXPRESS OUR DISCONTENT AND REFUSE TO SUPPORT THE GOVERNMENT AND/OR AGENCY ON THIS. SPEAKING WITH A REPRESENTATIVE I CONCLUDED THAT IT WILL BE THIS PROPERTY OR NO OTHER. WELL I DO HOPE THAT YOU WILL BE CONVINCED BY SUBSEQUENT FINDINGS THAT THERE ARE MORE IDEAL USE THAT SHOULD AND WILL BE CONSIDERED INSTEAD. I HAVE IDEAS AND AS WELL I CAN COUNT ON OTHERS WHO LIVE AT AND CARE ABOUT THIS COMMUNITY WHICH LEARNING FACILITIES THAT WOULD BOTH BRING US TOGETHER IN RECREATION AND ASPIRATION.

#____

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Have we correctly identified all of the existing conditions that are important to you?

Yes
Safe

Following this Open House we will be assessing the potential effects of the facility on the local environment. Are there any environmental factors other than those presented tonight that you would like to see included in the assessment?

It's in a safe zone.

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

My Name is CHRIS NOOR I am running for city councill ward 1 Oct 27 - and I support this Maintenance Facility Also it has already being ~~pass~~ in a safe location.

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Address: [redacted]
City: [redacted] **Postal Code:** [redacted]
Phone #: [redacted]

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Have we correctly identified all of the existing conditions that are important to you?

· NOT CERTAIN WHY THIS SITE WAS CHOSEN, COULD IT NO BE INCORPORATED AS PART OF EXISTING TTC YARD ON ARROW ROAD.
-IT WAS DIFFICULT TO VISUALIZE THIS PROJECT AND HOW IT WOULD IMPACT COMMUNITY.

Following this Open House we will be assessing the potential effects of the facility on the local environment. Are there any environmental factors other than those presented tonight that you would like to see included in the assessment?

DENSITY CONTROL AND HOW IT WOULD INTEGRATE INTO THE COMMUNITY.

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

PLEASE ADVISE OF THE NEXT MEETING.

If you would like to be added to the project mailing list, please give us your postal or email address (please print clearly):

Name: [redacted]
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Address:
City:
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Phone #:

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Have we correctly identified all of the existing conditions that are important to you?

No. We want community representatives (residents) on any planning and decision-making body for this facility in our community. For example, there are several groups concerned with transit issues (e.g. Community Action Planning Group)

Following this Open House we will be assessing the potential effects of the facility on the local environment. Are there any environmental factors other than those presented tonight that you would like to see included in the assessment?

There should be abatements and safeguards for air, soil, noise, and safe places to cross for pedestrians and cyclists. Finch is also a corridor for oil/gas tanker trucks and there needs to be safeguards for that

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

We want to share the site to build some community use/multi-purpose facility alongside or above your MSF. (E.g., Daniel Spectrum in Regent Park)

We want apprenticeships and jobs for residents in the development of the LRT and the MSF.

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City: **Postal Code:** [redacted]
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Have we correctly identified all of the existing conditions that are important to you?

No: improving transit is more than LRT. Need integrated solution for Finch/Weston employment area.

Following this Open House we will be assessing the potential effects of the facility on the local environment. Are there any environmental factors other than those presented tonight that you would like to see included in the assessment?

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

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Have we correctly identified all of the existing conditions that are important to you?

I thought there would be more information about traffic issues in the area.

Following this Open House we will be assessing the potential effects of the facility on the local environment. Are there any environmental factors other than those presented tonight that you would like to see included in the assessment?

No

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

Will there be any toxic materials stored at the [illegible] site? ~~Concerned about add~~

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There is mention in the EA assessment of a species at risk on the site (Bird) but no mention of how this will be mitigated. I'm also concerned about further contamination to the Humber River. ~~via~~ ~~ground~~ ~~seep~~

#_____

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Have we correctly identified all of the existing conditions that are important to you?

Trafic in the future
- its bad enought today - when you take Lanes for This Light rail, it will be worst
- ~~to~~ underground is the way to go.
- Think about Young St with Light Rail, you will not move today

Following this Open House we will be assessing the potential effects of the facility on the local environment. Are there any environmental factors other than those presented tonight that you would like to see included in the assessment?

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

If you would like to be added to the project mailing list, please give us your postal or email address (please print clearly):

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Addres
City: f
stal Code: [redacted]
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Have we correctly identified all of the existing conditions that are important to you?

Not yet sure - can I get a copy of all the displays to review more leisurely? wardmacnevin@rogers.com

Following this Open House we will be assessing the potential effects of the facility on the local environment. Are there any environmental factors other than those presented tonight that you would like to see included in the assessment?

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

We don't want a maintenance ~~facility~~ facility ~~without~~ as a stand alone building - we want community benefit eg. Resource Centre, Arts Hub, Multiservice Centre so residents can jointly share with the space. Another "eye-sore" in our community will not be welcome, rather how can we integrate a facility to ensure integration. We have the most culturally diverse community in the City - lets ~~that~~ utilize that benefit!

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Bringing the LRT & facility to our community will be an easier transition if you establish a working group consisting of residents where there voices will be heard & considered.

The working group should be people who support the LRT & are prepared to work with you to ensure success.

I belong to a Resident Group called Community Action Planning Group who are all supporters. But Metrolinx need to consider our issues & compromise.

This consultation is not representative of the Jane Finch I know - I've met lots of home-owners but I'm not seeing all the people from the apartment nor the Black community, Cambodian, Vietnamese, etc. You need to have a meeting closer to Jane Finch!

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Have we correctly identified all of the existing conditions that are important to you?

NO, we want Residents representations. Want to have a floor offered to the Community for **arts**, expression - Creative work by the residents - Meeting **S**pace - Theatre...

Following this Open House we will be assessing the potential effects of the facility on the local environment. Are there any environmental factors other than those presented tonight that you would like to see included in the assessment?

Clean Air + Clean Soil + Clean Water + OIL recycling outside of the community. Finch Ave and the GAS Truck?? What will happen??

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

We want as Residents living next to it be involve in the Design of the Complex in order to add ~~a~~ large Space for art Creativity and presentation.

Like the Daniel Spectrum Hub at Reagent Park by taking the largest empty space of the Community we

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Have we correctly identified all of the existing conditions that are important to you?

Yes, you have without question done your homework!

Following this Open House we will be assessing the potential effects of the facility on the local environment. Are there any environmental factors other than those presented tonight that you would like to see included in the assessment?

No, I believe you have them adequately covered.

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

You have been reasonable on this topic

If you would like to be added to the project mailing list, please give us your postal or email address (please print clearly):

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Have we correctly identified all of the existing conditions that are important to you?

YES

Following this Open House we will be assessing the potential effects of the facility on the local environment. Are there any environmental factors other than those presented tonight that you would like to see included in the assessment?

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

I WOULD WANT TO BE ASSURED THAT THE FACILITY WONT BE AN EYESORE AS WHEN I'M SITTING ON MY VERANDAH I'M FACING THE PROPOSED SITE. I HOPE SOME WALL WILL SURROUND THE SITE THAT DOES NOT LOOK UGLY.

ALSO IT WOULD BE GOOD IF ACCESS TO THE SITE IS NOT IN FRONT OF WEST FINCH AND ~~[illegible]~~ PELICAN GATE INTERSECTS AS THIS IS A RESIDENTIAL GATEWAY

If you would like to be added to the project mailing list, please give us your postal or email address (please print clearly):

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this is the BEST Thing that can happen to our community. I was planning to move but now there is hope

____

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Have we correctly identified all of the existing conditions that are important to you?

I think impact of the MSF was the focus. I believe how can MSF facility help to this community should be another point to discuss. In other words, positive impact should be assesed and discussed to help improve this community.

Following this Open House we will be assessing the potential effects of the facility on the local environment. Are there any environmental factors other than those presented tonight that you would like to see included in the assessment?

I believe environmental effects are well covered. However, socio-enviromental ~~impact~~ effects of taking a green space and replacing with a MSF should be assessed and analyzed.

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

I would like to see a hybrid building on the corner of J&F. I would like this facility to help improve the living standards of the neighbourhood. Therefore, I think a comittee for the design should be established. Community members shall definetly be part of this comittee. This will make sure that ~~MS~~ this facility turns into a community hub serving community and addressing their needs.

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Address: ____
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Phone #: ____

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Jane and Finch is a community with under funded centers. MSF is an opportunity to invest in the people of this community. I believe Metronlinx made the right decision by choosing this site. However, focus shall not only be providing a facility for Metrolinx. Community's needs should be assessed and consideration shall be given to satisfy these needs through the MSF. This can be managed by involving community members in design phase. Metrolinx should get together with the community groups to make sure that their voice is heard. I noticed the notification for thies consultation session by luck in the Metro Newspaper. I believe the outreach shall be done more locally to the people of this community. I am expecting a better and more effective outreach from Metrolinx for upcoming events. In addition, I strongly suggest that a committee involving public to be created to influence the design of the building.

#

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Have we correctly identified all of the existing conditions that are important to you?

Zoning not compatable. noise

Following this Open House we will be assessing the potential effects of the facility on the local environment. Are there any environmental factors other than those presented tonight that you would like to see included in the assessment?

I object baised on, 1/ not zoned for outside storage, 2/ noise & vibration
This facility would change the flavor of the neighbourhood.

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

This comunity need infrastructure to create comunity not a facility to create more problems.

If you would like to be added to the project mailing list, please give us your postal or email address (please print clearly):

Name: [redacted]
E-mail: [redacted]
Address: [redacted]
City: [redacted] **Postal Code:**
Phone #: [redacted]

COMMENT SHEET
Finch West Light Rail Transit (LRT)
July 9, 2014

We are currently in the preliminary planning stage for the Finch West LRT and would like to get your feedback.

Please submit your comments no later than July 23, 2014. A consultation report to inform the design team will be posted at www.metrolinx.com/finchwest Thank you.

Feedback

1. Do you have any comments about the preliminary alignment from Finch West to Humber College?

The Finch-West LRT as designed should service effectively many of the public transit needs of the residents of the north-west area of the city, It will reduce transit times for adult students attending Humber College and the high school students attending Westview Centennial, C.W. Jeffreys and Emery Collegiate in North York and North Albion and Father Henry Carr Secondary Schools in Etobicoke. It will also service the York-Finch Hospital and William Osler (Etobicoke) sites.

The capacity of the vehicles is significantly greater than which busses now provide. Removing busses from Finch, will enhance the flow of traffic.

U-Turns may be problematic in that they will necessitate a steep learning curve for some drivers and may marginally increase transit times. The truck-traffic issues seem to be overblown. It does make sense, however, to build truck access to the 400 via Steeles Ave. Only smaller delivery trucks should be permitted to service the retail businesses along Finch Ave. This may mitigate the need to construct an arterial road between Toryork and Finch.

The 400 and Finch interchange remains a bottleneck; special attention will have to be paid to this area so that traffic congestion isn’t worsened by the LRT – perhaps by an underground segment of the LRT.

All in all, the benefits of a paid-for LRT far outweigh the alternative of doing nothing and waiting for a subway which would not be cost-effective and probably would never be built..

Opposition to the LRT, principally is coming from small business who fear the unknown. The political debate has thus far heard only from the business sector. Metrolinx must ensure that the voices of residents who are public transit users are heard.

With respect to the Maintenance Facility for the LRT, the proposed location appears to be a good use of currently vacant land. However, a thorough study of the impact of working in close proximity to the hydro corridor must be undertaken so that the future health of transit employees is not compromised.

2. What do you consider most important to the neighbourhood as this project moves forward?

Moving public transit users more efficiently and reducing car and truck travel times.

General Project Feedback

Please use the 5-point scale to answer the follow questions:

	5 Agree	4 Agree somewhat	3 Disagree somewhat	2 Disagree	1 Unsure/not applicable
I have a good understanding of the Finch West LRT Project		X			
I am interested in learning more about the Finch West LRT Project	X				
I think the Finch West LRT Project will be good for my neighbourhood and good for Toronto	X				

Name (Optional) [redacted]

Address [redacted]

City [redacted] Postal Code [redacted]

E-Mail [redacted]

Telephone [redacted]

Please return your comments this evening, or by July 23, 2014 via e-mail, or post to:

Email: finchwest@metrolinx.com

Metrolinx –Rapid Transit Implementation
20 Bay Street
20th Floor
Toronto, ON M5J2W3

Blacha, Madelin

From:	Blacha, Madelin
Sent:	Monday, July 28, 2014 2:51 PM
To:	Blacha, Madelin
Subject:	FW: Maintenance & Storage Facility Finch West
Attachments:	72-DodgeBenefits_Owners_Archv2.pdf; 132-DodgeBenefits_GM_CM_v41.pdf

---

From: Finch West [mailto:FinchWest@metrolinx.com]
Sent: Monday, July 28, 2014 2:38 PM
To: Brutto, David
Subject: FW: Maintenance & Storage Facility Finch West

FYI

From: [redacted]
Sent: Monday, July 14, 2014 9:35 AM
To: Finch West
Subject: Maintenance & Storage Facility Finch West

Hello,

I am contacting you on behalf of McGraw-Hill, a news gathering and analytical service that tracks construction projects throughout Canada and the US for the primary benefit of industry trades to assist in the preparation of quotes and to ensure Building Product Manufacturers are aware of current and future demand for their products.

I am looking for a contact (name, phone, email) with regards to this project?

Thank-you, your assistance is greatly appreciated.

Regards,

[redacted]

www.construction.com (McGraw-Hill Construction/Dodge)
Upload plans at www.mghims.com
www.sweets.com - Free Building Product catalogue for Architects
MERX Private Construction — Add your project
For a brief overview of McGraw-Hill Construction/Dodge and how we serve the construction industry, please click: http://bit.ly/tAeTwM
201400581527

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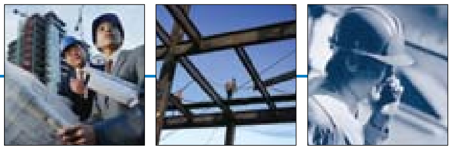

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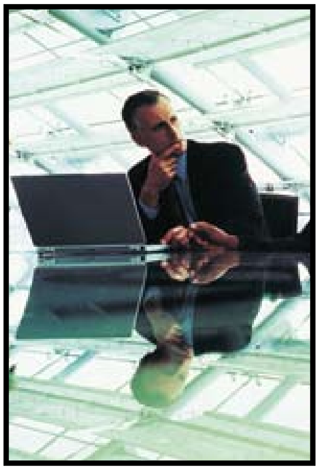

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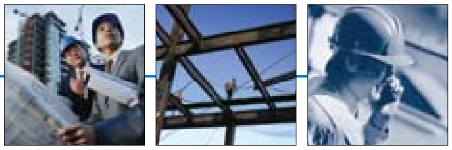

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1. Go to www.mghims.com
2. Enter User Name: mghp and Password: mghpmghp
3. Upload Your Files*

*Your documents will be in read-only format and are unalterable

Questions? Call: 800.393.6343

A3. Public Open House #1

Summary Report Appendix D
Agency Correspondence

From:	Pettigrew, Renee
Sent:	Thursday, July 17, 2014 10:29 AM
To:	Blacha, Madelin; Brutto, David
Subject:	AGENCY COMMENT FW: Finch West Maintenance and Storage Facility Environmental Assessment - City of Toronto - Notice of Public Open House
Follow Up Flag:	Follow up
Flag Status:	Flagged

From: David Veights [mailto:David.Veights@metrolinx.com]
Sent: Thursday, July 17, 2014 9:01 AM
To: ierullo@HydroOne.com
Cc: Tianyuan.Li@HydroOne.com; Les MacDermid; Morgan Rubes; Tania Baynova; Pettigrew, Renee
Subject: RE: Finch West Maintenance and Storage Facility Environmental Assessment - City of Toronto - Notice of Public Open House

Good morning Tony.

Thanks for the message.

The Finch West Maintenance and Storage Facility (MSF) will be located on lands owned by Metrolinx that are adjacent to the Hydro Corridor that is parallel to Finch Avenue. Hydro One received our notice by virtue of being an adjacent landowner.

The display panels that were presented at the Open House on July 9, 2014 are now posted on the project website and can be accessed by clicking the following link:

http://www.metrolinx.com/en/projectsandprograms/transitexpansionprojects/20140709_finch_west_open_house.aspx

The second set of panels (those toward the bottom of the webpage) focus on the MSF, the subject of our environmental assessment. Please refer to those panels for more information.

If you have any questions please feel free to contact me.

Thanks.

David Veights, AICP, PMP
Environmental Assessment Project Manager | Third Party, Utilities and Property | Rapid Transit Implementation
METROLINX | 5160 Yonge Street, Suite 300 | Toronto, Ontario| M2N 6L9
Direct Line: (416) 228-9339 | Fax: (416) 228-9272 | david.veights@metrolinx.com

---

From: ierullo@HydroOne.com [mailto:ierullo@HydroOne.com]
Sent: Monday, June 30, 2014 7:21 PM
To: David Veights
Cc: Tianyuan.Li@HydroOne.com

Subject: Re: Finch West Maintenance and Storage Facility Environmental Assessment - City of Toronto - Notice of Public Open House

Hi David,

Thank you very much for your email.

Please note that Hydro One has a strict policy on what can be constructed along the high voltage transmission rights of way.

If you are planning to construct your building (or any part of your building) on Hydro One corridor lands, it is very likely that your proposal will be met with strong opposition from Hydro One.

It may be helpful if you can send us some conceptual drawings so that we may provide our comments to you in writing.

To that end, can you please submit whatever plans you have to date to Tianyuan Li of Hydro One (she is copied on this email) so that she may provide you with an official response to your EA proposal.

Thanks, Tony

Sent from my BlackBerry 10 smartphone on the Bell network.

From: David Veights
Sent: Monday, June 30, 2014 1:30 PM
To: IERULLO Tony
Cc: Les MacDermid
Subject: Finch West Maintenance and Storage Facility Environmental Assessment - City of Toronto - Notice of Public Open House

Dear Mr. Tony Ierullo:

On behalf of Les MacDermid, P.Eng., Metrolinx Senior Project Manager for the Finch and Sheppard LRT Projects in the City of Toronto, I am sending you this notice to invite a representative of your organization to attend a Public Open House on July 9, 2014 regarding the Maintenance and Storage Facility (MSF) for the Finch West LRT.

The Project
Metrolinx has initiated preliminary planning for an Environmental Assessment (EA) Study under the Transit Project Assessment (TPA) Process for the construction and operation of a Maintenance and Storage Facility (MSF) for Finch West Light Rail Transit (LRT) System. The MSF is considered a necessary component of the Finch West LRT System that was subject to an EA conducted under the TPA Process in 2010; however the Environmental Project Report did not include the MSF. Accordingly, the EA for Finch West MSF site is now underway and will follow the TPA Process.

Process

The environmental impacts of this transit project will be assessed according to the TPA Process as prescribed in Ontario Regulation 231/08 made under the *Environmental Assessment Act*. As part of the TPA Process, an Environmental Project Report is being prepared.

Consultation

Public consultation is a vital component to this project. A Public Open House is being held to describe the purpose for the project, identify requirements of the new MSF, provide rationalization for site selection, and describe the existing conditions. Representatives from the project team will be available to answer questions and discuss the details of the study. Please refer to the attached Notice for additional details.

The Public Open House will be held as follows:

Date: Wednesday, July 9, 2014
Time: 7:00 PM to 9:00 PM
Location: Julius Banquet Centre (2201 Finch Avenue West)

If you require additional information, please contact David Veights, Environmental Assessment Project Manager, at david.veights@metrolinx.com. Comments may also be submitted on our project website at www.metrolinx.com/finchwest or through our project e-mail address at finchwest@metrolinx.com.

Thank you for your interest in this important transit investment in the City of Toronto.

Sincerely,

David Veights, AICP, PMP
Environmental Assessment Project Manager | Third Party, Utilities and Property | Rapid Transit Implementation
METROLINX | 5160 Yonge Street, Suite 300 | Toronto, Ontario| M2N 6L9
Direct Line: (416) 228-9339 | Fax: (416) 228-9272 | david.veights@metrolinx.com

Attachment

Blacha, Madelin

From:	Blacha, Madelin
Sent:	Thursday, July 24, 2014 10:36 AM
To:	Blacha, Madelin
Subject:	FW: Metrolinx Finch West MSF - Endangered Species

From: Gaspardy, Geza
Sent: Wednesday, July 23, 2014 2:36 PM
To: Burkart, Jackie (MNR)
Cc: ESA Aurora (MNR); Pettigrew, Renee; Amirsalari, Faranak
Subject: RE: Metrolinx Finch West MSF - Endangered Species

ESA Aurora

Following up on the email exchange below dated 2 July 2014 would you please advise of the status of the next steps required for this project with respect to the documented observation of eastern meadowlark at the project site located on the north side of Finch Ave. between Jane St. and Highway 400 in the City of Toronot?

Thank you for your earliest advice.

Géza

Géza Gáspárdy, MCIP, RPP
Senior Ecologist, Environment
D 905-747-7842   C 647.233.8858
Geza.Gaspardy@aecom.com

AECOM
105 Commerce Valley Drive West
Markham, Ontario, Canada L3T 7W3
T 905-886-7022 F 905-886-9494
www.aecom.com

From: Burkart, Jackie (MNR) [mailto:Jackie.Burkart@ontario.ca]
Sent: Wednesday, July 02, 2014 1:30 PM
To: Gaspardy, Geza
Cc: ESA Aurora (MNR)
Subject: RE: Metrolinx Finch West MSF - Endangered Species

Thanks for this information Geza. By copy of this email to ESA Aurora, I will pass it along to our SAR folk in the office. They will advise as to next steps.

Jackie

Jackie Burkart
District Planner
Ministry of Natural Resources | 50 Bloomington Road, Aurora, ON L4G 0L8 | Phone: 905-713-7368 | Fax: 905-713-7360 | Email: jackie.burkart@ontario.ca |

From: Gaspardy, Geza [mailto:Geza.Gaspardy@aecom.com]
Sent: July 2, 2014 11:44 AM
To: Burkart, Jackie (MNR)
Cc: Adrian.pereira@ontario.ca; David Veights; Les MacDermid (les.macdermid@metrolinx.com); Pettigrew, Renee
Subject: Metrolinx Finch West MSF - Endangered Species

Ms Burkhart

Following up on AECOM's information request with respect to the Metrolinx Finch West Maintenance and Storage Facility study, AECOM has completed terrestrial inventories for the property. Please accept this notice as informal advice of the observation of Eastern Meadowlark, a Threatened species per the Endangered Species Act 2007. A formal notice per Ontario Regulation 242/06 will be submitted in short order once Metrolinx and Infrastructure Ontario determine their respective responsibilities in this regard.

AECOM ecologists conducted three (3) breeding bird surveys on the subject site between the end of May and the middle of June 2014. Several bird species common to undeveloped urban areas (Redwinged Blackbird, killdeer, American Robin, Song Sparrow, Mallard, amongst others) were documented nesting on site. On the first visit a single Eastern Meadowlark was also observed near the centre of the property, perched on a young white elm and singing. On approach, the bird flew to the southeast portion of the property and landed. The individual was not observed again on that date. On the following visit two (2) Eastern Meadowlark were observed near the same elm perch and on extended observation were several times observed to return to a site on the ground in the centre of the westerly portion of the property. On the third visit, one week later, NO Eastern Meadowlark was observed during a survey of similar magnitude and extent on site.

No further inventory has been completed at this site.

We have advised our client, Metrolinx and their partner Infrastructure Ontario, of the reporting requirement under O'Reg 242/06. This informal advice to you is provided in advance of a Public Open House scheduled for Thursday 9 July 2014 at which time the public will be advised only that a Listed Species was documented on site.

Please contact me at your convenience should you have immediate questions or comments in this regard. Again, as noted above, the formal notification of these observations will be provided in short order.

Géza

Géza Gáspárdy, MCIP, RPP
Senior Ecologist, Environment
D 905-747-7842 C 647.233.8858
Geza.Gaspardy@aecom.com

AECOM

105 Commerce Valley Drive West
Markham, Ontario, Canada L3T 7W3
T 905-886-7022 F 905-886-9494
www.aecom.com

From:	Blacha, Madelin
Sent:	Thursday, July 24, 2014 2:35 PM
To:	Blacha, Madelin
Subject:	FW: TRCA Response to PIC #1 for Finch West LRT Maintenance and Storage Facility (MSF)
Attachments:	40840_MSF PIC TRCA Response_July 2014.pdf; FW: Correction -Re: TRCA Response to PIC #1 for Finch West LRT Maintenance and Storage Facility (MSF)

From: Annette Maher [mailto:AMaher@trca.on.ca]
Sent: Tuesday, July 15, 2014 12:36 PM
To: David Veights
Cc: Finch West; Renee Afoom-Boateng
Subject: TRCA Response to PIC #1 for Finch West LRT Maintenance and Storage Facility (MSF)

Hello David,

Please see the attached letter for TRCA's response to the Public Information Centre meeting on July 9, 2014.

Should you have any questions, please do not hesitate to contact me or my colleague Renee Afoom-Boateng at extension 5714 or at rafoom-boateng@trca.on.ca.

Thank you,
Annette

Annette Maher, M.A.Sc.
Planner I
Environmental Assessment Planning
Planning and Development
Toronto and Region Conservation Authority
5 Shoreham Drive | Toronto, ON M3N 1S4
☎416.661.6600 x5798 | ✉amaher@trca.on.ca

Toronto and Region
Conservation
for The Living City

July 9, 2014

CFN 40840

BY E-MAIL ONLY (david.veights@metrolinx.com)

Mr. David Veights
Metrolinx
Environmental Assessment Project Manager
5160 Yonge Street, Suite 300
Toronto ON M2N 6L9

Dear Mr. Veights:

Re: Response to Notice of Public Information Centre #1
Finch West Light Rail Transit Project (LRT): Maintenance and Storage Facility (MSF)
Humber River Watershed; City of Toronto (North York Community Council Area)

Toronto and Region Conservation Authority (TRCA) staff received notice of the upcoming Public Information Centre (PIC) scheduled for Wednesday, July 9, 2014.

Staff has reviewed the study area associated with the Finch West LRT MSF and advises that there are no TRCA areas of interest within the identified study limits. As such, staff has no concerns with the project. Please remove TRCA staff from the project mailing list. If the nature or scope of the study changes, please contact staff to confirm TRCA interests.

Should you have any questions, please contact me at extension 5714 or at rafoom-boateng@trca.on.ca.

Yours truly,

Renee Afoom Boateng

Renee Afoom-Boateng
Senior Planner, Environmental Assessment Planning
Planning and Development

/AM

From: Tania Baynova <Tania.Baynova@metrolinx.com>
Sent: Thursday, July 24, 2014 2:07 PM
To: Brutto, David
Cc: Pettigrew, Renee; David Veights
Subject: FW: Correction -Re: TRCA Response to PIC #1 for Finch West LRT Maintenance and Storage Facility (MSF)

FYI

From: Renee Afoom-Boateng [mailto:RAfoom-Boateng@trca.on.ca]
Sent: Tuesday, July 15, 2014 2:15 PM
To: David Veights; Finch West
Cc: Annette Maher
Subject: Correction -Re: TRCA Response to PIC #1 for Finch West LRT Maintenance and Storage Facility (MSF)

Hi David
Just to clarify/correct the email and PIC response letter below; as discussed over the phone a few weeks ago, although the Finch West LRT MSF site is not regulated by TRCA (no areas of interest), please continue to keep TRCA staff (myself) in the loop - continue sending us updates and notices like we discussed.
Thanks Renee

Renee Afoom-Boateng, MES, MCIP, RPP
Senior Planner, Environmental Assessment Planning
TRCA, 5 Shoreham Drive, Downsview, ON M3N 1S4
Tel: 416-661-6600 ext. 5714
Email: rafoom-boateng@trca.on.ca

From: Annette Maher/TRCA
To: david.veights@metrolinx.com,
Cc: finchwest@metrolinx.com, Renee Afoom-Boateng/TRCA@MTRCA
Date: 07/15/2014 12:36 PM
Subject: TRCA Response to PIC #1 for Finch West LRT Maintenance and Storage Facility (MSF)

Hello David,

Please see the attached letter for TRCA's response to the Public Information Centre meeting on July 9, 2014.

Should you have any questions, please do not hesitate to contact me or my colleague Renee Afoom-Boateng at extension 5714 or at rafoom-boateng@trca.on.ca.

Thank you,
Annette

[attachment "40840_MSF PIC TRCA Response_July 2014.pdf" deleted by Renee Afoom-Boateng/TRCA]

Annette Maher, M.A.Sc.
Planner I
Environmental Assessment Planning

Planning and Development
Toronto and Region Conservation Authority
5 Shoreham Drive | Toronto, ON M3N 1S4
☎416.661.6600 x5798 | ✉amaher@trca.on.ca

From: Blacha, Madelin
Sent: Thursday, July 24, 2014 10:42 AM
To: Blacha, Madelin
Subject: FW: Metrolinx Finch West MSF - Endangered Species

From: Gaspardy, Geza
Sent: Wednesday, July 23, 2014 5:28 PM
To: ESA Aurora (MNR)
Cc: Pettigrew, Renee; Amirsalari, Faranak
Subject: RE: Metrolinx Finch West MSF - Endangered Species

Thank you Natosha

The AECOM EA team will review the Information Gathering Form requirements and O'Reg 242/08 with the client and proceed accordingly.

Many thanks.

Géza

Géza Gáspárdy, MCIP, RPP
Senior Ecologist, Environment
D 905-747-7842 C 647.233.8858
Geza.Gaspardy@aecom.com

AECOM
105 Commerce Valley Drive West
Markham, Ontario, Canada L3T 7W3
T 905-886-7022 F 905-886-9494
www.aecom.com

From: ESA Aurora (MNR) [mailto:ESA.Aurora@ontario.ca]
Sent: Wednesday, July 23, 2014 4:39 PM
To: Gaspardy, Geza
Subject: RE: Metrolinx Finch West MSF - Endangered Species

Hello Geza,

As per section 23.6 of Ontario Regulation 242/08, if the activity will damage or destroy less than or equal to 30 hectares of Eastern Meadowlark habitat AND the proponent is willing and able to follow all of the rules set out in regulation, then the proponent may be eligible to register the activity.

If the activity will damage or destroy more than 30 ha of habitat or the proponent is not willing or able to follow the rules in regulation, a 17(2)(c) permit would be required under the *Endangered Species Act, 2007* to damage or destroy Eastern Meadowlark habitat. The first step in this process would be to fill out an IGF and submit it to esa.aurora@ontario.ca.

When determining the amount of habitat to be impacted, please note that Eastern Meadowlark habitat includes the entire area of suitable, contiguous habitat that is separated by less than 20 metres of unsuitable habitat. For example, observing Eastern Meadowlark displaying probable breeding behaviour in a 1 hectare subsection of a 10 ha meadow of suitable, contiguous habitat, would mean that the entire 10 ha patch of habitat would be categorized as habitat.

Hope that answers your question.

Sincerely,

Natosha

Natosha Fortini
Fish and Wildlife Technical Specialist
Aurora District - OMNRF

From: Gaspardy, Geza [mailto:Geza.Gaspardy@aecom.com]
Sent: July 23, 2014 4:09 PM
To: ESA Aurora (MNR)
Cc: Pettigrew, Renee; Amirsalari, Faranak; Burkart, Jackie (MNR)
Subject: RE: Metrolinx Finch West MSF - Endangered Species

Good afternoon, Natosha

AECOM is completing a specialized EA process on behalf of MetroLinx for a Maintenance and Storage Facility (MSF) at this site for the Finch West LRT. As noted in the email we advised Ms Jackie Burkhart of our observations of Eastern Meadowlark (EAME) at this location. The proposed MSF would occupy the entire property resulting in the removal of the limited EAME habitat at this location. Please confirm the next steps required to proceed toward completion of the current specialized EA which will lead to a design build contract on behalf of MetroLinx. Only conceptual layouts of the MSF have been prepared but all require use of the entire property.

We anticipate requirement for compensation habitat but require MNR guidance as to the appropriate procedure, timing requirements etc. We are familiar with the EAME habitat compensation mechanisms, design requirements, documentation etc. per Ontario Regulation 242-08 under the *Endangered Species Act 2007*.

No, MNR has not previously requested additional information because the EAME report to MNR was completed only on 2 July 2014, per my email to Ms Burkhart. Yes, I had requested a SAR screening at the outset of our EA process some months ago and received advice that NO SAR were documented in this vicinity. Our detailed field investigation identified the EAME on site.

Thank you for your earliest advice and guidance.

Géza

Géza Gáspárdy, MCIP, RPP

Senior Ecologist, Environment
D 905-747-7842   C 647.233.8858
Geza.Gaspardy@aecom.com

AECOM
105 Commerce Valley Drive West
Markham, Ontario, Canada L3T 7W3
T 905-886-7022 F 905-886-9494
www.aecom.com

From: ESA Aurora (MNR) [mailto:ESA.Aurora@ontario.ca]
Sent: Wednesday, July 23, 2014 3:37 PM
To: Gaspardy, Geza
Subject: RE: Metrolinx Finch West MSF - Endangered Species

Hello Geza,

I am unsure of what you are asking. There are a number of different authorizations which could be applicable to works impacting Eastern Meadowlark and/or its habitat. I cannot provide more guidance without having additional details about the proposed development and potential species at risk concerns.

I have looked in our database and have not found a file for this project. Have you requested a species at risk screening for the project area? Has MNRF previously requested additional information on the proposed development?

Sincerely,

Natosha

Natosha Fortini
Fish & Wildlife Technical Specialist | Aurora District | Ontario Ministry of Natural Resources and Forestry | 50 Bloomington Rd. W., Aurora, ON, L4G 0L8 | PH: 905.713.7394 | F: 905.713.7361 | natosha.fortini@ontario.ca

* please note the change in my phone number

In order to serve you better, please call ahead to make an appointment

---

From: Gaspardy, Geza [mailto:Geza.Gaspardy@aecom.com]
Sent: July 23, 2014 2:36 PM
To: Burkart, Jackie (MNR)
Cc: ESA Aurora (MNR); Pettigrew, Renee; Amirsalari, Faranak
Subject: RE: Metrolinx Finch West MSF - Endangered Species

ESA Aurora

Following up on the email exchange below dated 2 July 2014 would you please advise of the status of the next steps required for this project with respect to the documented observation of eastern meadowlark at the project site located on the north side of Finch Ave. between Jane St. and Highway 400 in the City of Toronot?

Thank you for your earliest advice.

Géza

Géza Gáspárdy, MCIP, RPP
Senior Ecologist, Environment
D 905-747-7842 C 647.233.8858
Geza.Gaspardy@aecom.com

105 Commerce Valley Drive West
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T 905-886-7022 F 905-886-9494
www.aecom.com

From: Burkart, Jackie (MNR) [mailto:Jackie.Burkart@ontario.ca]
Sent: Wednesday, July 02, 2014 1:30 PM
To: Gaspardy, Geza
Cc: ESA Aurora (MNR)
Subject: RE: Metrolinx Finch West MSF - Endangered Species

Thanks for this information Geza. By copy of this email to ESA Aurora, I will pass it along to our SAR folk in the office. They will advise as to next steps.

Jackie

Jackie Burkart
District Planner
Ministry of Natural Resources | 50 Bloomington Road, Aurora, ON L4G 0L8 | Phone: 905-713-7368 | Fax: 905-713-7360 | Email: jackie.burkart@ontario.ca |

From: Gaspardy, Geza [mailto:Geza.Gaspardy@aecom.com]
Sent: July 2, 2014 11:44 AM
To: Burkart, Jackie (MNR)
Cc: Adrian.pereira@ontario.ca; David Veights; Les MacDermid (les.macdermid@metrolinx.com); Pettigrew, Renee
Subject: Metrolinx Finch West MSF - Endangered Species

Ms Burkhart

Following up on AECOM's information request with respect to the Metrolinx Finch West Maintenance and Storage Facility study, AECOM has completed terrestrial inventories for the property. Please accept this notice as informal advice of the observation of Eastern Meadowlark, a Threatened species per the Endangered Species Act 2007. A formal notice per Ontario Regulation 242/06 will be submitted in short order once Metrolinx and Infrastructure Ontario determine their respective responsibilities in this regard.

AECOM ecologists conducted three (3) breeding bird surveys on the subject site between the end of May and the middle of June 2014. Several bird species common to undeveloped urban areas (Redwinged Blackbird, killdeer, American Robin, Song Sparrow, Mallard, amongst others) were documented nesting on site. On the first visit a single Eastern Meadowlark was also observed near the centre of the property, perched on a young white elm and singing. On approach, the bird flew to the southeast portion of the property and landed. The individual was not observed again on that date. On the following visit two (2) Eastern Meadowlark were observed near the same elm perch and on extended observation were several times observed to return to a site on the ground in the centre of the westerly portion of the property. On the third visit, one week later, NO Eastern Meadowlark was observed during a survey of similar magnitude and extent on site.

No further inventory has been completed at this site.

We have advised our client, Metrolinx and their partner Infrastructure Ontario, of the reporting requirement under O'Reg 242/06. This informal advice to you is provided in advance of a Public Open House scheduled for Thursday 9 July 2014 at which time the public will be advised only that a Listed Species was documented on site.

Please contact me at your convenience should you have immediate questions or comments in this regard. Again, as noted above, the formal notification of these observations will be provided in short order.

Géza

Géza Gáspárdy, MCIP, RPP
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A4. Public Open House #2

Metrolinx

Finch West Light Rail Maintenance and Storage Facility Environmental Assessment Public Open House #2 Summary Report

Prepared by:

AECOM
5080 Commerce Boulevard **905 238 0007 tel**
Mississauga, ON, Canada L4W 4P2 **905 238 0038 fax**
www.aecom.com

Project Number:

60318592

Date:

July 2015

AECOM Signatures

Report Prepared By:

Madelin Blacha, B.U.R.Pl.
Environmental Planner

Report Reviewed By:

Faranak Amirsalari, MES, MCIP, RPP
Environmental Planner

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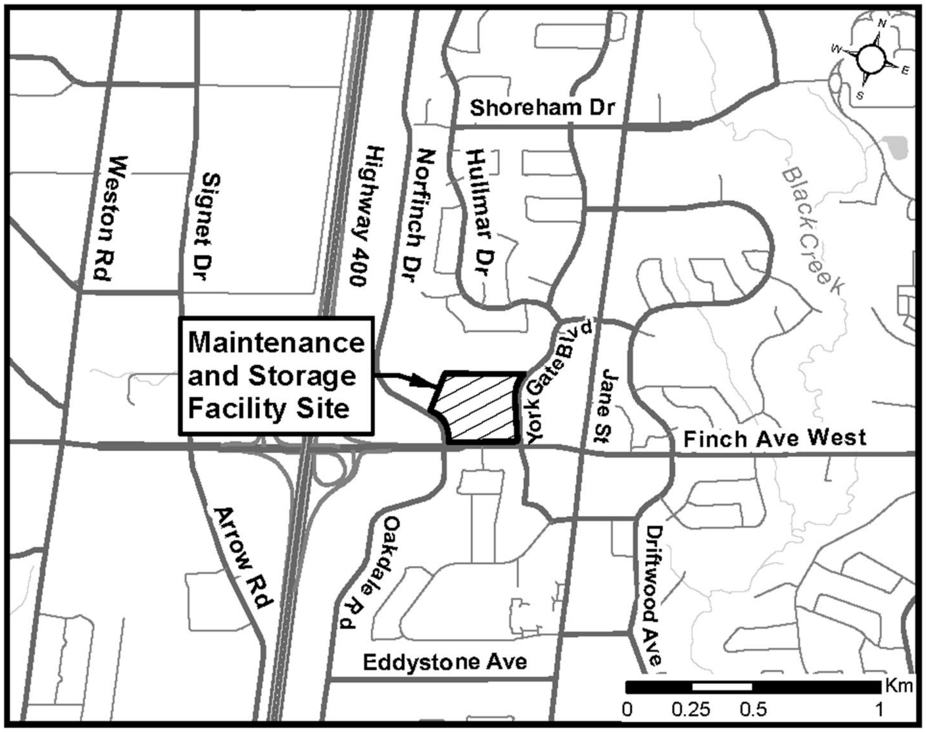
Appendices

1. Introduction

In March 2010, the Toronto Transit Commission (TTC) and City of Toronto completed a Transit Project Assessment Process (TPAP) study as prescribed in Ontario Regulation 231/08 made under the *Environmental Assessment Act*, for the Etobicoke-Finch West Light Rail Transit corridor (Finch West LRT). The LRT service supports existing and future ridership demands and provides economic benefit to neighbourhoods.

A Maintenance and Storage Facility (MSF) is a component of the transit corridor that will provide maintenance and storage capacity for Light Rail Vehicles (LRVs) servicing the Finch West LRT System. The MSF is considered a necessary component of the Finch West LRT System; however the Environmental Project Report for the Finch West LRT did not include the MSF. Accordingly, a study is being conducted by Metrolinx to document the TPAP for the Finch West MSF. The MSF is located along Finch Avenue West, just east of Highway 400 and west of Jane Street (**Figure 1-1**). The site is currently a vacant lot owned by Metrolinx.

Figure 1-1: Finch West MSF Site



The purpose of the Finch West MSF is to provide maintenance service and storage tracks for overnight storage of the new Light Rail Vehicles (LRVs) servicing the Finch West LRT system, and a main repair shop facility to maintain the new LRVs in a state of good repair. The Project is required to facilitate the enhancement of transit service for the community that will be provided through implementation of the Finch West LRT.

Public Open House (POH) #2 was held as a component of the TPAP to present the preferred design for the MSF and results of the environmental impact assessment and receive comments on the proposed mitigation measures. The POH was held in an open house format where representatives from the Project Team were available to answer questions and discuss the details of the study.

2. Notice of Public Open House #2

2.1 Notice via Newspaper

The Notice of POH #2 was published in the following newspapers:

- *North York Mirror* on June 11, 2015 and June 18, 2015
- *Downsview Advocate* on June 15, 2015
- *Metro News Toronto* on June 17, 2015 and June 22, 2015
- *24 Hours Toronto* on June 17, 2015 and June 22, 2015

The newspaper advertisements provided residents and stakeholders with information on how to participate actively in the study through the planned POH.

The Notice of POH was also posted on the project website (www.metrolinx.com/finchwest) and can be found in **Appendix A.**

2.2 Notice via Canada Post Mail-out

Property owners within 30 metres of the MSF site were sent Notice through addressed mail from Canada Post on June 5, 2015. In addition, unaddressed mail was sent to all residents and businesses within 500 metres of the MSF site on June 11, 2015 notifying them of POH #2.

2.3 Notice to Stakeholders

Federal Agencies, Provincial Agencies, and Aboriginal communities were provided with the Notice of POH #2 via e-mail on June 5, 2015.

2.3.1 Federal Agencies

The following Federal Agencies received the notice:

- Aboriginal Affairs and Northern Development Canada

2.3.2 Provincial Agencies

The following Ontario Government Agencies received the notice:

- Hydro One Networks Inc.
- Ministry of Aboriginal Affairs
- Ministry of the Environment and Climate Change
- Ministry of Municipal Affairs and Housing
- Ministry of Natural Resources and Forestry
- Ministry of Tourism, Culture and Sport
- Ontario Provincial Police
- Toronto and Region Conservation Authority

2.3.3 Aboriginal Communities

The following Aboriginal communities received the notice:

- Alderville First Nation
- Beausoleil First Nation
- Chippewas of Georgina Island
- Chippewas of Mnjikaning (Rama)
- Curve Lake First Nation
- Hiawatha First Nation
- Huron-Wendat First Nation
- Kawartha Nishwabe First Nations
- Métis Nation of Ontario
- Mississaugas of Scugog Island First Nation

2.4 Notice to Elected Officials

The following elected officials were also directly notified of the study and were briefed prior to the POH date:

- Councillor Vincent Crisanti (Ward 1) on June 5, 2015
- Councillor Giorgio Mammoliti (Ward 7) on June 12, 2015
- Councillor Anthony Perruzza (Ward 8) on May 29, 2015
- Mario Sergio, MPP (York West) on June 12, 2015
- Shafiq Qaadri, MPP (Etobicoke-North) was unable to schedule

3. Public Open House

The POH was an open house format where members of the project team were available to answer questions and address concerns. The session was held as follows:

Date: Wednesday, June 24, 2015
Time: 7:00 pm to 9:00 pm
Location: St. Wilfrid Catholic School Gym
1685 Finch Avenue West

Approximately 75 individuals attended the POH according to the sign-in sheet. Members of the Project Team were available to facilitate the understanding of information presented including the TPAP.

The materials presented at POH #2 were made available online at the project website (www.metrolinx.com/finchwest). Online comments submitted to the project email until July 8, 2015.

4. Information Presented

Display panels were organized in a manner which effectively presented information on the project.
The display panels are outlined below and can be viewed in full in **Appendix B**.

- **Welcome to the Open House**
- **Purpose of Tonight's Open House**

- **Finch West LRT Maintenance and Storage Facility**
- **Finch West LRT MSF Environmental Assessment**
- **MSF Planning and Development Framework**
- **Recap of Public Open House #1**
- **Preferred Conceptual Design for the MSF**
- **Effects Assessment Process**
- **Natural Environment – Potential Effects & Mitigation**
- **Noise – Potential Effects & Mitigation**
- **Vibration – Potential Effects & Mitigation**
- **Air Quality – Potential Effects & Mitigation**
- **Transportation – Potential Effects & Mitigation**
- **Other Mitigation Measures During Construction**
- **Other Mitigation Measures During Operations and Maintenance**
- **Commitments to Future Work**
- **Consultation Process Timelines**
- **What Happens Next?**
- **Thank You**

In addition to the display panels above, Metrolinx also presented information and solicited input regarding the Finch West LRT corridor.

5. Comments from the Public

This section provides a summary of the comments received based on the questions that were asked in the provided comment sheets. The comments received that were determined to directly correlate to the Finch LRT Corridor (and showed no correlation to the MSF EA study) are excluded from this section. Those who provided contact information were added to the project contact list to receive future notifications relating to the study.

In total, 10 comment sheets were completed and submitted to the project team during and after the POH. In addition, 6 comments were received through online consultation. All comment sheets and correspondence received is available in **Appendix C**.

5.1 Comments Received at Public Open House #2

The following comments are recorded and organized from the 16 comment sheets received during POH #2 on June 24, 2015.

Do you have any comments on the preferred conceptual design of the Maintenance and Storage Facility?

Comments received for this question were categorized by the following topics:

Suggested Design Features (4)

- The LRT corridor should improve the urban street edge whereas the preferred conceptual design illustrates a suburban street edge condition (i.e. parking lot along Finch).
- Green roof please! Reduced parking lot at front to improve pedestrian experience.
- Would be good to take same design principles used in the new Leslie Barns to animate the surrounding streets and draw positive attention to an otherwise noisy and drab facility i.e. green roof, attractive murals and LRT inspired artworks.

- The stormwater pond should not be fenced off. It should be designed to be an accessible design feature.

Mixed-Use Opportunity (3)

- There is no space along Finch Ave for a multi-purpose facility or Arts Centre.
- It should include a mixed-use component as part of the program.
- The entire Finch frontage needs to be 3-storey commercial. There should be no surface level parking.

Community Integration (4)

- What do the residents get from this build? Most important to design the space with a community benefit e.g. facilities for residents to use.
- It is a very bad idea. If this is the way you want to improve the Jane and Finch area by building a garage on prime land?
- Do we need this Facility in the Jane-Finch community? Are there other sites that would be a better choice? The area needs to improve. I do not think an MSF for LRT is an area betterment. I always thought that corner property would have been better served the community with new condos and commercial/retail stores, much like they are building along Wilson east of the subway.
- Jane-Finch is notorious for teens having guns and shooting each other. The Maintenance and Storage Facility should have lots of monitoring cameras (that can see if it is dark) to discourage the Facility from becoming a killing field.

Traffic Concerns (2)

- I believe that cars will still be the needed mode of transport for most people. Trucks are needed for delivery of goods and they need easy traffic lanes. The concept may be OK for now but in 2 or 3 decades from now there will be regret not to have improved roads and done a subway. In the long run it would have been cheaper to use and maintain.
- What effect will this have on traffic? Traffic congestion with heavy gas trucks, etc. using Finch. I can only see it getting worse.

Do you have any comments on the potential effects and mitigation measures identified?

Comments received for this question were categorized by the following topics:

Traffic Concerns (1)

- My concern is that the left turn signals into residential streets should have advanced green at those intersections.

LRT Related (2)

- At the intersections there should be no raised platforms that would prevent exist or entry to/from residential streets.
- I heard from a City Councillor that now there are not enough people for a subway. Toronto has a long winter and people need stations to repair from weather, cold and car splash. Did not see any in the “concept”. A previous Concept “beautiful” as it seemed turned out a disaster “St. Clair”. My experience is that “studies” have always been far from reality but good luck. I can always move.

Other (2)

- No. No. No for a Garage on Jane and Finch.
- What is going to happen during large snow falls? Is there going to be coordination between the City and Metrolinx on snow removal? 2 times Finch has been washed out and closed (once for 8 months near this school). Bombardier has not been able to fulfill their current streetcar commitment. How can they be trusted in the future? How can the incredibly poor planning, such as the 6 inch height, be avoided? Why are there no penalties (preferably criminal) for such ineptitude!

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

Comments received in this section of the comment sheet were categorized by the following topics:

Indicated Support (1)

- Good place to put it. Hope less apartments will go there in that area to clog the traffic.

Suggested Design Features (3)

- The separate multi-use path should be a bit bigger.
- Improve the built form along Finch.
- Would be a good idea to add a curb between proposed bike lane and vehicular traffic for added safety measures.

Mixed-Use Opportunity (1)

- Perhaps could use affordable housing to support LRT ridership. Business type commercial uses.

Community Integration (2)

- How can the Build support the hundreds of kids who play soccer on the hydro lands? Build some bleachers? How are you going to ensure the Jane-Finch residents benefit from this build instead of another build that is imposed on the community? There is an opportunity here for improvements that will enhance Jane-Finch. Let's make it happen!
- Improve community engagement by delivering a program that improves existing context.

Traffic Concerns (1)

- What about the intersection of Finch and Highway 400?

LRT Related (1)

- Why isn't the whole thing, including the LRT, underground? The Eglinton line has portions underground. This increases an issue with north-south traffic flow dividing neighbourhoods and making deliveries difficult. It creates a "wrong side of the track" scenario where bad neighbourhoods are isolated and contained and a virtual moat around the city. Why not use the power line right-of-way instead of usable property?

Other (2)

- No garage on Jane and Finch.
- Feel this project was put through without input from area residents.

5.2 Comments Received through Project Email

The following 6 comments were received to the project email following the issuance of Notice of POH #2:

- June 11, 2015: Inquired re: zoning amendment for MSF site. Expressed preference for residential land use.
- June 12, 2015: Suggested considering use of hydro line corridor (north of MSF site) to avoid traffic disruptions.
- June 16, 2015: Requested more information about the project. Expressed potential noise concerns.
- June 25, 2015: Requested informed about future open houses.
- June 27, 2015: Inquired re: pre-engineered building design for the MSF.
- June 30, 2015: Noted duplication of LRT presentation materials on project website.

6. Comments from External Agencies

All correspondence received from external agencies is documented in **Appendix D**.

6.1 Federal and Provincial Agencies

Comments were received from Hydro One Networks Inc. (Hydro One) and Toronto and Region Conservation Authority (TRCA) in response to Notice of Commencement below.

Hydro One sent an email response to the Notice of Commencement, confirming that there are no Hydro One Transmission (above 115 kV) Facilities in the subject area based on initial review and requested the Environmental Project Report be shared once completed.

TRCA sent an email response to the Notice of Commencement, confirming that there are no TRCA areas of interest within the identified study limits, and therefore no concerns with the MSF project.

6.2 Aboriginal Communities

Hiawatha First Nation sent an email response to the Notice of Commencement, confirming that the proposed MSF will have little, if any, impact on Hiawatha First Nation's traditional territory and/or rights.

6.3 Elected Officials

Councillor Perruzza and MPP Sergio attended POH #2. In addition, staff representatives of MP Sgro, MPP Sergio, and Councillor Mammoliti were in attendance.

A4. Public Open House #2

Summary Report Appendix A
Notice of Public Open House #2

METROLINX
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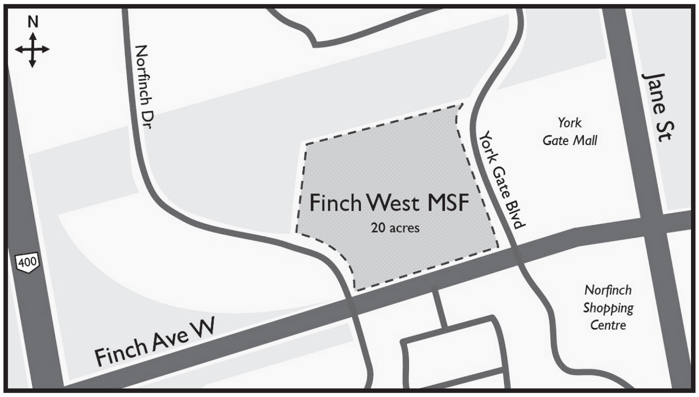
Public Open House:

Finch West Light Rail Transit (LRT) Project

Maintenance and Storage Facility

The Finch West LRT project will add 11 kilometres of new rapid transit along Finch Avenue from the planned Finch West subway station at Keele Street to Humber College. The new service will provide improved, faster and reliable transit.

Metrolinx is undertaking an Environmental Assessment (EA) for a Maintenance and Storage Facility (MSF) to support the Finch West LRT line. The location of the MSF is a vacant property on Finch Avenue West between Norfinch Drive and York Gate Boulevard. A Notice of Commencement was issued on May 15, 2015.



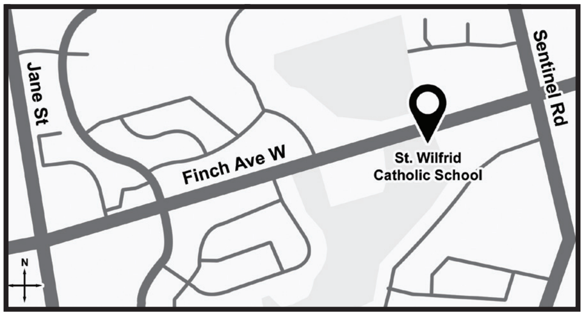
Metrolinx invites you to attend a public open house to learn about plans for the MSF, the potential environmental impacts of the MSF, and the recommended measures to mitigate any effects identified through our planning activities.

At this public information meeting, Metrolinx will:

- Provide an overview of the Finch West LRT project
- Re-introduce the MSF project
- Present the preferred design concept for the MSF
- Present the environmental impact assessment results
- Seek comments on the proposed mitigation measures

The meeting will provide an opportunity to view displays, submit comments and speak one-on-one with staff.

Date: Wednesday June 24, 2015
Time: 7:00 p.m. to 9:00 p.m.
Location: St. Wilfrid Catholic School Gym
Address: 1685 Finch Avenue West



For more information:

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email: finchwest@metrolinx.com
web: www.metrolinx.com/finchwest

Tel: 416-869-3600 Ext 5739
TTY: 1-800-387-3652

A4. Public Open House #2

Summary Report Appendix B
Display Panels

FINCH WEST LIGHT RAIL TRANSIT MAINTENANCE AND STORAGE FACILITY ENVIRONMENTAL ASSESSMENT

PUBLIC OPEN HOUSE #2

June 24, 2015 | St. Wilfrid Catholic School
1685 Finch Avenue West
7:00 p.m. to 9:00 p.m.

METROLINX
An agency of the Government of Ontario

Welcome to the Open House

Finch West Light Rail Transit (LRT) Maintenance and Storage Facility (MSF) Environmental Assessment

Please sign-in.

Comment sheets are available

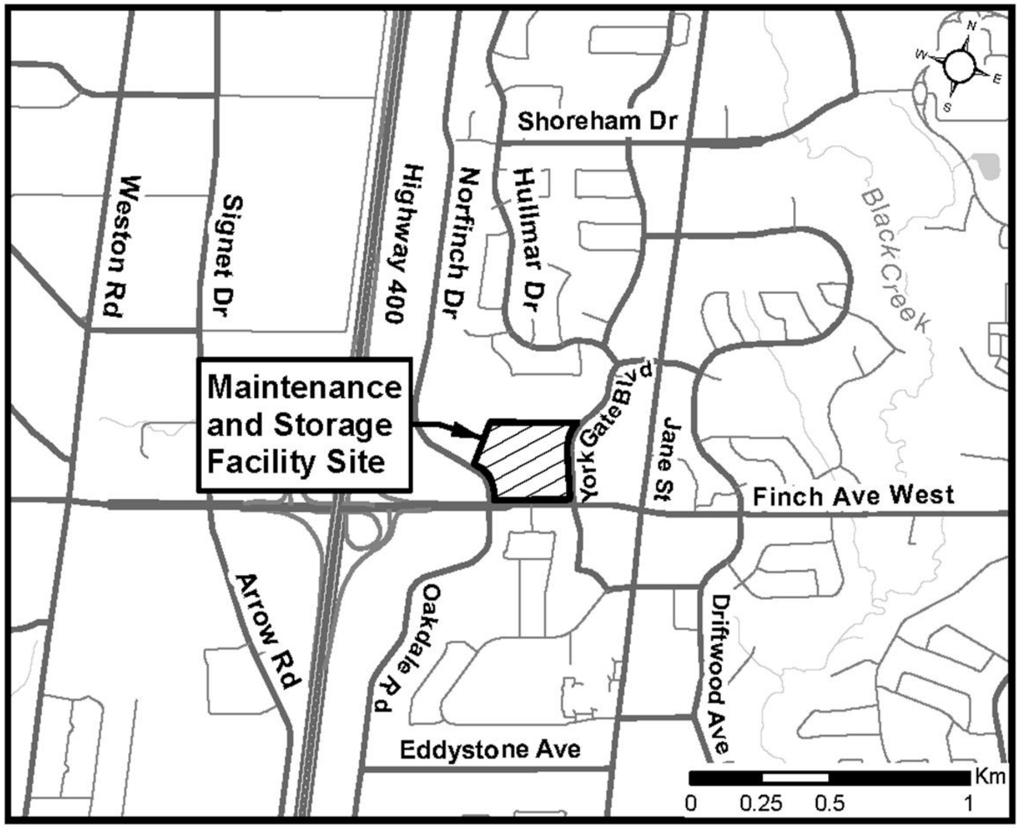
- E-mail: finchwest@metrolinx.com
- Online: www.metrolinx.com/finchwest

Purpose of Tonight's Open House

- Introduce Preferred MSF Conceptual Design
- Present required mitigation measures and monitoring to minimize potential adverse effects of the project
- Receive your input
- Outline commitments to future work and next steps

Finch West LRT Maintenance and Storage Facility

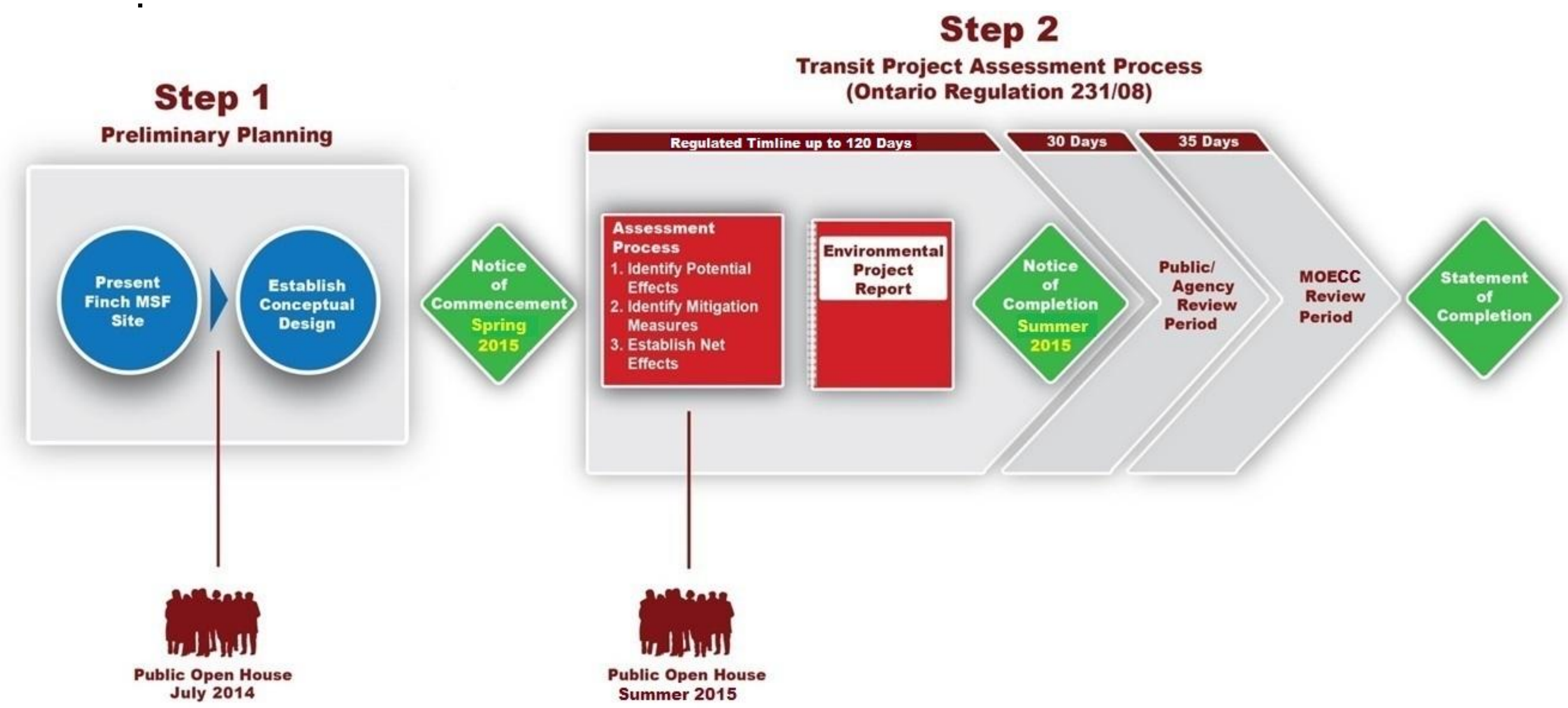
- MSF site was selected based on meeting criteria of size, proximity to LRT line and site availability
- The MSF will service up to 75 light rail vehicles (LRV) for the Finch West LRT Line and future Jane LRT Line
- Elements of the MSF include:
  - Main Repair Shop
  - Maintenance of Way
  - Operations
  - Electrical Substation



View from Southwest Corner of Site

Finch West LRT MSF Environmental Assessment Process

- **Step 1 (Preliminary Planning):** Presenting the Site, Establishing Conceptual Site Design, Documenting Existing Conditions, Preliminary Identification of Potential Effects and Proposed Mitigation
- **Step 2 (Transit Project Assessment Process):** Detailed Assessment of Effects, Preparation of Environmental Project Report, Public and Agency



Step 1

Preliminary Planning

Present Finch MSF Site

Establish Conceptual Design

Notice of Commencement Spring 2015

Step 2

Transit Project Assessment Process (Ontario Regulation 231/08)

Regulated Timline up to 120 Days

30 Days

35 Days

Assessment Process
1. Identify Potential Effects
2. Identify Mitigation Measures
3. Establish Net Effects

Environmental Project Report

Notice of Completion Summer 2015

Public/ Agency Review Period

MOECC Review Period

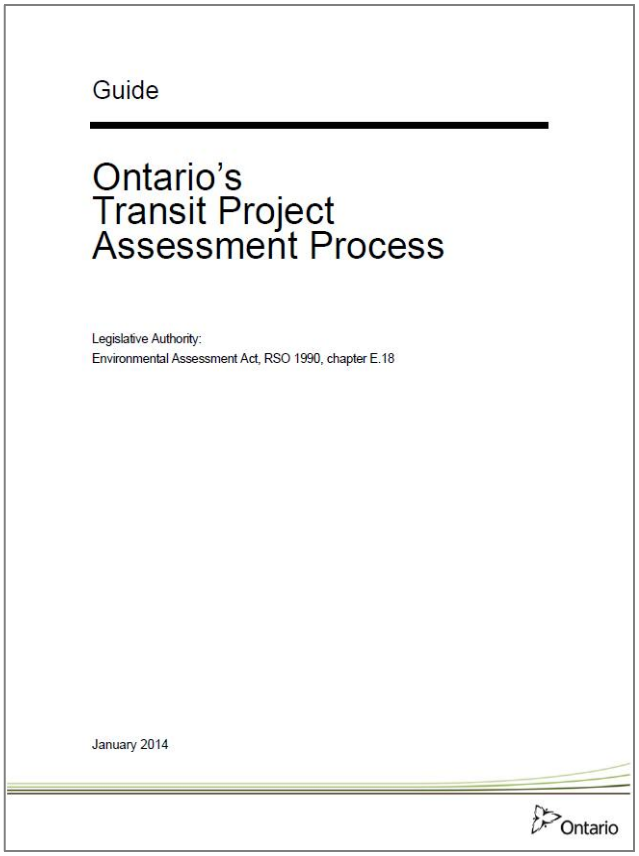
Statement of Completion

Public Open House July 2014

Public Open House Summer 2015

MSF Planning and Development Framework

- The EA is carried out under Ontario Regulation 231/08, Transit Project Assessment Process (TPAP)
- Metrolinx is partnering with Infrastructure Ontario (IO) to develop the MSF and the Finch West LRT
- The project will be designed and constructed using Infrastructure Ontario (IO's) Alternative Financing and Procurement (AFP) delivery model which allows for technical innovation
- IO plays a key role in Ontario's long-term infrastructure plan for public transit



Guide

Ontario's
Transit Project
Assessment Process

Legislative Authority:
Environmental Assessment Act, RSO 1990, chapter E.18

January 2014

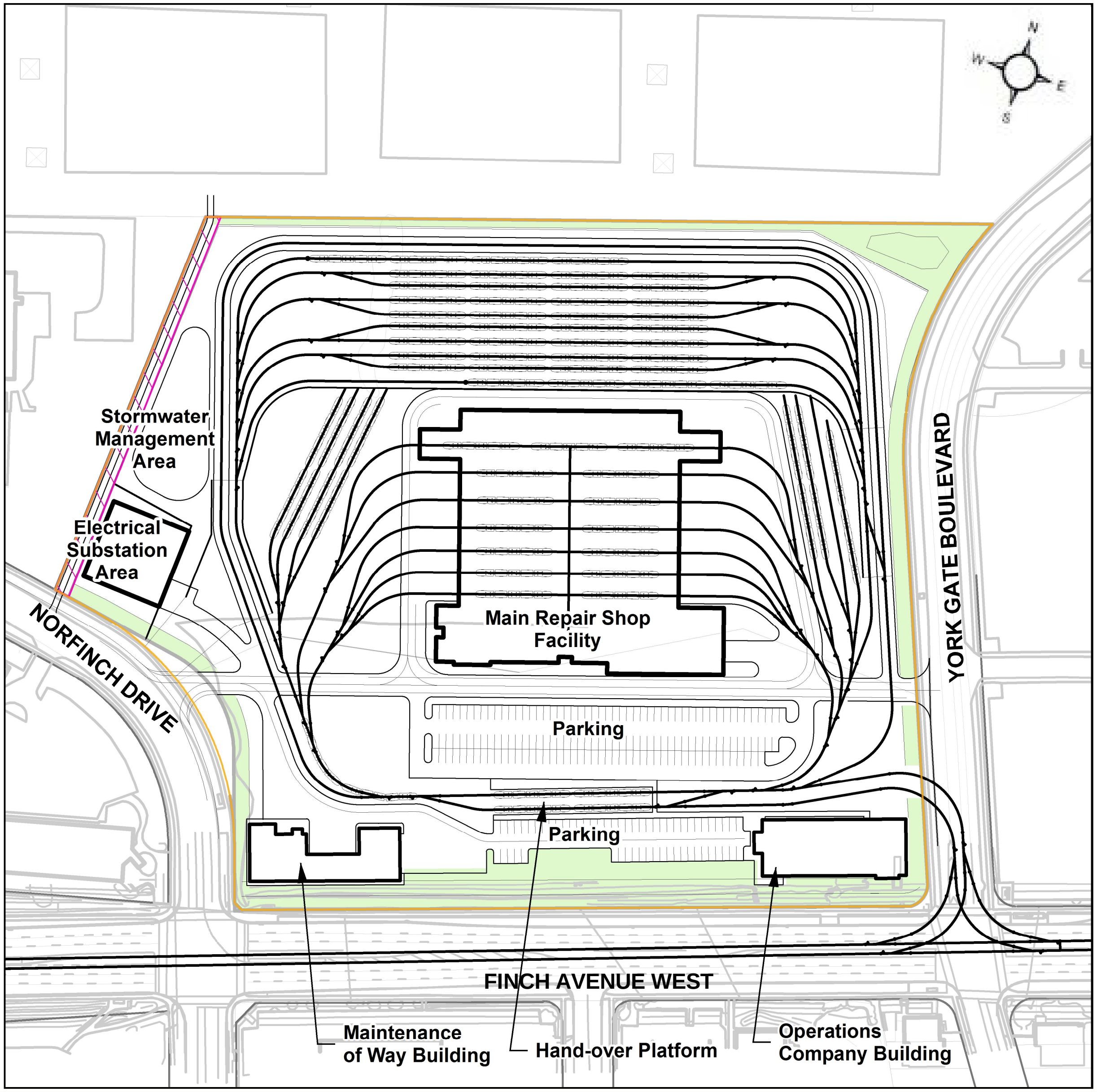
Ontario

Recap of Public Open House #1

- Open House #1 provided an overview of the project and existing environmental conditions forming the basis for effects assessment

- The following common themes/concerns in regard to the MSF were heard and addressed:
  - Ensure Safety and Accessibility During Construction
  - Investigate the Potential for Site Multi-Purpose Use of the Site
  - Minimize the Visual and Noise Impacts of the MSF

Preferred Conceptual Design for the MSF



Legend

- ▭ Property Limits for the MSF Site
- Light Rail Vehicle (LRV)
- — LRV Track
- ▨ Bicycle Path
- 🟩 Landscape Buffer

Preferred Conceptual Design for the MSF

View from the West Portion of Site

** Draft Rendering Subject to Change*

Preferred Conceptual Design for the MSF

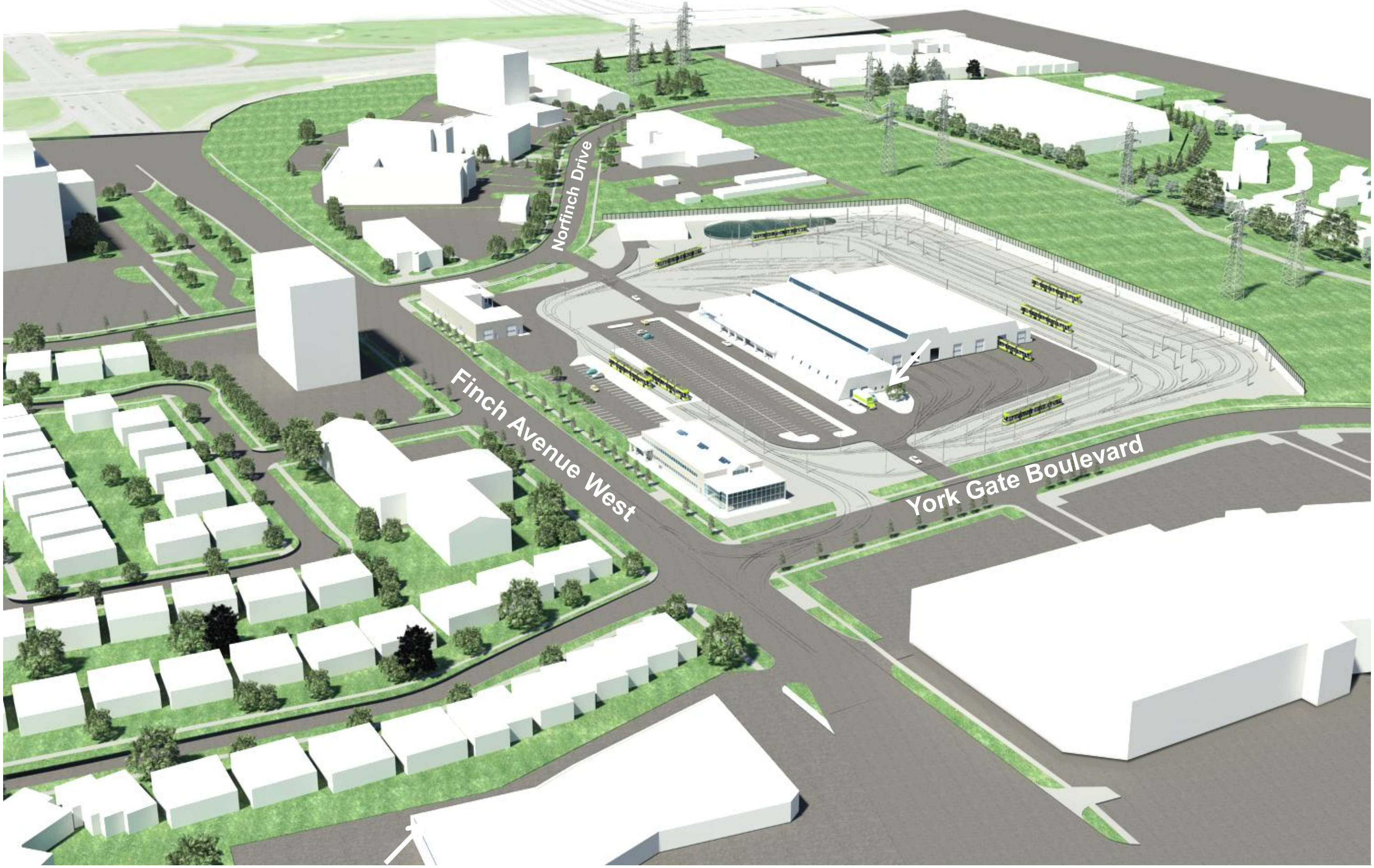
View from the Southeast Portion of Site

** Draft Rendering Subject to Change*

Preferred Conceptual Design for the MSF

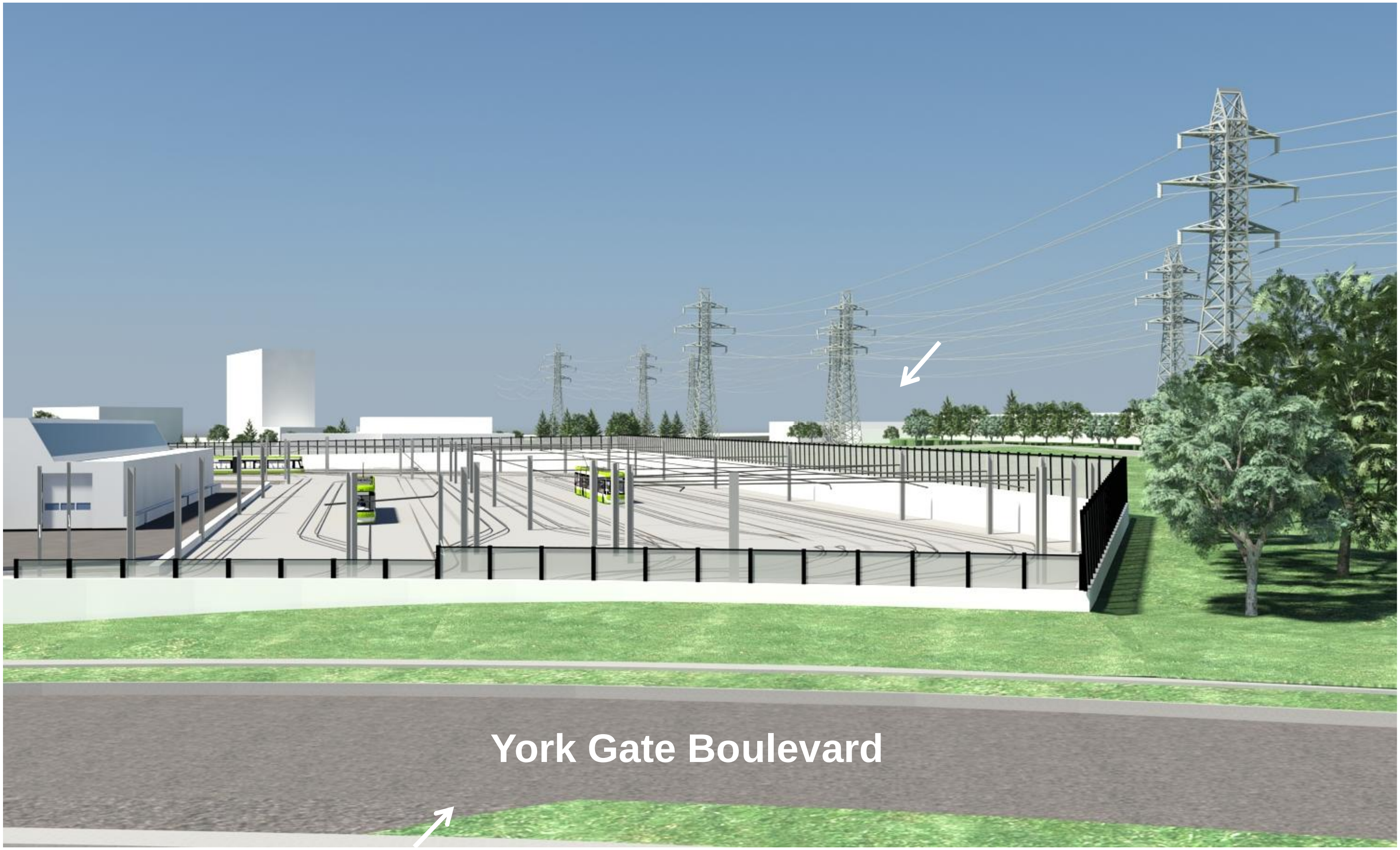
View from the Southeast Portion of Site

** Draft Rendering Subject to Change*



Preferred Conceptual Design for the MSF

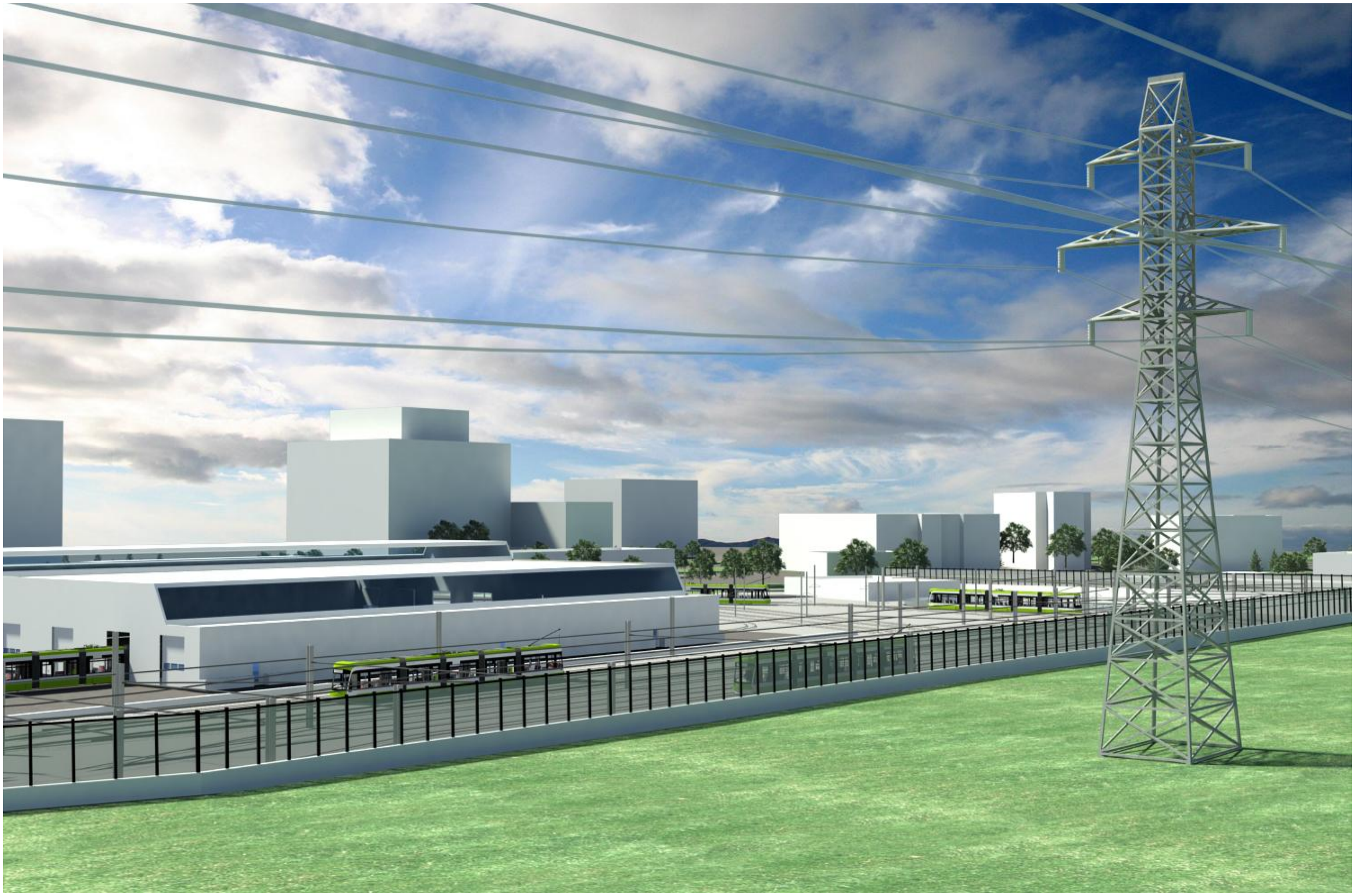
View from the East Portion of Site (eye level) ** Draft Rendering Subject to Change*



Preferred Conceptual Design for the MSF

View from the North Portion of Site

** Draft Rendering Subject to Change*



Effects Assessment Process

The Effects Assessment for the Preferred MSF Concept Design was carried out in accordance with *Ontario Regulation 231/08 (TPAP)*, as follows:

- Documented potential effects on:
    - Natural Environment (Terrestrial, Aquatic, Geology and Hydrogeology)
    - Traffic & Transportation
    - Noise and Vibration
    - Air Quality
    - Socio-Economic Environment (Land Use, Visual Character, Community Features)
- Developed measures to mitigate/minimize/compensate for potential adverse effects
- Confirmed net or residual effects, if any
- Developed environmental monitoring to ensure the implemented mitigation measures function as intended

Natural Environment – Potential Effects & Mitigation

Potential Effects:

- Removal of identified migratory birds nesting and associated on-site vegetation
- Permanent displacement of Species at Risk (SAR)

Mitigation:

- Avoid vegetation removals during the typical nesting period of migratory birds (May 1 to July 31) in accordance with the *Migratory Birds Convention Act, 1994*
- Develop Habitat Management Plan for the SAR in accordance with O.Reg. 242/08 under *Endangered Species Act, 2007*
- Maintain SAR compensation habitat for a period of 20 years, including a minimum of 5 years of annual monitoring

Noise – Potential Effects & Mitigation

Potential Effects:

- Sensitive receptors may experience increased noise during construction and operations

Mitigation:

- Construction Noise Management Plan will be developed to address noise generated during construction including a construction noise complaint process and action plan
- The MSF will be designed to meet operational noise requirements of the Ministry of the Environment and Climate Change (MOECC) document NPC-300 and MOEE/TTC Draft Protocol for Noise and Vibration Assessment to minimize effects to:
    - Residential dwellings
    - Hotels
    - Nursing Homes
    - Schools
    - Hospitals

Vibration – Potential Effects & Mitigation

Potential Impacts:

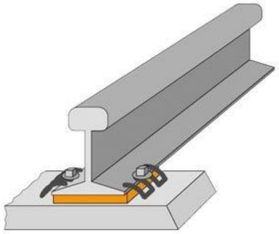
- ➢ Sensitive receptors may experience building damage during construction and operations.

Figure Credit: www.getzner.com

Mitigation:

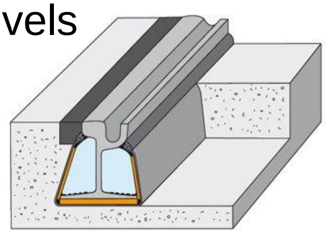
High Resilience Fastener (Rail Pad)

- Reduces vibration levels



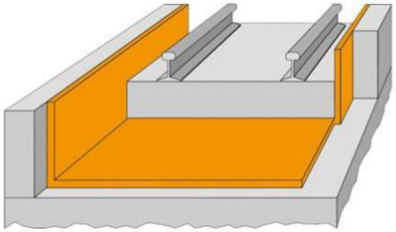
Rubber Embedded Rail

- Reduces vibration levels



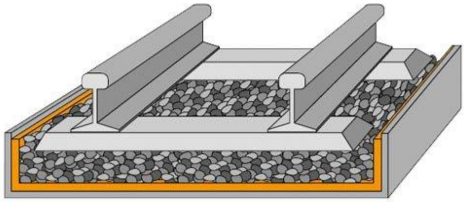
Floating Slab Track Bed

- Protects vibration sensitive buildings in the vicinity of tracks



Ballast Mats

- Reduces secondary airborne noise and vibrations



Air Quality – Potential Effects & Mitigation

Potential Effects:

- Nuisance dust and emissions during construction.
- Effects to local air quality during facility operations.

Mitigation:

- Dust Management Plan will be developed to comply with regulations and standards and to reduce dust during construction.
- Environmental Compliance Approval during detailed design.
- Other mitigation measures may include:
    - Install ventilation/dust collection system for compressed air cleaning of traction motors and selected roof-mounted components.
    - Locate stack for potential paint booth exhaust at least 20 m from nearest property line and design stack parameters to ensure good dispersion (no rain caps).

Transportation – Potential Effects & Mitigation

Potential Effects:

- Increased travel times during construction (Norfinch Dr. & York Gate Blvd.).
- Safety concerns for pedestrians and cyclists.
- Effects on existing TTC bus service.

Mitigation:

- Divert traffic to parallel arterial and collector roads during traffic impact.
- Incorporate signing, striping and active devices into design for pedestrian and cyclist safety.
- Liaise with TTC to address route requirements during construction.
- Post appropriate signage and public notification during construction.

The construction of the Finch West LRT line has specific mitigation measures in the approved EA for the Finch Line.

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Other Mitigation Measures During Construction

Measures will be implemented during construction to avoid, minimize or mitigate adverse environmental effects including:

- Erosion and sedimentation control
- Development and implementation of traffic management plans
- Construction staging and sequencing to mitigate the potential impacts on local businesses to the extent possible
- Ongoing management and monitoring of construction activities

Other Mitigation Measures During Operations and Maintenance

Measures will be implemented during LRT operations and maintenance to avoid, minimize or mitigate adverse effects including:

- Stormwater run-off will be treated in accordance with applicable City of Toronto, Toronto and Region Conservation Authority (TRCA) and MOECC requirements
- Noise, vibration and air emissions generated by LRT vehicles will be attenuated to meet MOECC standards

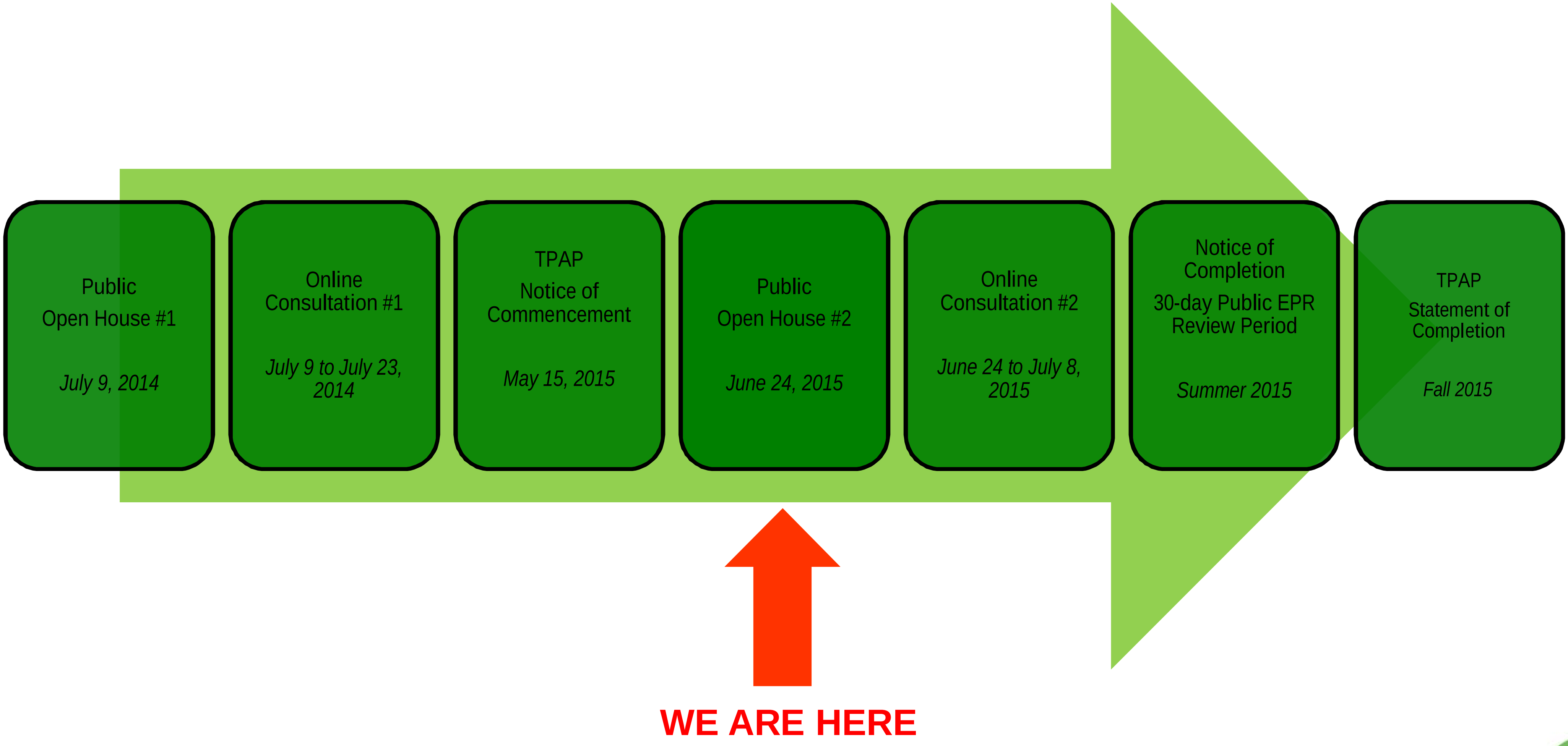
Commitments to Future Work

Following the approval of the Finch MSF EA, Metrolinx will proceed with the delivery of the Finch West MSF through Public Private Partnership and Alternative Financing and Procurement (AFP)

Through this process, Metrolinx is committed to:

- ➢ Public Consultation: Consult with the public, property owners, agencies and other stakeholders during the detailed design of the MSF
- ➢ Construction Mitigation: Develop mitigation plans, as necessary:
    - ▪ Noise, vibration and air emissions monitoring and mitigation
    - ▪ Traffic, transit and pedestrian management strategies
    - ▪ Utility and municipal services relocation plans
    - ▪ Landscaping plans
    - ▪ Soil and groundwater management study
    - ▪ Erosion and sedimentation control plan

Consultation Process Timelines



Public
Open House #1

July 9, 2014

Online
Consultation #1

July 9 to July 23, 2014

TPAP
Notice of
Commencement

May 15, 2015

Public
Open House #2

June 24, 2015

Online
Consultation #2

June 24 to July 8, 2015

Notice of
Completion
30-day Public EPR
Review Period

Summer 2015

TPAP
Statement of
Completion

Fall 2015

WE ARE HERE

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What Happens Next?

- Please submit MSF EA comments to the project team by **July 8, 2015**
- Comments received will be reviewed and considered by the project team
- A Consultation Summary Report will be posted on the project website in early August 2015
- Using feedback, the project team may refine mitigation and monitoring for the site and finalize the Environmental Project Report (EPR)
- A Notice of Completion will be filed in Summer 2015.
- The EPR will be available for a final 30-day public review period following the Notice of Completion
- Visit the project website to view the latest project information

Thank you for participating!

Please get in touch with us:

WEBSITE	**www.metrolinx.com/finchwest**
EMAIL	**finchwest@metrolinx.com**
PHONE	**416-869-3600 ext. 5739**
TTY	**1-800-387-3652**

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UP
Union
Pearson
Express

A4. Public Open House #2

Summary Report Appendix C
Public Comments

#

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COMMENT SHEET

Finch West Light Rail Vehicle Maintenance and Storage Facility Environmental Assessment Study

Public Open House #2 – June 24, 2015

Please take a few minutes to return your comments this evening or by **July 8th, 2015** via e-mail to:

E-mail: finchwest@metrolinx.com
Phone: 416-869-3600 Ext. 5739
TTY: 1-800-387-3652
Website: www.metrolinx.com/finchwest

Do you have any comments on the preferred conceptual design of the Maintenance and Storage Facility?

Yes! There is no space along Finch Ave for a~~a~~ multi purpose facility or Arts Centre. ~~How~~ What do the residents get from this build? Most important to design the space with a Community Benefit eg. facilities for residents to use eg Hall

Do you have any comments on the potential effects and mitigation measures identified?

If you would like to be added to the project mailing list, please give us contact information (please print clearly):

Name:
E-mail:
Address:
City:
Phone #:

[redacted]

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COMMENT SHEET

Finch West Light Rail Vehicle Maintenance and Storage Facility
Environmental Assessment Study
Public Open House #2 – June 24, 2015

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

° The separate multi use path should be a bit bigger.

° How can the Build support the hundreds of kids who play soccer on the Hydro lands build some bleachers?

° ~~How do you~~ How are you going to ensure the Jane Finch residents benefit from this build instead of another build that is imposed on the community.

° There is an opportunity here for improvements that will enhance JF - lets make it happen!

#

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E-mail: finchwest@metrolinx.com
Phone: 416-869-3600 Ext. 5739
TTY: 1-800-387-3652
Website: www.metrolinx.com/finchwest

Do you have any comments on the preferred conceptual design of the Maintenance and Storage Facility?

It SHOULD include a mixed-use component as part of the program. The LRT CORRIDOR should improve the urban street edge whereas the preferred conceptual design illustrates a suburban street edge condition (ie. Parking lot along FINCH.)

Do you have any comments on the potential effects and mitigation measures identified?

If you would like to be added to the project mailing list, please give us contact information (please print clearly):

Name: [redacted]
E-mail:
Address:
City:
Phone #:

#

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COMMENT SHEET

Finch West Light Rail Vehicle Maintenance and Storage Facility Environmental Assessment Study

Public Open House #2 – June 24, 2015

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

- improve the built form along Finch
- Perhaps could include affordable Housing to supper LRT ridership
- Bussiness type commercial uses
- improve community engagement by delivering a program that improves existing context.

____

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E-mail: finchwest@metrolinx.com
Phone: 416-869-3600 Ext. 5739
TTY: 1-800-387-3652
Website: www.metrolinx.com/finchwest

Do you have any comments on the preferred conceptual design of the Maintenance and Storage Facility?

Do you have any comments on the potential effects and mitigation measures identified?

My concern is ~~that~~ the left turn signals into residential streets, should have advanced green at those intersections.

At the intersections there should be no raised platforms that would prevent exit or entry from/to residential streets.

If you would like to be added to the project mailing list, please give us contact information (please print clearly):

Name: ____
E-mail: ____
Address: ____
City: ____ **Postal Code:** ____
Phone #: ____

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COMMENT SHEET

Finch West Light Rail Vehicle Maintenance and Storage Facility
Environmental Assessment Study
Public Open House #2 – June 24, 2015

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

NO [illegible] and [illegible] a fuck.

#

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Finch West Light Rail Vehicle Maintenance and Storage Facility Environmental Assessment Study

Public Open House #2 – June 24, 2015

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E-mail: finchwest@metrolinx.com
Phone: 416-869-3600 Ext. 5739
TTY: 1-800-387-3652
Website: www.metrolinx.com/finchwest

Do you have any comments on the preferred conceptual design of the Maintenance and Storage Facility?

- IT IS A VERY BAT IDEA
- IF THESE IS THE WAY YOU WANT TO IMPROVE THE JANE AND FINCH BY ~~[illegible]~~ BUILDING A GARAGE ON A PRIVE LAND????

Do you have any comments on the potential effects and mitigation measures identified?

- ~~NO~~. NO. NO. NO FOR A GARAGE ~~AND~~ ONE JANE AND FINCH.

If you would like to be added to the project mailing list, please give us contact information (please print clearly):

Name:
E-mail:
Address:
City:
Phone #:

[redacted]

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E-mail: finchwest@metrolinx.com
Phone: 416-869-3600 Ext. 5739
TTY: 1-800-387-3652
Website: www.metrolinx.com/finchwest

Do you have any comments on the preferred conceptual design of the Maintenance and Storage Facility?

I believe that cars will still be the needed mode of Transport for most people. Trucks are needed for delivery of goods and they need easy Traffic lane. The concept may be OK for now but 2 or 3 decades from now there will be regret not To have improved roads and done a subway. In the long run it would have been cheaper to use & maintain.

Do you have any comments on the potential effects and mitigation measures identified?

I heard from a city councillor that now there are not enough people for a subway. The project consider city like Calgary a place of mitigate Temperature. ?? Toronto has a long winter and people need stations To repair from weather, cold and car splash. Did not see any in the "concept". A previous concept "beautiful" as it was termed Turned out a disaster "St. Claire" My experience is that "studies" have always been far from reality - but - "good luck" I can always move -

If you would like to be added to the project mailing list, please give us contact information (please print clearly):

Name: ____________________
E-mail: ____________________
Address: ____________________
City: ____________________ **Postal Code:** ____________________
Phone #: ____________________

#

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Finch West Light Rail Vehicle Maintenance and Storage Facility Environmental Assessment Study

Public Open House #2 – June 24, 2015

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

Good place to put in. Hope
less apt's will go there in that
area to clog the Traffic
What about the intersection of
Finch & 400?

#

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E-mail: finchwest@metrolinx.com
Phone: 416-869-3600 Ext. 5739
TTY: 1-800-387-3652
Website: www.metrolinx.com/finchwest

Do you have any comments on the preferred conceptual design of the Maintenance and Storage Facility?

Do WE need THIS FACILITY IN THE JANE/ FINCH COMMUNITY? WAS AND IS THERE OTHER SITES THAT would BE A BETTER CHOICE. THE AREA NEEDS TO improve I do NOT THINK A MSF FOR LRT IS AN AREA BETTERMENT. I AlWAYS THOUGHT THAT CORNER PROPERTY would HAVE BETTER SERVED THE COMMUNITY WITH, NEW CONDO'S

Do you have any comments on the potential effects and mitigation measures identified?

AND COMMERCIAL/ RETAIL STORES, MUCH LIKE THEY ARE Building Along wilSON EAST OF THE SUBWAY. WHAT EFFECT will THIS HAVE ON TRAFFIC? - TRAFFIC CONGESTION WITH HEAVY GAS TRUCKS ETC... USING FINCH, I CAN only SEE IT GETTING WORSE.

FEEl THIS PROJECT WAS PUT THROUGH WITHOUT MUCH INPUT FROM AREA RESIDENCES -

If you would like to be added to the project mailing list, please give us contact information (please print clearly):

Name:
E-mail:
Address:
City:
Phone #:

[redacted]

#

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Finch West Light Rail Vehicle Maintenance and Storage Facility
Environmental Assessment Study
Public Open House #2 – June 24, 2015

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Phone: 416-869-3600 Ext. 5739
TTY: 1-800-387-3652
Website: www.metrolinx.com/finchwest

Do you have any comments on the preferred conceptual design of the Maintenance and Storage Facility?

- green roof please!
- reduced parking lot at front to improve pedestrian experience

Do you have any comments on the potential effects and mitigation measures identified?

If you would like to be added to the project mailing list, please give us contact information (please print clearly):

Name: [redacted]
E-mail:
Address:
City:
Phone #:

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Finch West Light Rail Vehicle Maintenance and Storage Facility
Environmental Assessment Study
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E-mail: finchwest@metrolinx.com
Phone: 416-869-3600 Ext. 5739
TTY: 1-800-387-3652
Website: www.metrolinx.com/finchwest

Do you have any comments on the preferred conceptual design of the Maintenance and Storage Facility?

Would be good to take the same design principles used in the new Leslie Barn's to animate the surrounding streets and draw positive attention to an otherwise noisey and drab facility
i.e. green roofs, attractive murals + LRT inspired art works

Do you have any comments on the potential effects and mitigation measures identified?

If you would like to be added to the project mailing list, please give us contact information (please print clearly):

Name: ____________________
E-mail: ____________________
Address: ____________________
City: ____________________ **Postal Code:** ____________________
Phone #: ____________________

[redacted]

#

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COMMENT SHEET
Finch West Light Rail Vehicle Maintenance and Storage Facility
Environmental Assessment Study
Public Open House #2 – June 24, 2015

Please provide us with any other bike lane **~~Maintenance and Storage Facility~~ comments you may have about this project.**

Would be a good idea to add a curb between proposed bike lane and vehicular traffic for added safety measures.

\# ______

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E-mail: finchwest@metrolinx.com
Phone: 416-869-3600 Ext. 5739
TTY: 1-800-387-3652
Website: www.metrolinx.com/finchwest

Do you have any comments on the preferred conceptual design of the Maintenance and Storage Facility?

Jane & Finch is notorious for teens having guns and shooting each other. The Maintenance and Storage Facility should have lots of monitored cameras (that can see if it is dark) to discourage the Facility from becoming a killing field.

Do you have any comments on the potential effects and mitigation measures identified?

What is going to happen to large snow falls? Is there going to be co-ordination between the city and Metrolinx on snow removal?
2 times Finch has been washed out & closed (once for eight months near this school. Bombardier has not been able to fulfill their current Street car commitment. How can they be trusted in the future? How can the increadably poor planning such as the 6 inch height be avoided? Why isn't there penalties (preferably criminal) for such ineptitude?!!

If you would like to be added to the project mailing list, please give us contact information (please print clearly):

Name:
E-mail:
Address:
City:
Phone #:
[redacted]

#

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COMMENT SHEET

Finch West Light Rail Vehicle Maintenance and Storage Facility Environmental Assessment Study
Public Open House #2 – June 24, 2015

Please provide us with any other Maintenance and Storage Facility comments you may have about this project.

Why isn't the whole thing, including the LRT under ground? The Eglinton line has portions underground.

This creates an issue with north south traffic flow dividing neighborhoods; and making deliveries difficult. It creates a "Wrong Side of the track" scenario, where bad neighborhoods are isolated and contained and a virtual moat around the city.

Why not use the Power line right of way instead of usable property?

#

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E-mail: finchwest@metrolinx.com
Phone: 416-869-3600 Ext. 5739
TTY: 1-800-387-3652
Website: www.metrolinx.com/finchwest

Do you have any comments on the preferred conceptual design of the Maintenance and Storage Facility?

THE ENTIRE FINCH FRONTAGE NEEDS TO BE 3 STOREY COMMERCIAL
THERE SHOULD BE NO SURFACE LEVEL PARKING
THE STORMWATER POND SHOULD NOT BE FENCED OFF. IT SHOULD DESIGNED TO BE AN ACCESSIBLE DESIGN FEATURE

Do you have any comments on the potential effects and mitigation measures identified?

If you would like to be added to the project mailing list, please give us contact information (please print clearly):

Name:
E-mail:
Address:
City: **Postal Code:**
Phone #:

From: Finch West <FinchWest@metrolinx.com>
Sent: Tuesday, July 07, 2015 1:43 PM
To: Amirsalari, Faranak
Cc: Les MacDermid; Morgan Rubes
Subject: FW: MSF Proposal.

From: Finch West
Sent: Thursday, July 02, 2015 2:29 PM
To: [redacted]
Subject: RE: MSF Proposal.

Hi [redacted]

My apologies for the delay in response.

Thank you for your email and your interest in the project. Input from the community is key to the project.

Metrolinx acquired the land in 2011 from the Province of Ontario. For Metrolinx it represents the optimal location for a Maintenance and Storage Facility for transit activities.

Metrolinx has been reviewing the zoning by-law with the City to address any potential issues with a transit facility.

We hope that you had an opportunity to attend the open house on June 24th. Boards were prepared to help explain why the facility is proposed for this location. Other sites along the Finch corridor were reviewed, but deemed incapable of supporting the Finch LRT. The site, north of Finch between York Gate and Norfinch is the ideal location for a maintenance and storage facility to support the LRT.

Additional information is available on the Finch MSF website.
http://www.metrolinx.com/en/projectsandprograms/transitexpansionprojects/finch_west.aspx

Regards,

Joanna Hui
Media Relations & Issues Specialist
METROLINX
20 Bay Street, Suite 600, Toronto, ON M5J 2W3
416-869-3600 X 5739
Joanna.Hui@metrolinx.com

From: [redacted]
Sent: Thursday, June 11, 2015 1:18 PM
To: Finch West
Subject: Fw: MSF Proposal.

On Thursday, June 11, 2015 1:15 PM, [redacted] wrote:

Could you please inform me when Metrolinx purchased the
land for the proposed MSF and when and how this lot that is designated
Chapter 15 Residential Apartment under By-Law 569-2013 was re-zoned?

There is no mention of re-zoning in the August 19, 2014 amendment.

Wouldn't this property be better serving our area if low rental housing
was build. Surely it is not the place for a street car maintainance yard.

Thanks,

[redacted]

From:	Finch West <FinchWest@metrolinx.com>
Sent:	Tuesday, July 07, 2015 1:45 PM
To:	Amirsalari, Faranak
Cc:	Les MacDermid; Morgan Rubes
Subject:	FW: FYI ONLY - FW: FINCH WEST LIGHT RAIL - USE HYDRO CORRIDOR - SAVE MONEY

From: Finch West
Sent: Friday, June 12, 2015 3:54 PM
To: Gabriel Florez Lopez; Les MacDermid
Cc: Jamie Robinson
Subject: FYI ONLY - FW: FINCH WEST LIGHT RAIL - USE HYDRO CORRIDOR - SAVE MONEY

From: [redacted]
Sent: Friday, June 12, 2015 11:10 AM
To: Finch West
Subject: FINCH WEST LIGHT RAIL - USE HYDRO CORRIDOR - SAVE MONEY

Re Finch West Light Rail (streetcar or whatever name) USE Hydro Corridor June 12,2015

Instead of harming business and messing up traffic on Finch West and it's high costs, WHY NOT

use the Hydro Line Corridor just north of Finch. It can run unimpeded on it by vehicular traffic.

It should not be considered a health hazard being below electric power lines. The Finch and Yonge subway parking is below it and the York U busway going west from Dufferin is as well. Also, we now have a paved walkway beneath running west from Talbot.

Lights can be set fror this rapid transit as we now have lights at Alness for the buses and at Bathurst and Talbot for pedesrtrians and bikes.

I suggest that costs would be a lot less. One only needs to look at the St. Clair costs. I am sure much would be applicable to being on Finch itself but not apply if under the hydro lines.

Yours truly

[redacted]

From: Pettigrew, Renee
Sent: Friday, June 19, 2015 11:23 AM
To: Amirsalari, Faranak; Blacha, Madelin
Subject: FW: PLEASE RESPOND: Resident Council from Norfinch-Long Term Care

---

From: Les MacDermid [mailto:Les.MacDermid@metrolinx.com]
Sent: Friday, June 19, 2015 10:57 AM
To: Joanna Hui; Pettigrew, Renee
Subject: RE: PLEASE RESPOND: Resident Council from Norfinch-Long Term Care

Discussion with [redacted]

- Main concern is Noise of the facility. He is fairly new and heard the resident association was concerned with the noise
    - I discussed the project gave him a bit of background
    - Highlighted that the facility will be designed to meet ministry requirements for Noise and Vibration and the impact to sensitive receptors will be mitigated throughout the construction and operation of the system.
    - Encouraged him to attend or have someone attend the open house to get more information.

Les

Les MacDermid, P.Eng.
Senior Project Manager, Sheppard and Finch West LRT, Rapid Transit, Capital Projects Group
Metrolinx |5150 Yonge Street | Concourse Level | Toronto, ON | M2N 6L6
T: 416.228.9392 C:416.816.5181

From: Finch West
Sent: Friday, June 19, 2015 10:31 AM
To: Les MacDermid
Cc: Gabriel Florez Lopez
Subject: PLEASE RESPOND: Resident Council from Norfinch-Long Term Care

Hi Les,

Please respond –

I left [redacted] a message, but seeing that his seniors home is at 22 Norfinch, he might be more interested in the MSF than the overall project. Please give him a call at the number below.

Thanks!

From: [redacted]
Sent: Tuesday, June 16, 2015 4:00 PM

To: Finch West
Subject: Resident Council from Norfinch-Long Term Care

Hello

I was talking to my Resident Council at Norfinch Care Community. We are located very close to the new location of the LRT project
The concern for many of the residents is the noise factor.

Can you explain to me a little more about the project, my residents wil be unable to attend.

Thank-you very much

[redacted]

From:	Finch West <FinchWest@metrolinx.com>
Sent:	Tuesday, July 07, 2015 1:44 PM
To:	Amirsalari, Faranak
Cc:	Les MacDermid; Morgan Rubes
Subject:	FW: public open house

From: Finch West
Sent: Friday, June 26, 2015 3:44 PM
To: [redacted]
Subject: RE: public open house

Hi [redacted]

I'm sorry you missed our open house, and unfortunately there isn't another one planned in the near future. However you can see the presentations here:
http://www.metrolinx.com/en/projectsandprograms/transitexpansionprojects/finch_west.aspx

And I will add you to our email list to notify you of any future communications RE Finch West LRT.

Thank you for your interest in our project.

Regards

Joanna Hui
Media Relations & Issues Specialist
METROLINX
20 Bay Street, Suite 600, Toronto, ON M5J 2W3
416-869-3600 X 5739
Joanna.Hui@metrolinx.com

From: [redacted]
Sent: Thursday, June 25, 2015 10:50 PM
To: Finch West
Subject: public open house

Hello I missed the open house on June 24 at St Wilfred's Will there be another open house in the future Thank You [redacted]

From: Finch West <FinchWest@metrolinx.com>
Sent: Tuesday, July 07, 2015 1:41 PM
To: Amirsalari, Faranak
Cc: Les MacDermid; Morgan Rubes
Subject: FW: Maintenance & Storage Facility (MSF) - Finch West LRT

From: [redacted]
Sent: Thursday, July 02, 2015 3:51 PM
To: Finch West
Subject: RE: Maintenance & Storage Facility (MSF) - Finch West LRT

Ok thank you Joanna.

Best,

[redacted]

From: Finch West [mailto:FinchWest@metrolinx.com]
Sent: Thursday, July 2, 2015 3:48 PM
To: [redacted]
Subject: RE: Maintenance & Storage Facility (MSF) - Finch West LRT

Hi [redacted]

The procurement for the Finch West LRT has not yet begun. That information would be available when Infrastructure Ontario opens the RFP or closes the RFQ. All projects by Metrolinx are competitively procured. I suggest checking with the MERX or the Infrastructure Ontario websites regularly.

Regards,

Joanna Hui
Media Relations & Issues Specialist
METROLINX
20 Bay Street, Suite 600, Toronto, ON M5J 2W3
416-869-3600 X 5739
Joanna.Hui@metrolinx.com

From: [redacted]
Sent: Thursday, July 02, 2015 10:25 AM
To: Finch West
Subject: RE: Maintenance & Storage Facility (MSF) - Finch West LRT

Hi Joanna,

Hope you had a nice Canada Day! I checked the Infrastructure Ontario website and didn't see anything pertaining to the Finch West LRT. Would you perhaps be aware of any other projects within Metrolinx or other that do require pre-engineered steel buildings now or in the near future?

Thank you so much for your time,

[redacted]

From: Finch West [mailto:FinchWest@metrolinx.com]
Sent: Tuesday, June 30, 2015 5:18 PM
To: [redacted]
Subject: RE: Maintenance & Storage Facility (MSF) - Finch West LRT

Hi [redacted]

Project Co. could elect to use pre-engineered buildings in their design provided that it meets the design criteria that Project Co. must be compliant with. Each proponent may choose to design the project differently in the process of submitting their RFP response. A list of qualified bidders may be released on the Infrastructure Ontario website for the

Finch West LRT project. My suggestion would be to contact the bidders to see if they would be interested in any steel PEB products.

Thank you for your interest in our project.

Regards,

Joanna Hui
Media Relations & Issues Specialist
METROLINX
20 Bay Street, Suite 600, Toronto, ON M5J 2W3
416-869-3600 X 5739
Joanna.Hui@metrolinx.com

From: [redacted]
Sent: Saturday, June 27, 2015 6:32 PM
To: Finch West
Subject: Maintenance & Storage Facility (MSF) - Finch West LRT

Hello,

Would you kindly advise if a steel pre-engineered building (PEB) design is considered for the Maintenance and Storage Facility for the Finch West LRT?

Please let me know at your earliest convenience and if so, whom is the primary contact regarding the project procurement ?

Thanks very much!

[redacted]

From: Finch West <FinchWest@metrolinx.com>
Sent: Tuesday, July 07, 2015 1:44 PM
To: Amirsalari, Faranak
Cc: Les MacDermid; Morgan Rubes
Subject: FW: Web Link Error

From: Finch West
Sent: Tuesday, June 30, 2015 5:02 PM
To: [redacted]
Subject: RE: Web Link Error

Hi [redacted]

Thank you for noting. We will correct it shortly.

Regards,

Joanna Hui
Media Relations & Issues Specialist
METROLINX
20 Bay Street, Suite 600, Toronto, ON M5J 2W3
416-869-3600 X 5739
Joanna.Hui@metrolinx.com

From: [redacted]
Sent: Tuesday, June 30, 2015 4:57 PM
To: Finch West
Subject: Web Link Error

Greetings:

On your page at http://www.metrolinx.com/en/projectsandprograms/transitexpansionprojects/finch_west.aspx, the links labelled Finch West LRT and Maintenance and Storage Facility both point to the same presentation, the generic one for the LRT line.

[redacted]

A4. Public Open House #2

Summary Report Appendix D
Stakeholder Correspondence

From: Pettigrew, Renee
Sent: Friday, May 15, 2015 9:42 AM
To: Amirsalari, Faranak; Blacha, Madelin
Cc: Arcand, Lawrence (Forwarder)
Subject: Fw: Finch West Maintenance and Storage Facility EA

From: SecondaryLandUse@HydroOne.com
Sent: Friday, May 15, 2015 9:40 AM
To: les.macdermid@metrolinx.com; Pettigrew, Renee
Cc: ierullo@HydroOne.com; w.d.kloostra@HydroOne.com; Zone2Scheduling@HydroOne.com
Subject: Finch West Maintenance and Storage Facility EA

Dear Mr. MacDermid and Ms. Pettigrew,

In our initial review, we can confirm that there are no Hydro One Transmission (above 115 kV) Facilities in the subject area. Please note there may also be Hydro One Distribution facilities in your study area (ie. Distribution wires operating below 115 kV). In order to cover off the impact to all Hydro One assests, please also forward your EA to the following email address:

Zone2Scheduling@HydroOne.com

Please be advised that this is only a preliminary assessment based on current information. No further consultation with Hydro One Networks Inc. is required if no changes are made to the current information.

If you have any further questions or concerns, please feel free to contact me.

Regards,

Claire Zhang
Tel: 416-345-4249
On behalf of
Secondary Land Use
Transmission Asset Management
Hydro One Networks

Blacha, Madelin

From:	Pettigrew, Renee
Sent:	Tuesday, June 02, 2015 8:09 PM
To:	Blacha, Madelin
Cc:	Brutto, David; Amirsalari, Faranak
Subject:	Fw: Finch West Maintenance and Storage Facility Environmental Assessment - City of Toronto - Notice of Commencement
Attachments:	53461 - Finch West MSF Notice of Commencement Letter - June 2, 2015.pdf

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From: Annette Maher <AMaher@trca.on.ca>
Sent: Tuesday, June 2, 2015 3:36 PM
To: Les MacDermid
Cc: Renee Afoom-Boateng (RAfoom-Boateng@trca.on.ca); Pettigrew, Renee; finchwest@metrolinx.com
Subject: Re: Finch West Maintenance and Storage Facility Environmental Assessment - City of Toronto - Notice of Commencement

Hello Les,

Please see the attached document below for TRCA's response to the Finch West LRT MSF Notice of TPAP Commencement.

Should you have any questions, please do not hesitate to contact either myself or Renee Afoom-Boatenage (ext. 5714).

Thank you,

Annette Maher, M.A.Sc.
Planner I
Environmental Assessment Planning
Planning and Development
Toronto and Region Conservation Authority
☎416.661.6600 x5798 | ✉amaher@trca.on.ca

NEW ADDRESS
Please note that we have moved to a new head office location
Office Location & Courier Address: 101 Exchange Avenue | Concord ON L4K 5R6
Mailing Address: 5 Shoreham Drive | Toronto ON M3N 1S4

Please consider the environment before printing this email

From: "Pettigrew, Renee" <Renee.Pettigrew@aecom.com>
To: "Renee Afoom-Boateng (RAfoom-Boateng@trca.on.ca)" <RAfoom-Boateng@trca.on.ca>, "amaher@trca.on.ca" <amaher@trca.on.ca>,
Cc: Les MacDermid <Les.MacDermid@metrolinx.com>
Date: 05/14/2015 05:20 PM
Subject: Finch West Maintenance and Storage Facility Environmental Assessment - City of Toronto - Notice of Commencement

---

On behalf of Les MacDermid, P.Eng., Metrolinx Senior Project Manager for the Finch West LRT Maintenance and Storage Facility project in the City of Toronto, I am sending you the attached Notice regarding the Commencement of the Transit Project Assessment Process for the Maintenance and Storage Facility Environmental Assessment for the Finch West Light Rail Transit System.

The Project
Metrolinx is initiating an Environmental Assessment (EA) Study under the Transit Project Assessment Process (TPAP) for the construction and operation of a Maintenance and Storage Facility to provide maintenance service and storage tracks for the new light rail vehicles (LRV) servicing the Finch West Light Rail Transit (LRT) Project. The Maintenance and Storage Facility is considered a necessary component of the Finch West LRT Project that was subject to an EA conducted under the TPAP in 2010; however the Environmental Project Report did not include the MSF. Accordingly, the EA for the Finch West MSF site is now underway and will follow the TPAP Process.

Process
The environmental impacts of this transit project will be assessed according to the TPA Process as prescribed in Ontario Regulation 231/08 made under the Ontario *Environmental Assessment Act*. As part of the TPAP, an Environmental Project Report is being prepared.

Consultation
Public consultation is a vital component to this project. Building on the Public Open House (POH) that was held in July 2014, the Project team will continue to engage and consult stakeholders throughout the TPA Process. Metrolinx will be hosting another POH (#2) in June. A separate Notice will be published shortly for additional details.

Should your agency have any questions or comments about this project or require additional information, please contact Renée Pettigrew, MCIP, RPP (Manager, Impact Assessment and Permitting) at renee.pettigrew@aecom.com. Comments may also be submitted on our Project website at www.metrolinx.com/finchwest or through our Project e-mail address at finchwest@metrolinx.com.

Thank you for your interest in this important transit investment in the City of Toronto.

Yours sincerely,

Renée Pettigrew, MCIP, RPP
Manager, Impact Assessment and Permitting
Environment
renee.pettigrew@aecom.com

AECOM
5080 Commerce Blvd
Mississauga, ON L4W 4P2
T 905.712.7077 C 416.575.1719
www.aecom.com

Toronto and Region
Conservation
for The Living City

June 2, 2015

CFN 53461

BY E-MAIL ONLY (les.macdermid@metrolinx.com)
Les Macdermid
Senior Project Manager
Metrolinx
5160 Yonge Street, Suite 300
North York ON
M2N 6L9

Dear Mr. Macdermid:

Re: Response to Notice of Study Commencement
Finch West Maintenance and Storage Facility
Transit Project Assessment Process (TPAP)
Humber River Watershed; City of Toronto – North York Community Council Area

Toronto and Region Conservation Authority (TRCA) staff received the Notice of Commencement for the above noted Environmental Assessment on May 14, 2015

Staff has reviewed the study area associated with this Environmental Assessment and advises that there are no TRCA areas of interest within the identified study limits. As such, staff has no concerns with the project.

Please include TRCA staff on the project mailing list. TRCA has interests in the associated Finch West LRT project and would like to continue to be informed about all aspects of the project. If the nature or scope of the study changes, please contact staff to confirm TRCA interests.

Should you have any questions, please contact me at extension 5714 or at rafoom-boateng@trca.on.ca.

Yours truly,

Renee Afoom Boateng

Renee Afoom-Boateng
Senior Planner, Environmental Assessment Planning
Planning and Development
AM/

BY E-MAIL
cc: Metrolinx: finchwest@metrolinx.com
Aecom: Renee Pettigrew, Manager, Impact Assessment and Permitting

Tel. 416.661.6600, 1.888.872.2344 | Fax. 416.661.6898 | info@trca.on.ca | 5 Shoreham Drive, Downsview, ON M3N 1S4

Member of Conservation Ontario www.trca.on.ca

Blacha, Madelin

From:	Pettigrew, Renee
Sent:	Friday, May 15, 2015 9:42 AM
To:	Amirsalari, Faranak; Blacha, Madelin
Subject:	Fw: West Finch Maintenance and Storage Facility project
Attachments:	HFN Response Letter - Metrolinx West Finch Maintenance and Storage Facility - May 14, 2015.doc

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From: Lori Loucks <lloucks@hiawathafn.ca>
Sent: Friday, May 15, 2015 9:39 AM
To: Pettigrew, Renee
Cc: les.macdermid@metrolinx.com
Subject: West Finch Maintenance and Storage Facility project

Dear Ms. Pettigrew,

Please find attached the response letter from Hiawatha First Nation regarding the above mentioned project. If you have any questions or comments regarding the letter please do not hesitate to contact me by one of the methods listed below.

Kind Regards,

Lori Loucks
Community Consultation Worker

Hiawatha First Nation
123 Paudash Street
Hiawatha, ON K9J 0E6
705-295-7771
705-295-7131 (fax)
lloucks@hiawathafn.ca

HIAWATHA FIRST NATION
123 Paudash Street
Hiawatha, ON K9J 0E6

Chief: **Greg Cowie**

Councillor: **Kirk Edwards**
Councillor: **Lorne Paudash**
Councillor: **Trisha Shearer**
Councillor: **Art Vowles**
Councillor: **Katie Wilson**

May 15, 2015

Dear Ms. Pettigrew;

Thank you for the information you sent to Hiawatha First Nation regarding the Metrolinx Finch West Maintenance and Storage Facility project which is being proposed within Hiawatha First Nation's Traditional and Treaty Territories. Hiawatha First Nation appreciates that Metrolinx and AECOM recognize the importance of First Nations Consultation and that your office is conforming to the requirements within the Duty to Consult Process. The correspondence Hiawatha First Nation has received is not considered meaningful consultation but rather information sharing.

As per the Hiawatha First Nation Consultation Protocol, your proposed project is deemed to have little, if any, impact on Hiawatha First Nation's traditional territory and/or rights. Please keep us apprised of any updates, archaeological findings, and/or of any environmental impacts, should they occur. Hiawatha First Nation requests you contact us if archaeological artifacts are found as we require our trained archaeological liaisons be present at the archaeological sites during the assessments. We also ask that you forward any archaeological reports to Hiawatha First Nation as they are completed. Any maps pertaining to the project should be sent to Hiawatha First Nation in a shape file.

Hiawatha First Nation reserves the right to provide additional comment should further development result in additional potential impact on our traditional territory and rights. Please be aware that while we request to be kept appraised throughout all phases of this project, we may not always have representation at all stakeholders meetings.

Further correspondence may be directed to my attention at the mailing address above or the e-mail address below.

In good faith and respect,

Lori Loucks
Core Consultation Worker
Hiawatha First Nation

lloucks@hiawathafn.ca
Tele: (705) 295-7771
Fax: (705) 295-7131

Cc Les MacDermid, Metrolinx

A5. Public Consultation

From: Finch West <FinchWest@metrolinx.com>
Sent: Tuesday, July 07, 2015 2:01 PM
To: Amirsalari, Faranak
Cc: Les MacDermid; Morgan Rubes
Subject: FW: PARCEL OF LAND between Ookdale Rd& Yorkgate blvd

---

From: [redacted]
Sent: Thursday, April 02, 2015 12:09 AM
To: Finch West
Subject: Re: PARCEL OF LAND between Ookdale Rd& Yorkgate blvd

Dear Robert,
Thank you so much for the wealth of information which i find very usefull, and so kind of you to take the time explain in detail.
regards

[redacted]

On Wednesday, April 1, 2015 4:01 PM, Finch West <FinchWest@metrolinx.com> wrote:

Hello [redacted]

Your email was forwarded to us by the Finch West LRT project team and I want to take the opportunity to address some of the questions you've brought forward.

As you noted in your email to us, some very preliminary work has taken place on the site of our Maintenance and Storage Facility (MSF) for the Finch West LRT line. The parcel of land located at Oakdale and York Gate Blvd will house this MSF building where the light-rail vehicles will be stored and maintained. The work taking place most recently is related to surveying – survey the land, take measurements, review the soil on site and see if there are any utilities close by. This work is normal pre-design work that must be done before developing a full design of the facility. The majority of this work has been completed so you shouldn't see too much activity in the near future.

The next step will be to complete an Environmental Assessment (EA) for the proposed MSF for the Finch West LRT. The EA for this facility has not formally begun but we did have an initial public consultation last July and we do plan to have more in the future about this facility, and the LRT itself. The only other timeline I can pass along is that construction of this line should begin in 2016.

In the meantime, I will add you to our email distribution list so you can get information about the project as it becomes available. For more information on the Finch West LRT project, I recommend you visit the Metrolinx website where you can get some background information on the LRT line. In addition, I would suggest that if you have any other questions relating to this project, please feel free to contact us via email at FinchWest@metrolinx.com.

Thanks,

Robert
Finch West Community Relations Team

-----Original Message-----
From: [redacted]
Sent: Tuesday, March 31, 2015 8:56 AM
To: Gabriel Florez Lopez
Subject: RE:PARCEL OF LAND between Ookdale Rd& Yorkgate blvd

Dear Mr Lopez,
After much inquireing, i was directed to you as i was told you would be best to give me the information i need.
I live on Finch Ave West and just across the road from me i noted recently much activity including machinery stakes in ground ,work personnel being busy on the site. Because i live in close proxinity to that land (mentioned in subject above) ,Would you be kind enough to give me some information as to what is happening ? and any timeline of plans if possible?
Thanking you very much in advance and i very much look forward to hearing from you on this matter.
Regards,
[redacted]

From: Finch West <FinchWest@metrolinx.com>
Sent: Tuesday, July 07, 2015 2:02 PM
To: Amirsalari, Faranak
Cc: Les MacDermid; Morgan Rubes
Subject: FW: Status

From: Finch West
Sent: Friday, April 24, 2015 1:21 PM
To: [redacted]
Cc: Finch West
Subject: RE: Status

Hello [redacted]

Thank you for contacting the Finch West Community Relations team. The Finch West LRT project is expected to begin construction in 2016. Prior to this the environmental assessment for our Maintenance and Storage Facility (MSF) will be conducted. We started this process last year with an initial public open house and that should continue later this year.

If you would like, I can add you to our email distribution list so you can get project updates as they become available. Please let me know if you would be interested in this.

For more information on the Finch West LRT project, I recommend you visit the Metrolinx website.

Thanks,

Rob
Finch West Community Relations Team

-----Original Message-----
From: [redacted]
Sent: Wednesday, April 22, 2015 9:14 PM
To: Finch West
Subject: Status

What's the status of this project?

[redacted]

From: Finch West <FinchWest@metrolinx.com>
Sent: Tuesday, July 07, 2015 1:47 PM
To: Amirsalari, Faranak
Cc: Les MacDermid; Morgan Rubes
Subject: FW: Maintenance and Stoage Facility

From: Finch West
Sent: Tuesday, June 09, 2015 11:58 AM
To: Les MacDermid
Subject: FW: Maintenance and Stoage Facility

This is the response Rob (my colleague) gave.

I have sent [redacted] an invite to the POH.

From: Finch West
Sent: Friday, May 01, 2015 4:03 PM
To: [redacted]
Cc: Finch West
Subject: RE: Maintenance and Stoage Facility

Hi David,

Thanks for passing along this feedback. I will pass your comments along to our project team.

Rob

From: [redacted]
Sent: Friday, May 01, 2015 3:53 PM
To: Finch West
Subject: RE: Maintenance and Stoage Facility

Hello again Rob:
I have done a little further research, and the Toronto Official Plan confirms my thoughts. I see on Map 13 of the OP, this site is designated Mixed Use. The policies for Mixed Use areas do not mention facilities of this type. Instead, it mentions residential, commercial, retail, parks and open space. On map 16 of the OP I see that the existing MSF for TTC buses and subway cars at Wilson Avenue and Transit Road is designated an Employment Area (in other words, industrial). Thus, my conclusion would be that before the site at Finch and York Gate can be used for the MSF it will require an Official Plan Amendment. The current designation would not permit the MSF.
[redacted]

From: Finch West [mailto:FinchWest@metrolinx.com]
Sent: May-01-15 2:27 PM
To: [redacted]
Cc: Finch West
Subject: RE: Maintenance and Stoage Facility

Hello [redacted]

Thank you for contacting the Finch West Community Relations team. There are a few items I want to bring to your attention regarding your enquiry.

The Maintenance and Storage Facility (MSF) is still undergoing an EA to study and address the potential environmental effects of the MSF while recommending measures to mitigate any effects identified through our planning activities. The site on Finch Avenue between Norfinch Drive and York Gate Blvd was one of 4 sites considered. This site was selected as the optimal site for the MSF as it fit all the criteria needed for such a facility.

You can find more information about the MSF project on the Metrolinx website – a presentation from our previous open house last July is still up on the website that speaks to the MSF in a bit more detail.

You have not missed your opportunity to provide comment. We plan to hold another public open house sometime this summer – we don't have the exact date, but we will be communicating this soon. If you would like to stay up-to-date on what is happening with the Finch West LRT Project, we have an email list and would be happy to add you to it so you can get information on the project as it becomes available. Please let me know if you would like to be added to this list. In addition to this, we will pass along your comments to our project team to let them know of your concerns.

If you have any other questions about the Finch West LRT project, please do not hesitate to email us.

Thanks,

Rob
Finch West Community Relations Team

From: [redacted]
Sent: Friday, May 01, 2015 11:56 AM
To: Finch West
Subject: Maintenance and Stoage Facility

Hello:
I was pleased to see the announcement last week that the province is proceeding with construction of the Finch West LRT. I am a strong supporter of this project. However, it was only as a result of last week's announcement that I became aware that a maintenance and storage facility is being proposed for a vacant site on Finch just west of York Gate. Although I see that the public comment period has closed, I am going to comment anyway.
I am opposed to the choice of this site for this facility. While the site obviously meets operational requirements, I think it is inappropriate on the basis of land use. The MSF is basically an industrial use. It does not belong in this setting, adjacent to residential, retail commercial, office commercial and hospital uses. I think there are a lot of uses that site could be put to that would be more beneficial to the Jane/Finch community.
Please proceed as quickly as possible to build the Finch West LRT. But please select a different location for the MSF.

[redacted]

AECOM
5080 Commerce Boulevard
Mississauga, ON, Canada L4W 4P2
www.aecom.com

905 238 0007 tel
905 238 0038 fax

Communication Record

Date May 19, 2015

Time 10:30 am

Between

and

Telephone # [redacted]

Project #

Project Name Finch MSF EA

Subject Questions related to EA

PLEASE NOTE: If this communication record does not agree with your records of the meeting, or if there are any omissions, please advise. Otherwise it will be assumed that the contents of this record are correct.

Comments

Questions surrounded the general status of the project and level of approval from City and Coucillors. It was identified that recent announcements from the Province and the master agreement between the City, Metrolinx and TTC confirms approval of the project, but the member of the public was encouraged to discuss with local councillor and to attend the public Open house which will be advertised in the near future.

Blacha, Madelin

From:	Pettigrew, Renee
Sent:	Wednesday, May 20, 2015 11:31 AM
To:	Amirsalari, Faranak; Blacha, Madelin
Subject:	Fw: Request to be added to the Mailing list.
Follow Up Flag:	Follow up
Flag Status:	Flagged

From: Les MacDermid <Les.MacDermid@metrolinx.com>
Sent: Tuesday, May 19, 2015 2:21 PM
To: Joanna Hui; Pettigrew, Renee
Subject: Request to be added to the Mailing list.

Please ensure that [redacted] is added to the Mailing List

Les MacDermid, P.Eng.
Senior Project Manager – Systems and MSF
Sheppard and Finch West LRT
Metrolinx Rapid Transit Implementation
5160 Yonge Street | Suite 300 | Toronto, ON | M2N 6L9
b 416.228.9392 m 416.816.5181 | www.metrolinx.com

From: [redacted]
Sent: Tuesday, May 19, 2015 2:16 PM
To: Les MacDermid
Subject: MSF

Hi Les,

Could you please add me to your mailing list. Am interested in the MSF impact.

Yours Truly,

[redacted]

From:	Amirsalari, Faranak
Sent:	Tuesday, July 07, 2015 3:48 PM
To:	Blacha, Madelin
Subject:	FW: Finch West Hub
Attachments:	FinchWest Public Open House Notice Final.pdf

From: Joanna Hui [mailto:Joanna.Hui@metrolinx.com]
Sent: July-07-15 3:44 PM
To: Amirsalari, Faranak
Cc: Les MacDermid; Morgan Rubes
Subject: FW: Finch West Hub

From: Joanna Hui
Sent: Tuesday, June 09, 2015 11:54 AM
To: [redacted]
Subject: RE: Finch West Hub

Hi [redacted]

We are hosting a public open house on June 24 to discuss the maintenance and storage facility (see attached). Please join us.

Regards,

Joanna Hui
Media Relations & Issues Specialist
METROLINX
20 Bay Street, Suite 600, Toronto, ON M5J 2W3
416-869-3600 X 5739
Joanna.Hui@metrolinx.com

From: Finch West
Sent: Tuesday, June 09, 2015 11:44 AM
To: Joanna Hui
Subject: FW: Finch West Hub

From: [redacted]
Sent: Tuesday, June 02, 2015 2:44 PM
To: Finch West
Subject: Finch West Hub

Hello,
Being a resident of Etobicoke North...specifically across the street from Humber College..I would like to know where the station is being built.

Regards,
[redacted]

From: Finch West <FinchWest@metrolinx.com>
Sent: Tuesday, July 07, 2015 2:03 PM
To: Amirsalari, Faranak
Cc: Les MacDermid; Gabriel Florez Lopez
Subject: FW: Finch West Maintenance and Storage Facility

From: Finch West
Sent: Thursday, May 21, 2015 2:40 PM
To: [redacted]
Cc: Finch West
Subject: RE: Finch West Maintenance and Storage Facility

Hello [redacted]

Thank you for reaching out to the Finch West Community Relations Team. At this point in time, this email address is the best point of contact for any questions/enquiries regarding the Finch West LRT project. We plan on having another open house in the area sometime in June. Please stay tuned for that. In the meantime, details on the maintenance and storage facility, and the project itself, can be found on the Metrolinx website. In addition, I will add your email address to our distribution list so you receive project information as it becomes available.

Robert
Finch West Community Relations Team

From: [redacted]
Sent: Thursday, May 21, 2015 8:36 AM
To: Finch West
Subject: Finch West Maintenance and Storage Facility

Hello Metrolinx,

In regards to the planned Finch West Maintenance and Storage Facility. Please provide us with more information and a point of contact in regards to the project that is across the street from our 31 Division – Police Station.

Sincerely,

[redacted]

Blacha, Madelin

From: Pettigrew, Renee
Sent: Monday, June 08, 2015 9:19 AM
To: Les MacDermid; Morgan Rubes; Jamie Robinson; Joanna Hui; Amirsalari, Faranak; Blacha, Madelin
Subject: Fw: Finch West Maintenance and Storage Facility Environmental Assessment - Notice of Public Open House #2

From: [redacted]
Sent: Saturday, June 6, 2015 7:25 AM
To: Pettigrew, Renee
Subject: RE: Finch West Maintenance and Storage Facility Environmental Assessment - Notice of Public Open House #2

Thank you! We're letting everyone we know in the community know about the June 24th open house.

[redacted]

From: Pettigrew, Renee [mailto:Renee.Pettigrew@aecom.com]
Sent: Friday, June 05, 2015 5:14 PM
To: [redacted]
Cc: Les MacDermid
Subject: Finch West Maintenance and Storage Facility Environmental Assessment - Notice of Public Open House #2

On behalf of Les MacDermid, P.Eng., Metrolinx Senior Project Manager for the Finch West LRT Maintenance and Storage Facility project in the City of Toronto, I am sending you the attached Notice to invite a representative of your organization to attend a Public Open House on June 24, 2015 regarding the Maintenance and Storage Facility for the Finch West Light Rail Transit Project.

The Project
Metrolinx is undertaking an Environmental Assessment (EA) Study under the Transit Project Assessment Process (TPAP) for the construction and operation of a Maintenance and Storage Facility (MSF) for Finch West Light Rail Transit (LRT) Project. The MSF is considered a necessary component of the Finch West LRT line that was subject to an EA conducted under the TPAP in 2010. The MSF was not evaluated under the 2010 TPAP and the EA for the Finch West MSF site is now underway. A summary of previous consultation and additional project information can be found on project website at www.metrolinx.com/finchwest.

Process

The environmental impacts of this transit project will be assessed according to the TPA Process as prescribed in Ontario Regulation 231/08 under the Ontario *Environmental Assessment Act*. As part of the TPAP, an Environmental Project Report is being prepared. The Notice of Commencement for the TPAP for the Finch West MSF was issued in May 2015.

Consultation
Public consultation is a vital component to this Project. Building on the first Public Open House held in July 2014, the second Public Open House is being held to present the preferred conceptual design of the MSF, present the recommended mitigation measures and monitoring to minimize the environmental effects of the project, and to outline commitments to future works. Representatives from the Project team will be available to answer questions and obtain your input. Please refer to the enclosed Notice for additional details.

The Public Open House will be held as follows:

Date: Wednesday, June 24, 2015
Time: 7:00 PM to 9:00 PM
Location: St. Wilfrid Catholic School Gym (1685 Finch Avenue West)

As a nearby property owner or interested party, you are encouraged to attend the Public Open House to provide your views and comments so they can be considered. Should you have any questions or comments about this Project or if you require additional information, please contact Renée Pettigrew, MCIP, RPP (Manager, Impact Assessment and Permitting) at renee.pettigrew@aecom.com. Comments may also be submitted on our Project website at www.metrolinx.com/finchwest or through our Project e-mail address at finchwest@metrolinx.com.

Thank you for your interest in this important transit investment in the City of Toronto.

Renée Pettigrew, MCIP, RPP
Manager, Impact Assessment and Permitting
Environment
renee.pettigrew@aecom.com

AECOM
5080 Commerce Blvd
Mississauga, ON L4W 4P2
T 905.712.7077 C 416.575.1719
www.aecom.com

From: Amirsalari, Faranak
Sent: Monday, June 08, 2015 10:47 PM
To: Blacha, Madelin
Cc: Pettigrew, Renee
Subject: FW: Finch West MSF - Community Principles
Attachments: CAPG_Finch MSF-Letter to Metrolinx-05.26.15.pdf; CAPG_Finch MSF-Principles.pdf

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From: Les MacDermid [mailto:Les.MacDermid@metrolinx.com]
Sent: June-08-15 8:25 AM
To: Morgan Rubes; Pettigrew, Renee; Amirsalari, Faranak
Subject: FW: Finch West MSF - Community Principles

FYI,

Les

Les MacDermid, P.Eng.
Senior Project Manager – Systems and MSF
Sheppard and Finch West LRT
Metrolinx Rapid Transit Implementation
5160 Yonge Street | Suite 300 | Toronto, ON | M2N 6L9
b 416.228.9392 m 416.816.5181 | www.metrolinx.com

From: Jamie Robinson
Sent: Monday, June 08, 2015 8:17 AM
To: Les MacDermid
Cc: Joanna Hui; Gabriel Florez Lopez; Teresa Ko
Subject: FW: Finch West MSF - Community Principles

From: Clara Stewart-Robertson [mailto:clarasr@janefinchcentre.org]
Sent: June-07-15 10:15 AM
To: Jamie Robinson
Subject: Finch West MSF - Community Principles

Dear Mr. Robinson,

I am writing on behalf of the Community Action Planning Group-York West (CAPG) with regard to the Finch West Maintenance Storage Facility. CAPG is made up of residents, workers, and supporters from the Jane-Finch area, who are working together to mobilize our local communities around urban planning and development issues.

The proposed MSF presents undeniable opportunities for change in our Jane-Finch community, given its central and highly visible location on Finch Avenue West. For this reason, we have generated seven key principles for ensuring that the project makes a positive impact not only on our built environment, but also on the social and economic fabric of our community. Please see the attached document for a description of each principle.

We look forward to discussing these principles with you in the very near future, either through an audience at your office or through your presence at one of our monthly CAPG meetings. Please feel free to email one of our co-chairs, Robert McElhinney at bdmce@bell.net or myself at clarasr@janefinchcentre.org.

Many thanks,
Clara Stewart-Robertson
Co-Chair, CAPG

--
Clara Stewart-Robertson
Manager, Green Change
Jane/Finch Community and Family Centre
Email: clarasr@janefinchcentre.org
Tweet: @OurGreenChange @clarastewrob
Visit us: https://www.facebook.com/GreenChangeProject

July 21, 2015

Ms. Clara Stewart-Robinson
Jane/Finch Community and Family Centre
108-4400 Jane Street
Toronto, ON
M3N 2K4

Ms. Stewart-Robinson,

Re: Finch West MSF – Community Principles

Thank you for your letter dated May 26, 2015 and email dated June 7, 2015, in which you describe the purpose of the CAPG and the seven key principles developed for the project, and request a meeting with the Metrolinx project team to discuss this further.

Your correspondence will be included in the consultation record for the EA, which Metrolinx intends to file for public and agency review on July 31, 2015. As a key stakeholder, a Notice of Completion will be sent to the CAPG detailing where the final Environmental Project Report (EPR) will be available for review.

Metrolinx is supportive of the seven key principles suggested by the CAPG, and this will be reflected in the development of a Request for Proposals (RFP) for the design and construction of the Finch West MSF. To this end, our project team will be meeting with the CAPG on August 11, 2015, to discuss how this may be achieved. We look forward to discussing these principles further.

Thank you again for your interest in this project.

Sincerely,

Jamie Robinson
Director of Community Relations and Communications
Rapid Transit
Metrolinx

CAPG
York West

May 26, 2015

Jamie Robinson
Director, Community Relations and Communications
Rapid Transit, Capital Projects Group
Metrolinx
20 Bay Street, Suite 600
Toronto, ON M5J 2W3

RE: Finch LRT Maintenance Storage Facility

Dear Mr. Robinson,

On behalf of the Community Action Planning Group-York West (CAPG), thank you for meeting with us last year and, more recently, for sharing the Notice of Commencement for the Finch West Maintenance Storage Facility (MSF) environmental assessment (EA) process.

Securing increased investment in transit infrastructure and improving transit equity are vitally important to our Jane-Finch community and many other communities along the Finch West LRT corridor. The proposed MSF presents undeniable opportunities for change in our community, given its central and highly visible location on Finch Avenue West. For this reason, CAPG is putting forward seven key principles for ensuring that the project makes a positive impact not only on our built environment, but also on the social and economic fabric of our community.

CAPG is made up of residents, workers, and supporters from the Jane-Finch area, who are working together to mobilize local communities to take action on urban planning and development issues. As a group, our members have generated the following principles for the MSF with regard to community engagement, social benefits, planning, and urban design. Please see the attached document for a description of each principle.

1. Community Engagement and Inclusion
2. Community Benefits
3. Environmental Impact and Sustainability
4. Additional Uses
5. Street Frontage
6. Physical Connections
7. Design Excellence

While we have laid out these principles as a set of recommendations, CAPG feels strongly that Metrolinx should support and include them in any Request for Proposals for the design and construction of the MSF.

As part of our partnership with the Toronto Community Benefits Network and our commitment to seeing a community benefits program developed for the entire Finch West LRT project, we will also be sending them a copy of these principles.

Taking into consideration the timing of the EA and the new estimated start date for the construction of the Finch West line, we would like to discuss these principles with you in the very near future, either through an audience at your office or through your presence at one of our monthly CAPG meetings. To expedite this process, please feel free to email one of our co-chairs, Robert McElhinney at bdmce@bell.net or Clara Stewart-Robertson at clarasr@janefinchcentre.org.

We look forward to hearing from you.

Sincerely,

R. McElhinney

Robert McElhinney
Co-chair, CAPG

C Stewart-Robertson

Clara Stewart-Robertson
Co-chair, CAPG

Enclosure

cc: Al Rezoski, Manager, Community Planning – North York District
Councillor Anthony Perruzza (Ward 8)
Councillor Georgio Mammolitte (Ward 7)
Councillor Vincent Crisanti (Ward 1)
Mario Sergio, MPP (York West)

Finch West Light Rail Transit Project: Proposed Principles for the Maintenance Storage Facility

The following principles have been generated by members of the Community Action Planning Group-York West (CAPG) - A group of residents, workers, and supporters from the Jane-Finch area that aims to mobilize local communities to take action on urban planning and development issues. This document was inspired by our recent conversations with the Toronto Community Benefits Network and by a consultation process that led to similar development principles being created for Metrolinx's Maintenance Storage Facility (MSF) in Mount Dennis, as part of the Eglinton Crosstown line.

We have envisioned these seven key principles as a starting point for what we hope will be a much broader discussion between Metrolinx and the community organizations and residents who will be impacted by the construction of the MSF on Finch Avenue West. While they are specifically intended to help guide the pending environmental assessment for the MSF, and later any Request for Proposals (RFP) for its design and maintenance, we also hope that the proposed principles act as basis of direction for the delivery of a community benefits program for the entire Finch West Light Rail Transit (LRT) project.

1. Community Engagement and Inclusion

Prior to the selection of the successful proponent, Metrolinx should develop and implement an engagement plan that covers all stages of the design and development of the Finch MSF.

- In collaboration with community members, local organizations, and other stakeholders, Metrolinx should create an engagement plan that outlines the principles as well as a schedule for regular communication between the successful proponent and local communities.
- This plan should also clarify the role of community members and other stakeholders in decision-making processes related to the MSF, in order to ensure transparency and accountability throughout all stages of the facility's design and development, including the selection of the successful proponent.
- Metrolinx should use a variety of engagement activities and tools to support the increased participation of residents from low-income, racialized, newcomer, and other equity seeking communities; people with disabilities; as well as youth and women who are disadvantaged.
- All proponents should engage with the Jane-Finch community as a whole, including identified community leaders, City staff, and local councillors, prior to submitting their final responses to Metrolinx's RFP.

2. Community Benefits

Metrolinx should work closely with the proponents, Infrastructure Ontario, and local partners to ensure that benefits are provided through the design, development, and operation of the MSF.

- In consultation with community groups, institutions, and residents along the Finch LRT corridor, Metrolinx should adapt its existing community benefits program for the Eglinton Crosstown line to reflect the diverse perspectives, priorities, and interests of the surrounding communities.
- A Community Benefits Agreement for the Finch LRT and MSF should offer a range of employment, training, apprenticeship, and local procurement opportunities for residents, businesses, and social enterprises. These opportunities should be targeted toward historically disadvantaged communities and equity seeking groups, including residents of Neighbourhood Improvement Areas and other low-income neighbourhoods, racialized and newcomer communities, people with disabilities, as well as women and youth.
- Other community benefits, such as a new arts and culture centre or community meeting space, should be considered through the provision of additional uses at the site, where possible.

3. Environmental Impacts and Sustainability

The MSF should be designed and developed to a high environmental standard, in order to minimize its overall impact on the surrounding neighbourhood.

- The design, construction, and long-term performance of the MSF should meet, and where possible exceed, Toronto's current green building standards.
- Metrolinx and the successful proponent should work together with the appropriate regulatory bodies, City staff, and community groups to reduce any potential negative environmental impacts of the MSF, including: increased air, light, and noise pollution; increased urban heat island effect; disposal of waste products; loss of green space; etc.
- Through the environmental assessment for the MSF and the subsequent design process, Metrolinx should address local concerns around traffic engineering for the site, in particular the number of access points and turning lanes for LRT and maintenance vehicles, potential impacts from employee parking and increased congestion, as well as pedestrian and bicycle safety. Any design solutions should also consider the fact that Finch Avenue is a designated hazardous materials route between Highway 400 and the petroleum tank farms on Keele Street.

4. Opportunities for Additional Uses

Proponents should propose a design and development approach that minimizes the footprint of the MSF, while considering a range of uses on the lands, particularly along Finch Avenue West and Yorkgate Boulevard.

- The required functional and technical MSF components, including employee parking, should be concentrated on the site to minimize their overall footprint and create opportunities for a range of additional uses.
- These uses could include, but are not limited to, office, institutional, retail, and community uses, and could be either one or two storeys in scale. Any introduced uses should reflect the needs of the surrounding communities and be made compatible with a 24-hour operating MSF.

5. Street Frontage

Proponents should apply creative approaches to the design and development of the Finch Avenue West and Yorkgate Boulevard frontages with respect to at-grade uses, architectural treatment, as well as streetscape and other public realm improvements.

- In anticipation of future growth and intensification along Finch Avenue West, the proposed development should actively address this street frontage with other compatible uses and through the application of more transparent materials at grade level.
- The Yorkgate Boulevard frontage should be designed in a manner that would provide for, and not preclude, any future redevelopment of the Yorkgate Mall lands into a higher density, mixed-use site. The design should also protect the potential for Yorkgate Boulevard to become a more pedestrian friendly street with connections to existing and future active transportation networks.
- Proponents should take advantage of any opportunities for greening and/or new public amenities on Finch Avenue West and Yorkgate Boulevard.

6. Physical Connections

Proponents should take an integrated approach to the design and development of the MSF lands with respect to the surrounding urban context.

- Given the central location of the site in the Jane-Finch neighbourhood and its proximity to local employment lands, commercial and retail spaces, community services, established residential areas, and green space, Metrolinx and the proponents should ensure that the MSF respects and supports its neighbours.

- Proponents should consider the sports fields and Finch Hydro Corridor Bike Trail on the north side of the site as valuable community amenities and incorporate solutions to reduce any negative impacts, such as the provision of a setback to accommodate future greening or open space.
- The development should respect and enhance the existing transportation, cycling, and pedestrian routes around the site, while anticipating future improvements to this network.
- In general, vehicle access should be carefully orchestrated to protect the safety and movement of both pedestrians and cyclists, and to avoid creating additional divisions and barriers around the site for local communities.

7. Design Excellence

Proponents should adopt design excellence as part of their responses to all aspects of the development of the MSF.

Like hundreds of other apartment neighbourhoods across the GTA, Jane and Finch suffers from a built environment which was poorly conceived with a now outmoded idea about separating land uses and which continues decades later to present barriers for neighbourhood investment, local economic development, and other community development initiatives. Given its location in the heart of the community, the MSF site presents a significant opportunity to demonstrate the potential to achieve high quality urban design despite these existing conditions and to set a new architectural precedent for future developments in the neighbourhood.

- To achieve design excellence, the proposed development should be completed by a team of qualified architects with experience in executing innovative transit facilities and thoughtful urban design projects.
- By working with their design partners, proponents should also seek to set new standards in sustainable development at all stages of the project.
- Toronto’s Design Review Panel should be consulted at appropriate times during the design and approval processes, as coordinated by City staff. Proponents should be strongly encouraged to take into consideration all of the Panel’s comments.

Blacha, Madelin

From:	Amirsalari, Faranak
Sent:	Monday, June 15, 2015 3:14 PM
To:	Blacha, Madelin
Cc:	Pettigrew, Renee
Subject:	FW: MSF inquiry

From: Les MacDermid [mailto:Les.MacDermid@metrolinx.com]
Sent: June-15-15 3:08 PM
To: Joanna Hui
Cc: Pettigrew, Renee; Amirsalari, Faranak
Subject: RE: MSF inquiry

I was able to discuss with [redacted]

Her concern focused on traffic impact around the MSF and reasons for selecting the site. I re-iterated that the site was selected based on size and proximity to the Finch Line. Alternate sites were identified during the initial selection and that the site was chosen based on meeting the size and proximity requirements.

It was explained that the traffic impacts have been assessed and modeling done based on known and predicted traffic volumes in the area, with the majority of movements being done outside peak hours, there is negligible traffic impacts in the area due to the MSF. We discussed the purpose of the MSF and the types of work that would be involved.

In general I helped her understand the project although she did express concerns due to construction impacts but understood that may be required in order to build the system.

Regards,

Les

Les MacDermid, P.Eng.
Senior Project Manager – Systems and MSF
Sheppard and Finch West LRT
Metrolinx Rapid Transit Implementation
5160 Yonge Street | Suite 300 | Toronto, ON | M2N 6L9
b 416.228.9392 m 416.816.5181 | www.metrolinx.com

From: Joanna Hui
Sent: Tuesday, June 09, 2015 11:41 AM
To: Les MacDermid
Cc: Jamie Robinson
Subject: MSF inquiry

Hi Les, please call [redacted] at [redacted] She has questions about why the site was chosen. She works (but doesn't live) in the area.

Thank you

Joanna Hui
Media Relations & Issues Specialist
METROLINX
20 Bay Street, Suite 600, Toronto, ON M5J 2W3
416-869-3600 X 5739
Joanna.Hui@metrolinx.com

A6. Agency Consultation

From:	Pettigrew, Renee
Sent:	Thursday, May 14, 2015 1:14 PM
To:	'Battarino, Gavin (MOECC)'
Subject:	RE: Finch West Maintenance and Storage Facility Project

Thanks Gavin,
Metrolinx will ensure that a hard copy is sent to the Director at the address indicated below this week.

Renée Pettigrew, MCIP, RPP
Manager, Impact Assessment and Permitting
Environment
renee.pettigrew@aecom.com

AECOM
5080 Commerce Blvd
Mississauga, ON L4W 4P2
T 905.712.7077 C 416.575.1719
www.aecom.com

From: Battarino, Gavin (MOECC) [mailto:Gavin.Battarino@ontario.ca]
Sent: Tuesday, May 12, 2015 12:53 PM
To: Pettigrew, Renee
Subject: RE: Finch West Maintenance and Storage Facility Project

Reneé,

Thank you for notifying the Ministry of the Notice of Commencement for the Finch West Light Rail Transit Maintenance and Storage Facility. The Ministry understands that this Notice of Commencement was first published publicly on May 15, 2015 in the Downsview Advocate, the Metro News Toronto, and the 24 Hours Toronto newspapers officially starting the 120-day environmental project report (EPR) development period under the transit project assessment process. The period ends on September4, 2015 , and the Ministry expects that the Notice of Completion for this project will be issued on or before this date.

I would like to take this opportunity to kindly request that a hard copy of the Notice and cover letter be submitted to the Director of the Ministry's Environmental Approvals Branch (new address below).

Should you have any further questions related to Ontario Regulation 231/08 and its requirements, please feel free to contact me at your earliest convenience

Yours sincerely,

Gavin Battarino
Environmental Approvals Branch
Ontario Ministry of the Environment and Climate Change

1st Floor, 135 St. Clair Avenue West
Toronto ON M4V 1P5

From: Pettigrew, Renee [mailto:Renee.Pettigrew@aecom.com]
Sent: May-12-15 12:08 PM
To: Battarino, Gavin (MOECC)
Cc: Jason Ryan; Tania Baynova; Les MacDermid; Morgan Rubes (Morgan.Rubes@metrolinx.com); Duggan, Scott; Amirsalari, Faranak
Subject: Finch West Maintenance and Storage Facility Project

Mr. Gavin Battarino
Special Project Officer
Environmental Approvals Branch – Ministry of the Environment and Climate Change (MOECC)

Dear Mr. Gavin Battarino:

Re: Finch West Maintenance and Storage Facility Project – Notice of Commencement

Attached for your information is the Notice of Commencement) for the Finch West Light Rail Transit Maintenance and Storage Facility. The Notice will be published in the Downsview Advocate, Metro News Toronto, and 24 Hours Toronto on May 15, 2015 and in North York Mirror on May 21, 2015. Metrolinx will be hosting a Public Open House (POH#2) in Mid-June.

Metrolinx is targeting July 19, 2015 to prepare and distribute the Notice of Completion of the Environmental Project Report. As per section 6.(2)(a) of Regulation 231/08, this date falls within the 120 day period since the first day on which the Notice of Commencement of the Transit Project Assessment Process was published. The 120-day period expires September 4, 2015.

On April 21, 2015 we provided responses to your comments on the Draft EPR in a consolidated Review Comments Table. We look forward to scheduling a meeting shortly to address the outstanding Technical Reviewer's comments with respect to Noise and Vibration and Air Quality prior to finalization of the EPR.

Should you have any questions or concerns, and to set up the Technical Review meeting, please feel free to contact me at (905) 712-7077.

Sincerely,

Renée Pettigrew, MCIP, RPP
Manager, Impact Assessment and Permitting
Environment
renee.pettigrew@aecom.com

AECOM
5080 Commerce Blvd
Mississauga, ON L4W 4P2
T 905.712.7077 C 416.575.1719
www.aecom.com

A7. Aboriginal Consultation

From: David Veights <David.Veights@metrolinx.com>
Sent: Friday, November 07, 2014 1:01 PM
To: Battarino, Gavin (ENE)
Subject: RE: Finch West MSF - Aboriginal Consultation

Thanks Gavin.

Absolutely.

We have an earlier list; I want to be assured that our list is up to date.

David

From: Battarino, Gavin (ENE) [mailto:Gavin.Battarino@ontario.ca]
Sent: Friday, November 07, 2014 12:59 PM
To: David Veights
Subject: RE: Finch West MSF - Aboriginal Consultation

David,

In response to your request please refer to the Ministry's website on Aboriginal consultation for a list of bodies that would be able to assist in identifying aboriginal communities that may be interested in the Finch West Maintenance and Storage Facility Project. The website can be found at the following link:

http://www.ontario.ca/government/environment-assessments-consulting-aboriginal-communities

Please be advised, that proponents should be well aware of the Aboriginal communities that may be interested in a transit project before starting the time-limited transit project assessment process or issuing any notices.

If you have any question or concerns please let me know.

Thank you,

Gavin Battarino, Special Project Officer
Environmental Approvals Branch
Ministry of the Environment and Climate Change
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario M4V 1L5

Phone: (416)212-4279
Fax: (416)314-8452

From: David Veights [mailto:David.Veights@metrolinx.com]
Sent: November-07-14 12:34 PM
To: Battarino, Gavin (ENE)
Subject: Finch West MSF - Aboriginal Consultation

Hello Gavin.

In accordance with Section 7 (4)(a) of Ontario Regulation 231/08, please consider this message as our formal request to the Environmental Approvals Branch for a list of bodies that would be able to assist in identifying aboriginal communities that may be interested in the Finch West Maintenance and Storage Facility (MSF) Project.

Please feel free to contact me if you have any questions.

Thank you.

David Veights, AICP, PMP
Environmental Assessment Project Manager | Third Party, Utilities and Property | Capital Projects Group
METROLINX | 5160 Yonge Street, Suite 300 | Toronto, Ontario| M2N 6L9
Direct Line: (416) 228-9339 | Fax: (416) 228-9272 | david.veights@metrolinx.com

From: Blacha, Madelin
Sent: Thursday, July 16, 2015 4:06 PM
To: Blacha, Madelin
Subject: FW: Finch MSF EPR - list of Aboriginal Communities from MOECC Director

From: David Veights
Sent: January-29-15 2:08 PM
To: Tania Baynova
Cc: Les MacDermid
Subject: RE: Finch MSF EPR - list of Aboriginal Communities from MOECC Director

Good afternoon Tania.

I hope your transition to your new job is a smooth transition. Congrats again!

In response to your request, back in November, I sent via e-mail to Gavin a request for a list of bodies that would be able to assist in identifying aboriginal communities that may be interested in the Finch West Maintenance and Storage Facility (MSF) Project. I have attached the e-mail chain that I had with Gavin regarding the matter.

When I received Gavin's response, I clicked the link in his e-mail message for the federal Aboriginal and Treaty Right Information System through Aboriginal Affairs and Northern Development Canada. Once in the system, I searched by place name "North York". The search gave me the following seven communities:

- Alderville First Nation
- Beausoleil
- Chippewas of Georgina Island
- Chippewas of Rama First Nation
- Curve Lake
- Hiawatha First Nation
- Mississauga's of Scugog Island First Nation

I then sent an e-mail message to the provincial Ministry of Aboriginal Affairs (MAA) as stated in the page sent by Gavin. Attached is that message that I sent to MAA – to date, I have not received a response.

I hope this helps. Let me know if you need anything else.

David Veights, AICP, PMP
Environmental Assessment Project Manager | Third Party, Utilities and Property | Capital Projects Group
METROLINX | 5160 Yonge Street, Suite 300 | Toronto, Ontario| M2N 6L9
Direct Line: (416) 228-9339 | Fax: (416) 228-9272 | david.veights@metrolinx.com

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From: Tania Baynova
Sent: Thursday, January 29, 2015 1:22 PM
To: David Veights
Subject: Finch MSF EPR - list of Aboriginal Communities from MOECC Director

Hi David,

It was nice speaking with you this afternoon. Below is my new contact information.

As mentioned on the phone, could you please send me the communication letter that you had sent to the MOECC Director requesting the list of Aboriginal communities that need to be contacted as part of the TPAP and the response you received from MOECC?

Thanks very much.
Tania

Tania Baynova, MASc, BES
Environmental Project Manager
Environmental Programs and Assessment, Capital Projects Group
| 416-869-3600 x5623 | 20 Bay St. Suite 600, Toronto, ON M5J 2W3 |

From:	Pettigrew, Renee
Sent:	Thursday, May 14, 2015 2:08 PM
To:	'allison.berman@inac-ainc.gc.ca'
Cc:	'Les MacDermid'
Subject:	Finch West Maintenance and Storage Facility Environmental Assessment - City of Toronto - Notice of Commencement
Attachments:	Finch West MSF Notice of Commencement.pdf

Ms. Allison Berman – Program Officer: Consultation and Accommodation Unit, Aboriginal Affairs and Northern Development Canada

On behalf of Les MacDermid, P.Eng., Metrolinx Senior Project Manager for the Finch West LRT Maintenance and Storage Facility project in the City of Toronto, I am sending you the attached Notice regarding the Commencement of the Transit Project Assessment Process for the Maintenance and Storage Facility Environmental Assessment for the Finch West Light Rail Transit System.

The Project
Metrolinx is initiating an Environmental Assessment (EA) Study under the Transit Project Assessment Process (TPAP) for the construction and operation of a Maintenance and Storage Facility to provide maintenance service and storage tracks for the new light rail vehicles (LRV) servicing the Finch West Light Rail Transit (LRT) Project. The Maintenance and Storage Facility is considered a necessary component of the Finch West LRT Project that was subject to an EA conducted under the TPAP in 2010; however the Environmental Project Report did not include the MSF. Accordingly, the EA for the Finch West MSF site is now underway and will follow the TPAP Process.

Process
The environmental impacts of this transit project will be assessed according to the TPA Process as prescribed in Ontario Regulation 231/08 made under the Ontario *Environmental Assessment Act*. As part of the TPAP, an Environmental Project Report is being prepared.

Aboriginal Engagement
Aboriginal engagement is a vital component to this project. Building on the Public Open House (POH) that was held in July 2014, the Project team will continue to engage and consult Aboriginal communities and other interested parties throughout the TPAP. Metrolinx will be hosting another POH (#2) in June. A separate Notice will be published shortly for additional details.

The Project Team is requesting your assistance in determining the Aboriginal interests or treaty rights pertaining to the proposed project. We have consulted the Aboriginal and Treaty Rights Information System (ATRIS) to develop our list of primary contacts to engage and consult. We are requesting that you review the below Aboriginal Engagement Project Contact List, and provide any relevant information you may have regarding their rights, interests and assertions.

Please confirm our list to ensure we engage with the appropriate communities for the purposes of this study. A reply by May 28, 2015 would be much appreciated. Your input and feedback is important to us as we prepare to engage with area Aboriginal communities.

Grand Chief Konrad Sioui	Huron-Wendat First Nation	255 Place Chef Michel Laveau	Wendake, QC G0A 4V0
Chief James Marsden	Alderville First Nation	11696 2nd Line Road, P.O. Box 46	Alderville, ON K0K 2X0

Chief Roland Monague	Beausoleil First Nation	11 Ogemaa Miikaan	Christian Island, ON L0K 1C0
Chief Donna Big Canoe	Chippewas of Georgina Island	RR2, Box-13	Sutton West, ON L0E 1R0
Chief Greg Cowie	Hiawatha First Nation	123 Paudash Street, RR2	Hiawatha, ON K9J 0E6
Chief Kelly LaRocca	Mississaugas of Scugog Island First Nation	22521 Island Road	Port Perry, ON L9L 1B6
Chief Sharon Stinson Henry	Chippewas of Mnjikaning (Rama)	5884 Rama Road, Suite 200	Rama, ON L0K 1T0
Chief Phyllis Williams	Curve Lake First Nation	22 Winookeeda Road	Cruve Lake, ON K0L 1R0
Mr. Aly N. Alibhai	Métis Nation of Ontario	75 Sherbourne Street, Suite 311	Toronto, ON M5A 2P9

If you require additional information, please contact Renée Pettigrew, Manager, Impact Assessment and Permitting at renee.pettigrew@aecom.com. Comments may also be submitted on our Project website at www.metrolinx.com/finchwest or through our Project e-mail address at finchwest@metrolinx.com.

On behalf of the Project Team, thank you for your interest and partnership in this important transit investment in the City of Toronto.

Yours sincerely,

Renée Pettigrew, MCIP, RPP
Manager, Impact Assessment and Permitting
Environment
renee.pettigrew@aecom.com

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Mississauga, ON L4W 4P2
T 905.712.7077 C 416.575.1719
www.aecom.com

Blacha, Madelin

From: Pettigrew, Renee
Sent: Thursday, May 14, 2015 2:09 PM
To: 'corwin.troje@ontario.ca'
Cc: 'Les MacDermid'
Subject: Finch West Maintenance and Storage Facility Environmental Assessment - City of Toronto - Notice of Commencement
Attachments: Finch West MSF Notice of Commencement.pdf

Corwin Troje - Acting Manager - Consultation Unit, Ministry of Aboriginal Affairs

On behalf of Les MacDermid, P.Eng., Metrolinx Senior Project Manager for the Finch West LRT Maintenance and Storage Facility project in the City of Toronto, I am sending you the attached Notice regarding the Commencement of the Transit Project Assessment Process for the Maintenance and Storage Facility Environmental Assessment for the Finch West Light Rail Transit System.

The Project
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Aboriginal Engagement
Aboriginal engagement is a vital component to this project. Building on the Public Open House (POH) that was held in July 2014, the Project team will continue to engage and consult Aboriginal communities and other interested parties throughout the TPAP. Metrolinx will be hosting another POH (#2) in June. A separate Notice will be published shortly for additional details.

The Project Team is requesting your assistance in determining the Aboriginal interests or treaty rights pertaining to the proposed project. We have consulted the Aboriginal and Treaty Rights Information System (ATRIS) to develop our list of primary contacts to engage and consult. We are requesting that you review the below Aboriginal Engagement Project Contact List, and provide any relevant information you may have regarding their rights, interests and assertions.

Please confirm our list to ensure we engage with the appropriate communities for the purposes of this study. A reply by May 28, 2015 would be much appreciated. Your input and feedback is important to us as we prepare to engage with area Aboriginal communities.

Grand Chief Konrad Sioui	Huron-Wendat First Nation	255 Place Chef Michel Laveau	Wendake, QC G0A 4V0
Chief James Marsden	Alderville First Nation	11696 2nd Line Road, P.O. Box 46	Alderville, ON K0K 2X0

Chief Roland Monague	Beausoleil First Nation	11 Ogemaa Miikaan	Christian Island, ON L0K 1C0
Chief Donna Big Canoe	Chippewas of Georgina Island	RR2, Box-13	Sutton West, ON L0E 1R0
Chief Greg Cowie	Hiawatha First Nation	123 Paudash Street, RR2	Hiawatha, ON K9J 0E6
Chief Kelly LaRocca	Mississaugas of Scugog Island First Nation	22521 Island Road	Port Perry, ON L9L 1B6
Chief Sharon Stinson Henry	Chippewas of Mnjikaning (Rama)	5884 Rama Road, Suite 200	Rama, ON L0K 1T0
Chief Phyllis Williams	Curve Lake First Nation	22 Winookeeda Road	Cruve Lake, ON K0L 1R0
Mr. Aly N. Alibhai	Métis Nation of Ontario	75 Sherbourne Street, Suite 311	Toronto, ON M5A 2P9

If you require additional information, please contact Renée Pettigrew, Manager, Impact Assessment and Permitting at renee.pettigrew@aecom.com. Comments may also be submitted on our Project website at www.metrolinx.com/finchwest or through our Project e-mail address at finchwest@metrolinx.com.

On behalf of the Project Team, thank you for your interest and partnership in this important transit investment in the City of Toronto.

Yours sincerely,

Renée Pettigrew, MCIP, RPP
Manager, Impact Assessment and Permitting
Environment
renee.pettigrew@aecom.com

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5080 Commerce Blvd
Mississauga, ON L4W 4P2
T 905.712.7077 C 416.575.1719
www.aecom.com

Please consider the environment before printing this e-mail.

From:	Pettigrew, Renee
Sent:	Friday, June 05, 2015 5:11 PM
To:	'EACoordination_ON@inac-ainc.gc.ca'
Cc:	'Les MacDermid'
Subject:	Finch West Maintenance and Storage Facility Environmental Assessment - Notice of Public Open House #2
Attachments:	Finch West MSF TPAP - POH #2.pdf; Finch West MSF TPAP - Notice of Commencement.pdf

On behalf of Les MacDermid, P.Eng., Metrolinx Senior Project Manager for the Finch West LRT Maintenance and Storage Facility project in the City of Toronto, I am sending you the attached Notice to invite a representative of your organization to attend a Public Open House on June 24, 2015 regarding the Maintenance and Storage Facility for the Finch West Light Rail Transit Project.

The Project
Metrolinx is undertaking an Environmental Assessment (EA) Study under the Transit Project Assessment Process (TPAP) for the construction and operation of a Maintenance and Storage Facility (MSF) for Finch West Light Rail Transit (LRT) Project. The MSF is considered a necessary component of the Finch West LRT line that was subject to an EA conducted under the TPAP in 2010. The MSF was not evaluated under the 2010 TPAP and the EA for the Finch West MSF site is now underway. A summary of previous consultation and additional Project information can be found on Project website at www.metrolinx.com/finchwest.

Process
The environmental impacts of this transit Project will be assessed according to the TPA Process as prescribed in Ontario Regulation 231/08 under the Ontario *Environmental Assessment Act*. As part of the TPAP, an Environmental Project Report is being prepared. The Notice of Commencement for the TPAP for the Finch West MSF was issued in May 2015.

Consultation
Public consultation is a vital component to this Project. Building on the first Public Open House held in July 2014, the second Public Open House is being held to present the preferred conceptual design of the MSF, present the recommended mitigation measures and monitoring to minimize the environmental effects of the Project, and to outline commitments to future works. Representatives from the Project team will be available to answer questions and obtain your input. Please refer to the enclosed Notice for additional details.

The Public Open House will be held as follows:

Date: Wednesday, June 24, 2015
Time: 7:00 PM to 9:00 PM
Location: St. Wilfrid Catholic School Gym (1685 Finch Avenue West)

Please find the attached Notice of Commencement that was sent to you on May 14, 2015. To date, we do not have record of your response regarding potentially affected Aboriginal communities in the Project study area. Please indicate whether your agency is interested in participating by submitting a response through email by June 22, 2015.

We are interested in receiving any comments that your agency may have about this Project. Should you have any questions about this Project, or require additional information, please contact Renée Pettigrew, MCIP, RPP (Manager, Impact Assessment and Permitting) at renee.pettigrew@aecom.com. Comments may also be submitted on our Project website at www.metrolinx.com/finchwest or through our Project e-mail address at finchwest@metrolinx.com.

Thank you for your interest in this important transit investment in the City of Toronto.

Renée Pettigrew, MCIP, RPP
Manager, Impact Assessment and Permitting
Environment
renee.pettigrew@aecom.com

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Mississauga, ON L4W 4P2
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Template of Notice of Commencement letter sent to Aboriginal Communities

May 14, 2015

Regarding: **Notice of Commencement**
Environmental Assessment Study for Finch West LRT Light Rail Vehicle Maintenance and Storage Facility

The Project

Metrolinx has initiated an Environmental Assessment (EA) Study under the Transit Project Assessment Process (TPAP) for the construction and operation of a Maintenance and Storage Facility (MSF) for Finch West Light Rail Transit (LRT) System. The MSF is considered a necessary component of the Finch West LRT System that was subject to an EA conducted under the TPAP in 2010. The MSF was not evaluated under the 2010 TPAP and the EA for the Finch West MSF site is now underway.

Process

Metrolinx is the proponent for the proposed Finch MSF Project. The environmental impacts of this transit project will be assessed in accordance with Ontario Regulation 231/08 (Transit Projects Regulation) under the Ontario *Environmental Assessment Act*. The Transit Projects Regulation defines the TPAP that must be followed to complete the environmental assessment. During the TPAP, an Environmental Project Report (EPR) will be published and made available for review by the public and the Minister of the Environment.

Consultation

Building on the Public Open House (POH) in July 2014, Metrolinx will continue to engage and consult stakeholders throughout the TPAP period, including a second POH scheduled for June 2015 to present the Finch West MSF. Members of the public, government agencies, Aboriginal communities and other interested parties are encouraged to participate in the TPAP by attending information sessions or contacting Finch West MSF staff directly with information, comments or questions. Please refer to the enclosed Notice for additional details.

If you require additional information, please contact Renée Pettigrew, MCIP, RPP (Manager, Impact Assessment and Permitting) at renee.pettigrew@aecom.com. Comments may also be submitted on our Project website at www.metrolinx.com/finchwest or through our Project e-mail address at finchwest@metrolinx.com.

Thank you for your interest in this important transit investment in the City of Toronto.

Yours sincerely,

Les MacDermid, P. Eng.
Senior Project Manager – Systems and MSF
Sheppard and Finch West LRT

Metrolinx
Rapid Transit Implementation
5160 Yonge Street, Suite 300
Toronto, ON M2N 6L9

Enclosure

Blacha, Madelin

From: Pettigrew, Renee
Sent: Friday, May 15, 2015 9:42 AM
To: Amirsalari, Faranak; Blacha, Madelin
Subject: Fw: West Finch Maintenance and Storage Facility project
Attachments: HFN Response Letter - Metrolinx West Finch Maintenance and Storage Facility - May 14, 2015.doc

Follow Up Flag: Follow up
Flag Status: Flagged

From: Lori Loucks <lloucks@hiawathafn.ca>
Sent: Friday, May 15, 2015 9:39 AM
To: Pettigrew, Renee
Cc: les.macdermid@metrolinx.com
Subject: West Finch Maintenance and Storage Facility project

Dear Ms. Pettigrew,

Please find attached the response letter from Hiawatha First Nation regarding the above mentioned project. If you have any questions or comments regarding the letter please do not hesitate to contact me by one of the methods listed below.

Kind Regards,

Lori Loucks
Community Consultation Worker

Hiawatha First Nation
123 Paudash Street
Hiawatha, ON K9J 0E6
705-295-7771
705-295-7131 (fax)
lloucks@hiawathafn.ca

HIAWATHA FIRST NATION
123 Paudash Street
Hiawatha, ON K9J 0E6

Chief: **Greg Cowie**

Councillor: **Kirk Edwards**
Councillor: **Lorne Paudash**
Councillor: **Trisha Shearer**
Councillor: **Art Vowles**
Councillor: **Katie Wilson**

May 15, 2015

Dear Ms. Pettigrew;

Thank you for the information you sent to Hiawatha First Nation regarding the Metrolinx Finch West Maintenance and Storage Facility project which is being proposed within Hiawatha First Nation's Traditional and Treaty Territories. Hiawatha First Nation appreciates that Metrolinx and AECOM recognize the importance of First Nations Consultation and that your office is conforming to the requirements within the Duty to Consult Process. The correspondence Hiawatha First Nation has received is not considered meaningful consultation but rather information sharing.

As per the Hiawatha First Nation Consultation Protocol, your proposed project is deemed to have little, if any, impact on Hiawatha First Nation's traditional territory and/or rights. Please keep us apprised of any updates, archaeological findings, and/or of any environmental impacts, should they occur. Hiawatha First Nation requests you contact us if archaeological artifacts are found as we require our trained archaeological liaisons be present at the archaeological sites during the assessments. We also ask that you forward any archaeological reports to Hiawatha First Nation as they are completed. Any maps pertaining to the project should be sent to Hiawatha First Nation in a shape file.

Hiawatha First Nation reserves the right to provide additional comment should further development result in additional potential impact on our traditional territory and rights. Please be aware that while we request to be kept appraised throughout all phases of this project, we may not always have representation at all stakeholders meetings.

Further correspondence may be directed to my attention at the mailing address above or the e-mail address below.

In good faith and respect,

Lori Loucks
Core Consultation Worker
Hiawatha First Nation

llloucks@hiawathafn.ca
Tele: (705) 295-7771
Fax: (705) 295-7131

Cc Les MacDermid, Metrolinx

From: Pettigrew, Renee
Sent: Friday, July 03, 2015 4:00 PM
To: 'chiefcowie@hiawathafn.ca'
Cc: 'Les MacDermid'
Subject: Finch West Maintenance and Storage Facility Environmental Assessment

Our May 14, 2015 letter to you contained the Finch West LRT Maintenance and Storage Facility Notice of Commencement, as well as an invitation to attend the Public Open House (June 24, 2015) at which the proposed Project was presented. The environmental impacts of this transit project will be assessed according to the Transit Project Assessment Process (TPAP) as prescribed in Ontario Regulation 231/08 made under the Ontario *Environmental Assessment Act.*

To date we do not have a record of your response or interest in the Project. Your input and feedback are important to us we proceed with preparing the Environmental Project Report. Please indicate whether your community is interested in participating in the study by submitting a response through email to Renée Pettigrew and Les MacDermid by Tuesday, July 14, 2015.
We are happy to provide you with more information upon request. For more information, please visit www.metrolinx.com/finchwest.

Thank you in advance for your co-operation and partnership throughout this Project.

Sincerely,

Renée Pettigrew, MCIP, RPP
Manager, Impact Assessment and Permitting
Environment
renee.pettigrew@aecom.com

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www.aecom.com

Blacha, Madelin

From:	Pettigrew, Renee
Sent:	Friday, July 03, 2015 4:11 PM
To:	Amirsalari, Faranak; Blacha, Madelin; Tibor-McMahon, Marian
Subject:	FW: Finch West Maintenance and Storage Facility Environmental Assessment

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From: Aly Alibhai [mailto:AlyA@metisnation.org]
Sent: Friday, July 03, 2015 4:10 PM
To: Pettigrew, Renee
Cc: 'Les MacDermid'
Subject: RE: Finch West Maintenance and Storage Facility Environmental Assessment

Thank you for your message.

This will confirm that the Métis Nation of Ontario is not interested in participating in the study by submitting a response through email to Renée Pettigrew and Les MacDermid by Tuesday, July 14, 2015.

Kind regards,

-Aly

Aly N. Alibhai
Director of Lands, Resources & Consultations
Métis Nation of Ontario
311-75 Sherbourne Street
Toronto, ON M5A 2P9
T: 416-977-9881 ext.114
Toll Free: 1-888-466-6684
F: 416-977-9911
E: AlyA@metisnation.org
www.metisnation.org

From: Pettigrew, Renee [mailto:Renee.Pettigrew@aecom.com]
Sent: July-03-15 4:01 PM
To: Aly Alibhai

Cc: 'Les MacDermid'
Subject: Finch West Maintenance and Storage Facility Environmental Assessment

Our May 14, 2015 letter to you contained the Finch West LRT Maintenance and Storage Facility Notice of Commencement, as well as an invitation to attend the Public Open House (June 24, 2015) at which the proposed Project was presented. The environmental impacts of this transit project will be assessed according to the Transit Project Assessment Process (TPAP) as prescribed in Ontario Regulation 231/08 made under the Ontario *Environmental Assessment Act.*

To date we do not have a record of your response or interest in the Project. Your input and feedback are important to us we proceed with preparing the Environmental Project Report. Please indicate whether your community is interested in participating in the study by submitting a response through email to Renée Pettigrew and Les MacDermid by Tuesday, July 14, 2015.
We are happy to provide you with more information upon request. For more information, please visit www.metrolinx.com/finchwest.

Thank you in advance for your co-operation and partnership throughout this Project.

Sincerely,

Renée Pettigrew, MCIP, RPP
Manager, Impact Assessment and Permitting
Environment
renee.pettigrew@aecom.com

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Blacha, Madelin

From:	Pettigrew, Renee
Sent:	Monday, July 13, 2015 5:03 PM
To:	Amirsalari, Faranak; Blacha, Madelin
Subject:	Fw: Finch West Maintenance and Storage Facility Environmental Assessment
Follow Up Flag:	Follow up
Flag Status:	Flagged

From: Melanie Vincent <melanievincent21@yahoo.ca>
Sent: Monday, July 13, 2015 4:41 PM
To: Pettigrew, Renee
Reply To: Melanie Vincent
Cc: 'Les MacDermid'
Subject: Re: Finch West Maintenance and Storage Facility Environmental Assessment

Hello, the Huron-Wendat Nation would like to be informed of all project development aspects and we are requesting to receive the shapefiles of the project area to determine if we have archaeological sites and potential for sites in this area. Thank you!

Mélanie Vincent, M.Sc.AJS
Cell / SMS: (418) 580-4442
melanievincent21@yahoo.ca
Gestion MV Management
Gestion de projets / Project Management

From: "Pettigrew, Renee" <Renee.Pettigrew@aecom.com>
To: "melanievincent21@yahoo.ca" <melanievincent21@yahoo.ca>; "tina.durand@cnhw.qc.ca" <tina.durand@cnhw.qc.ca>
Cc: 'Les MacDermid' <Les.MacDermid@metrolinx.com>
Sent: Friday, July 3, 2015 3:59 PM
Subject: Finch West Maintenance and Storage Facility Environmental Assessment

Our May 14, 2015 letter to you contained the Finch West LRT Maintenance and Storage Facility Notice of Commencement, as well as an invitation to attend the Public Open House (June 24, 2015) at which the proposed Project was presented. The environmental impacts of this transit project will be assessed according to the Transit Project Assessment Process (TPAP) as prescribed in Ontario Regulation 231/08 made under the Ontario *Environmental Assessment Act.*

To date we do not have a record of your response or interest in the Project. Your input and feedback are important to us we proceed with preparing the Environmental Project Report. Please indicate whether your community is interested in participating in the study by submitting a response through email to Renée Pettigrew and Les MacDermid by **Tuesday, July 14, 2015**.
We are happy to provide you with more information upon request. For more information, please visit www.metrolinx.com/finchwest.

Thank you in advance for your co-operation and partnership throughout this Project.

Sincerely,

Renée Pettigrew, MCIP, RPP
Manager, Impact Assessment and Permitting
Environment
renee.pettigrew@aecom.com

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From: Melanie Vincent <melanievincent21@yahoo.ca>
Sent: Wednesday, July 15, 2015 1:25 PM
To: Jarrett, James
Cc: Les MacDermid; Morgan Rubes; Sampson.Ho@metrolinx.com; Tania Baynova; Praharsh.Dhyani@metrolinx.com; Amirsalari, Faranak; Brutto, David; Blacha, Madelin
Subject: Re: Finch West Maintenance and Storage Facility Environmental Assessment

This is satisfactory, thank you!

Mélanie Vincent, M.Sc.AJS
Cell / SMS: (418) 580-4442
melanievincent21@yahoo.ca
Gestion MV Management
Gestion de projets / Project Management

From: "Jarrett, James" <James.Jarrett@aecom.com>
To: "melanievincent21@yahoo.ca" <melanievincent21@yahoo.ca>
Cc: Les MacDermid <Les.MacDermid@metrolinx.com>; Morgan Rubes <Morgan.Rubes@metrolinx.com>; "Sampson.Ho@metrolinx.com" <Sampson.Ho@metrolinx.com>; Tania Baynova <Tania.Baynova@gotransit.com>; "Praharsh.Dhyani@metrolinx.com" <Praharsh.Dhyani@metrolinx.com>; "Amirsalari, Faranak" <Faranak.Amirsalari@aecom.com>; "Brutto, David" <David.Brutto@aecom.com>; "Blacha, Madelin" <Madelin.Blacha@aecom.com>
Sent: Tuesday, July 14, 2015 5:06 PM
Subject: Re: Finch West Maintenance and Storage Facility Environmental Assessment

Ms. Vincent,

Thank you for your interest in this project and request for information.

The proposed site for the Finch West Maintenance and Storage Facility (MSF) has previously been investigated for archaeological potential. In May 2008, Archaeological Services Inc. (ASI) completed a Stage 1 and 2 Archaeological Assessment (AA) for a proposed development on the same site. The initial Stage 1 AA determined that there was potential for the identification of precontact archaeological remains within the study area, and so a Stage 2 AA was undertaken. This subsequently determined that the study area could be considered free of any further archaeological concern. This recommendation was subsequently accepted by MTCS in January 2009 in their archaeological clearance letter.

The above information is documented in the attached “Appendix E” which will form an appendix to the final Environmental Assessment (EA) we are currently finalizing and will be filing for public review shortly. This EA is using the previously accepted Stage 1 and 2 AA as the basis for conducting the assessment of potential environmental effects for the proposed MSF.

Metrolinx is working to a tight deadline for the completion of this EA. We would appreciate your confirmation prior to **Friday July 17, 2015**, that our response and attached documentation satisfies your request.

Thank you again for your participation.

Sincerely,

James Jarrett, MSci., MCIP, RPP
Acting Manager & Senior Environmental Planner, Impact Assessment and Permitting
Environment
james.jarrett@aecom.com

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Appendix B

Natural Environment

- B1. SAR Habitat Assessment
- B2. Vascular Plant Inventory
- B3. Photographic Log of Finch West MSF Site

B1. SAR Habitat Assessment

Appendix B1: SAR Habitat Assessment

Species at Risk assessment and preferred habitat for Finch West MSF in the Toronto Region

Common Name	**Scientific Name**	**Preferred Habitat** (Significant Wildlife Habitat Technical Guide, Species at Risk Registry & Ontario's Biodiversity – ROM, COSEWIC Reports)	**Source of Information**	**Habitat Present within the Study Area** (Y/N)
Endangered				
Butternut	*Juglans cinerea*	Deciduous forests in rich, moist, and well-drained soils often found along streams; may also be found on well-drained gravel sites, especially in limestone areas. Grows alone or in small groups. Butternut is shade intolerant and usually occurs along or near edge of deciduous woodlots and hedgerows. Flowers in May; fruits mature late summer. Can be associated with the following ELC codes: **FOD2, FOD5, FOD6, FOD7; mature hedgerows; Soil: dry rocky or moist (4, 5, 6) to fresh (2, 3).**	- MNR – What's at Risk in My Area? Tool for Toronto Region , April 2014	**No -** Suitable habitat of deciduous forest is not present within the study area. Hedgerows are present; however, these are dominated by Bur Oak, American Elm and Hawthorns. Species was not observed during AECOM field investigations.
Redside Dace	*Clinostomus elongatus*	Species can be found in pools and slow-moving sections of relatively small (<10 m width), clear, cool, streams with sand or gravel bottoms and riffle/pool habitat. Their preferred water temperature range is 14-23°C.	- MNR – What's at Risk in My Area? Tool for Toronto Region , April 2014	**No -** No watercourses are present within the study area.
Rusty-patched Bumble Bee	*Bombus affinis*	The Rusty-patched Bumble Bee is a habitat generalist that within Ontario is found from the southern Great Lakes – St. Lawrence forest to the Carolinian Forest. This species is occurs in open habitat, such as mixed farmland, savannahs, sand dunes, urban and lightly wooded areas.[7] This species can be associated with the following ELC codes: **SDO, SDS, SDT, TPO, TPS, TPS and CUM**.	- MNR – What's at Risk in My Area? Tool for Toronto Region , April 2014	**No** – Suitable habitat is located within the study area; however the species is not likely to be present given the current distribution of this species. Historically the Rusty-patched Bumble Bee was common in eastern and North America, and up until 1970 was the fourth most common species of bumble bee in southern Ontario. The only occurrence of this species in Canada from 2002 to 2010 was at the Pinery Provincial Park. Species was not observed during AECOM field investigations.

Common Name	Scientific Name	Preferred Habitat (Significant Wildlife Habitat Technical Guide, Species at Risk Registry & Ontario's Biodiversity – ROM, COSEWIC Reports)	Source of Information	Habitat Present within the Study Area (Y/N)
Yellow-breasted Chat	*Icteria virens*	Species breeds in dense thickets around wood edges, riparian areas, and in overgrown clearings. The Ontario population is very dependent on successional habitats of thick shrubbery. These habitats are the result of vegetative growth in forest openings created by storms, fire, or abandoned fields. The availability of habitat in Ontario has been generally stable over the last decade. Can be associated with the following ELC codes: **CUT, CUW, FOD7**	• MNR – What's at Risk in My Area? Tool for Toronto Region , April 2014	**No -** Suitable habitat of dense thickets, riparian areas or overgrown clearings are not present within the study area. Species was not observed during AECOM field investigations.
Threatened				
Bank Swallow	*Riparia riparia*	Nest in natural and artificial vertical banks composed of sand-silt materials including riverbanks, bluffs, aggregate pits road cuts and soil stockpiles. Breeding sites typically located in close proximity to open terrestrial habitats use for aerial foraging, which can include grasslands, meadows, pastures and agricultural croplands (COSEWIC, 2013).	• Ontario Breeding Bird Atlas Search Square 17PJ14, May 2014	**No –** Suitable nesting habitat of vertical banks, bluffs, culverts or bridges are not present within the study area. Species was not observed during AECOM field investigations.
Barn Swallow	*Hirundo rustica*	Nearly all nests are made on man-made structures such as barns, garages, sheds, boat houses, bridges, road culverts, eaves and wharfs. Farmlands or rural areas; forages over open country especially near bodies of water. Can be associated with the following ELC codes: Forages in **TPO, CUM1, MAM, MAS, OAO, SAS1, SAM1, SAF1;** nest on suitable structures.	• MNR – What's at Risk in My Area? Tool for Toronto Region , April 2014 • Ontario Breeding Bird Atlas Search Square 17PJ14, May 2014	**No –** Suitable nesting habitat of barns, bridges and other structures are not present within the study area. Species was not observed during AECOM field investigations.
Blanding's Turtle	*Emydoidea blandingii*	Freshwater lakes, permanent or temporary pools, slow-flowing streams, marshes, swamps; prefers shallow water, organic soil & dense vegetation; nest in loose substrates, including sand, organic soil, gravel, cobblestone; overwinter in permanent pools that	• MNR – What's at Risk in My Area? Tool for Toronto Region , April 2014	**No -** Suitable habitat of lakes, marshes, or swamps are not present within the study area.

Common Name	Scientific Name	**Preferred Habitat** (Significant Wildlife Habitat Technical Guide, Species at Risk Registry & Ontario's Biodiversity – ROM, COSEWIC Reports)	**Source of Information**	**Habitat Present within the Study Area** (Y/N)
		average about 1 m in depth, or in slow-flowing streams or in bogs; basks on logs, stumps, or banks. Can be associated with the following ELC codes: **SWT2, SWT3, SWD, SWM, MAS2, SAS1, SAM1,** where open water present.		Species was not observed during AECOM field investigations.
Bobolink	*Dolichonyx oryzivorus*	Nests primarily in forage crops, particularly **hayfields and pastures**, dominated by a variety of species such as clover, tall grasses and broadleaved plants; also occurs in wet prairie, graminoid, peatlands and abandoned fields; **generally requires tracts of grassland >5 ha**. Also nests in lightly grazed pastures, fallow and abandoned fields and shallow grassy marshes. Can be associated with the following ELC Codes: **TPO, TPS, CUM1, MAM2**	• MNR – What's at Risk in My Area? Tool for Toronto Region , April 2014 • Ontario Breeding Bird Atlas Search Square 17PJ14, May 2014	**Yes -** Suitable habitat of cultural meadow is present on site; however, the habitat is considered marginal for Bobolink because the habitat is of small in size and highly disturbed. The study area is within a densely populated urbanized environment and considerable evidence of anthropogenic disturbance including traffic noise, litter and pedestrian foot traffic were noted during field investigations. Species was not observed during AECOM field investigations.
Chimney Swift	*Chaetura pelagica*	Formerly nested in the trunks of large, hollow trees. Today, mainly use chimneys or abandoned buildings as nesting sites. May forage over wide variety of habitats. It **requires dead trees >30 cm** for roosting and possibly nesting. Where swifts observed foraging only, is not Significant habitat. Can be associated with the following ELC codes: Forages in TPO**, CUM1, MAM, MAS, OAO, SAS1, SAM1, SAF1**; nest in any communities where buildings with chimneys present.	• Ontario Breeding Bird Atlas Search Square 17PJ14, May 2014	**No –** Suitable nesting structures with vertical surfaces are not present within the study area. Species was not observed during AECOM field investigations.

Common Name	Scientific Name	Preferred Habitat (Significant Wildlife Habitat Technical Guide, Species at Risk Registry & Ontario's Biodiversity – ROM, COSEWIC Reports)	Source of Information	Habitat Present within the Study Area (Y/N)
Eastern Meadowlark	*Sturnella magna*	Most common in native grasslands, savannah, old fields, hayfields, lightly grazed pastures, weedy meadows, fields with occasional shrubs. **Minimum area of grassland required is about 5 ha**. Can be associated with the following ELC codes: **TPO, TPS, CUM1, MAM2, MAS2**	• MNR – What's at Risk in My Area? Tool for Toronto Region , April 2014 • Ontario Breeding Bird Atlas Search Square 17PJ14, May 2014	**Yes -** Suitable habitat of cultural meadow is present on site; however, the habitat is considered marginal for Eastern Meadowlark because the habitat is of small in size and highly disturbed. The study area is within a densely populated urbanized environment and considerable evidence of anthropogenic disturbance including traffic noise, litter and pedestrian foot traffic were noted during field investigations. **A pair of Eastern Meadowlark was confirmed on site exhibiting nesting behaviour within the subject property.**
Least Bittern	*Ixobrychus exilis*	Occurs in large marshes (especially cattail) with good interspersion of emergents and open water. Nests sit on platforms of stiff stems; nests within 10m of open water. Prefers large marshes that have relatively stable water levels throughout the nesting period. Can be associated with the following ELC codes: **MAS2-1, MAS3-1, SA, OAO**	• MNR – What's at Risk in My Area? Tool for Toronto Region , April 2014	**No -** Suitable habitat of large open marsh is not present within the study area. Species was not observed during AECOM field investigations.
Spiny Softshell	*Apalone spinifera*	Species is intolerant of pollution, and inhabits large river systems, shallow lakes and ponds with muddy bottoms and aquatic vegetation. Can be found basking on sandbars, mud flats, grassy beaches, logs or rocks. Their eggs are laid near water on sandy beaches or gravel banks in areas with sun, and requires acceptable feeding, nesting, habitat and natural, undisturbed corridors between these critical habitats.	• MNR – What's at Risk in My Area? Tool for Toronto Region , April 2014	**No -** Suitable habitat of lakes, rivers or ponds are not present within the study area. Species was not observed during AECOM field investigations.
Special Concern				

Common Name	**Scientific Name**	**Preferred Habitat** (Significant Wildlife Habitat Technical Guide, Species at Risk Registry & Ontario's Biodiversity – ROM, COSEWIC Reports)	**Source of Information**	**Habitat Present within the Study Area** (Y/N)
Black Tern	*Chlidonias niger*	They build floating nests in loose colonies in shallow marshes, especially in cattails. In winter they migrate to the coast of northern South America.	- MNR – What's at Risk in My Area? Tool for Toronto Region , April 2014	**No -** Suitable habitat of shallow marsh is not present within the study area. Species was not observed during AECOM field investigations.
Broad Beech Fern	*Phegopteris hexagonoptera*	Species inhabits rich, moist soil in mature deciduous forests. Can be associated with the following ELC codes: **FOD6, FOD7, FOD8, FOD9.**	- MNR – What's at Risk in My Area? Tool for Toronto Region , April 2014	**No -** Suitable habitat of mature deciduous forest is not present within the study area. Species was not observed during AECOM field investigations.
Eastern Ribbonsnake	*Thamnophis sauritus*	It is most frequently found along the edges of shallow ponds, streams, marshes, swamps, or bogs bordered by dense vegetation that provides cover. Abundant exposure to sunlight is also required, and adjacent upland areas may be used for nesting. Can be associated with the following ELC codes: **OAO, MAM, MAS, SWD, BOS.**	- MNR – What's at Risk in My Area? Tool for Toronto Region , April 2014	**No –** Suitable wetland habitat is not present within the study area. Species was not observed during AECOM field investigations.
Eastern Musk Turtle	*Sternotherus odoratus*	Can be found in aquatic environments, except when laying eggs. As well as shallow slow moving water of lakes, streams, marshes and ponds. Can be found hibernating in underwater mud, in banks or in muskrat lodges. Its eggs are laid in debris or under stumps or fallen logs at water's edge, and often share nest sites. They have been known to congregate at hibernation sites, and are not readily observed.	- MNR – What's at Risk in My Area? Tool for Toronto Region , April 2014	**No -** Suitable aquatic habitat of shallow slow moving waterbodies, marshes, or ponds are not present within the study area. Species was not observed during AECOM field investigations.
Eastern Wood-Pewee	*Contopus virens*	Eastern Wood-pee nests in the mid-canopy of forest cleanings or the edges of deciduous and mixed forests. This species is often associated with forests dominated by Sugar Maple (*Acer Saccharum*), Elm (*Ulmus Sp.*) and Oak (*Quercus Sp.*)	- Ontario Breeding Bird Atlas Search Square 17PJ14, May 2014	**No -** Suitable habitat of deciduous or mixed forest is not present within the study area. Hedgerows are present; however, these are of insufficient size to support this woodland bird species.

Common Name	Scientific Name	**Preferred Habitat** (Significant Wildlife Habitat Technical Guide, Species at Risk Registry & Ontario's Biodiversity – ROM, COSEWIC Reports)	**Source of Information**	**Habitat Present within the Study Area** (Y/N)
				Species was not observed during AECOM field investigations.
Lake Sturgeon	Acipenser fulvescens	The Lake Sturgeon lives almost exclusively in freshwater lakes and rivers with soft bottoms of mud, sand or gravel. They are usually found at depths of five to 20 metres. They spawn in relatively shallow, fast-flowing water (usually below waterfalls, rapids, or dams) with gravel and boulders at the bottom. However, they will spawn in deeper water where habitat is available. They also are known to spawn on open shoals in large rivers with strong currents.	• MNR – What's at Risk in My Area? Tool for Toronto Region , April 2014	**No -** No watercourses or waterbodies are present within the study area.
Milksnake	*Lampropeltis triangulum*	Species can be found in farmlands, meadows, hardwood or aspen stands. As well as pine forest with brushy or woody cover; river bottoms or bog woods. Occasionally hides under logs, stones, or boards or in outbuildings, and often uses communal nest sites. Can be associated with the following ELC codes: **CUM, FOD, FOC**	• MNR – What's at Risk in My Area? Tool for Toronto Region , April 2014	**No–** although a cultural meadow is located within the study area, the species is not likely to be present because the study area offers little cover and nesting habitat. The study area also does not include suitable hibernacula with rock piles extending below the frost line. Furthermore the study area is highly disturbed, located within densely populated urbanized environment and is bounded by busy roads on three sides. Species was not observed during AECOM field investigations.
Northern Map Turtle	*Graptemys geographica*	Species inhabits large bodies of water with soft bottoms, and aquatic vegetation. Can be found basking on logs or rocks as well as beaches and grassy edges. Usually uses soft soil or clean dry sand for nest sites, and may nest at some distance from water. Its home range size is larger for females (about 70 ha) than males (about 30 ha) and includes hibernation, basking, nesting and feeding areas. Their aquatic corridors (e.g. stream) are required for	• MNR – What's at Risk in My Area? Tool for Toronto Region , April 2014	**No -** Suitable habitat of large waterbodies with soft bottoms and aquatic vegetation is not present within the study area. Species was not observed during AECOM field investigations.

Common Name	Scientific Name	**Preferred Habitat** (Significant Wildlife Habitat Technical Guide, Species at Risk Registry & Ontario's Biodiversity – ROM, COSEWIC Reports)	**Source of Information**	**Habitat Present within the Study Area** (Y/N)
		movement. Species is not readily observed. Can be associated with the following ELC codes: **OAO, SA**		
Peregrine Falcon	*Falco peregrinus*	Species can be found in various types of habitats, from Arctic tundra to coastal areas and from prairies to urban centres. They usually nest alone on cliff ledges or crevices, preferably 50 to 200 m in height, however can be found on the ledges of tall buildings or bridges, always near good foraging areas. Suitable nesting sites are usually dispersed, but can be common locally in some areas.	• MNR – What's at Risk in My Area? Tool for Toronto Region , April 2014	**No -** Suitable nesting habitat of cliff or building ledges are not present within the study area. Species was not observed during AECOM field investigations.
Snapping Turtle	Chelydra serpentina	Although Snapping Turtles have been observed in shallow water in almost every kind of freshwater habitat, the preferred habitat of the species is characterized by slow-moving water with a soft mud bottom and dense aquatic vegetation. Established populations are most often located in ponds, sloughs, shallow bays or river edges, and slow streams, or areas combining several of these wetland habitats. Individual turtles will persist in urbanized water bodies, such as golf course ponds and irrigation canals, but it is unlikely that a population could become established in such habitats.	• MNR – What's at Risk in My Area? Tool for Toronto Region , April 2014	**No –** Suitable aquatic and wetland habitat are not present within the study area. Species was not observed during AECOM field investigations.
Wood Thrush	*Hylocichala mustelina*	This species nests in mature or secondary growth deciduous and mixed forests with dense understory layer. The species preferentially nests in large forest mosaics but can also use fragmented forests as well.	• Ontario Breeding Bird Atlas Search Square 17PJ14, May 2014	**No -** Suitable habitat of deciduous or mixed forest is not present within the study area. Hedgerows are present; however, these are of insufficient size to support this woodland bird species. Species was not observed during AECOM field investigations.

B2. Vascular Plant Inventory

Appendix B2: Vascular Plant Inventory

BOTANICAL NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS TORO
			OLDHAM ET AL	OLDHAM ET AL	OLDHAM ET AL	NEWMASTER			NEWMASTER	VARGA 2000
Aceraceae		**Maple Family**								
Acer	*negundo*	Manitoba Maple	0	-2		S5	-	-	G5	X
Anacardiaceae		**Sumac or Cashew Family**								
Rhus	*hirta*	Staghorn Sumac	1	5		S5	-	-	G5	X
Apiaceae		**Carrot or Parsley Family**								
Daucus	*carota*	Wild Carrot		5	-2	SE5	-	-	G?	X
Asclepiadaceae		**Milkweed Family**								
Asclepias	*syriaca*	Common Milkweed	0	5		S5	-	-	G5	X
Cynanchum	*rossicum*	Dog-strangling Vine				SE5	-	-	G?	X
Asteraceae		**Composite or Aster Family**								
Symphyotrichum	*lanceolatum*	Tall White Aster	3	-3		S5	-	-	G5T?	X
Symphyotrichum	*novae-angliae*	New England Aster	2	-3		S5	-	-	G5	X
Cirsium	*arvense*	Canada Thistle		3	-1	SE5	-	-	G?	X
Cirsium	*vulgare*	Bull Thistle		4	-1	SE5	-	-	G5	X
Inula	*helenium*	Elecampane		5	-2	SE5	-	-	G?	X
Solidago	*altissima*	Tall Goldenrod	1	3		S5	-	-		X
Taraxacum	*officinale*	Common Dandelion		3	-2	SE5	-	-	G5	X
Tragopogon	*pratensis ssp. pratensis*	Common Goats's-beard		5	-1	SE5	-	-	G?T?	X
Brassicaceae		**Mustard Family**								
Barbarea	*vulgaris*	Yellow Rocket		0	-1	SE5	-	-	G?	X
Hesperis	*matronalis*	Dame's Rocket		5	-3	SE5	-	-	G4G5	X
Caprifoliaceae		**Honeysuckle Family**								
Lonicera	*tatarica*	Tartarian Honeysuckle		3	-3	SE5	-	-	G?	X
Convolvulaceae		**Morning-glory Family**								
Convolvulus	*arvensis*	Field Bindweed		5	-1	SE5	-	-	G?	X
Cornaceae		**Dogwood Family**								
Cornus	*amomum*	Silky Dogwood	5	-4		S5	-	-	G5T?	R2
Fabaceae		**Pea Family**								
Lotus	*corniculatus*	Bird's-foot Trefoil		1	-2	SE5	-	-	G?	X
Melilotus	*alba*	White Sweet-clover		3	-3	SE5	-	-	G?	X
Trifolium	*pratense*	Red Clover		2	-2	SE5	-	-	G?	X
Trifolium	*repens*	White Clover		2	-1	SE5	-	-	G?	X
Vicia	*cracca*	CowVetch		5	-1	SE5	-	-	G?	X
Fagaceae		**Beech Family**								
Quercus	*macrocarpa*	Bur Oak	5	1		S5	-	-	G5	X
Onagraceae		**Evening-primrose Family**								
Epilobium	*ciliatum ssp. glandulosum*	Northern Willow-herb	6	3		SU	-	-	G5T?	
Polygonaceae		**Smartweed Family**								
Rumex	*crispus*	Curly-leaf Dock		-1	-2	SE5	-	-	G?	X
Rosaceae		**Rose Family**								
Crataegus	*macrosperma*	Variable Thorn	4	5		S5	-	-	G5	R1
Crataegus	*punctata*	Large-fruited Thorn	4	5		S5	-	-	G5	X
Fragaria	*virginiana*	Virginia Strawberry	2	1		SU	-	-	G5T?	X
Geum	*canadense*	White Avens	3	0		S5	-	-	G5	X
Malus	*pumila*	Common Crabapple		5	-1	SE5	-	-	G5	X
Prunus	*virginiana*	Choke Cherry	2	1		S5	-	-	G5T?	X
Pyrus	*communis*	Common Pear		5	-1	SE4	-	-	G5	X
Linaria	*vulgaris*	Butter-and-eggs		5	-1	SE5	-	-	G?	X
Rosa	*species*	Rose species								
Tiliaceae		**Linden Family**								
Tilia	*americana*	American Basswood	4	3		S5	-	-	G5	X
Ulmaceae		**Elm Family**								
Ulmus	*americana*	White Elm	3	-2		S5	-	-	G5?	X
Vitaceae		**Grape Family**								
Vitis	*riparia*	Riverbank Grape	0	-2		S5	-	-	G5	X
Cyperaceae		**Sedge Family**								
Eleocharis	*erythropoda*	Red-footed Spike-rush	4	-5		S5	-	-	G5	X
Poaceae		**Grass Family**								
Bromus	*arvensis*	Field Brome				SE1	-	-	G?	
Dactylis	*glomerata*	Orchard Grass		3	-1	SE5	-	-	G?	X
Festuca	*species*	Fescue species					-	-		
Phalaris	*arundinacea*	Reed Canary Grass	0	-4		S5	-	-	G5	X
Phleum	*pratense*	Timothy		3	-1	SE5	-	-	G?	X

Appendix B2: Vascular Plant Inventory

BOTANICAL NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS TORO
			OLDHAM ET AL	OLDHAM ET AL	OLDHAM ET AL	NEWMASTER			NEWMASTER	VARGA 2000
Poa	*compressa*	Canada Blue Grass	0	2		S5	-	-	G?	X
Poa	*palustris*	Fowl Meadow Grass	5	-4		S5	-	-	G5	U
Typhaceae		**Cattail Family**								
Typha X	*glauca*	Glaucous Cattail	3	-5		S5	-	-	HYB	X

Appendix B2: Vascular Plant Inventory

BOTANICAL NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	GLOBAL STATUS	LOCAL STATUS TORO
			OLDHAM ET AL	OLDHAM ET AL	OLDHAM ET AL	NEWMASTER			NEWMASTER	VARGA 2000
FLORISTIC SUMMARY & ASSESSMENT										
Species Diversity										
Total Species:		**43**								
Native Species:		**22**	51.16%							
Exotic Species		**21**	48.84%							
Total Taxa in Region (List Region, Source)		10000								
% Regional Taxa Recorded		0.43%								
Regionally Significant Species		3								
S1-S3 Species		0								
S4 Species		0								
S5 Species		20								
Co-efficient of Conservatism										
Co-efficient of Conservatism (CC) (average)		**2.59**								
CC 0 to 3	*lowest sensitivity*	14	63.64%							
CC 4 to 6	*moderate sensitivity*	8	36.36%							
CC 7 to 8	*high sensitivity*	0	0.00%							
CC 9 to 10	*highest sensitivity*	0	0.00%							

EXPLANATION OF TERMINOLOGY *(See the following pages for addition detailed information on terms.)*

Co-efficient of Conservatism: This value, ranging from 0 (low) to 10 (high), is based on a species tolerance of disturbance and fidelity to a

Wetness Index: This value, ranging from -5 (obligate wetland) to 5 (upland) provides the probability of a species occurring in wetland or

Weediness Index: This value, ranging from -1 (low) to -3 (high) quantifies the potential invasiveness of non-native plants. In combination with the percentage of non-native plants, it can be used as an indicator of disturbance.

Provincial Status: Provincial ranks are used by the NHIC to set protection priorities for rare species and natural communities. These ranks are not legal designations. S4 and S5 species are generally uncommon to common in the province. Species ranked S1-S3 are considered

Local Status:

X: native species present (collection-based) and all exotic species

R: native species locally rare (number of stations): Durham (<10 stations), GTA (<40 stations), Site District 6E7 (<20 stations)

U: native species locally uncommon Durham (11-20 stations), GTA (41-80 stations), Site District 6E7 (21-40 stations)

Note: study area in Site District 6E13

DETAILED EXPLANATION OF TERMS

Floral Quality Index and Coefficient of Conservatism Values

Vegetation species and community sensitivity was assessed through the application of coefficient of conservatism values (CC), assigned to each native species in southern Ontario (Oldham, et. al, 1995). The value of CC, ranging from 0 (low) to 10 (high), is based on a species tolerance of disturbance and fidelity to specific habitat integrity. The occurrence of species with a CC of 9 or 10 can be good indicators of

General habitat values associated with the CC values are:

0-3: species found in a wide variety of communities, including disturbed sites
4-6: species associated with a specific community, but tolerate moderate disturbance
7-8: species associated with a community in an advanced successional stage, tolerant of minor disturbances
9-10: species with a high degree of fidelity to a narrow range of synecological parameters

Weediness Index

The sensitivity of natural areas can be assessed through application of the Weediness Index. The Weediness Index quantifies the potential invasiveness of non-native plants, and, in combination with the percentage of non-native plants can be used as an indicator of disturbance. Values (ranging from 1- to -3) have been assigned to most non-native species based on the potential impact each species can have in

-1: little or no impact on natural areas (most non-native plants are in this category)
-2: occasional impacts on natural areas, generally infrequent or localized
-3: major potential impacts on natural areas

Wetness Index

All plants in southern Ontario have been assigned a wetland category, based on the designations developed for use by the United States Fish & Wildlife Service. Plants are designated into the following categories:

OBL (Obligate Wetland): occurs almost always in wetlands under natural conditions (estimated >99% probability)

FACW (Facultative Wetland): usually occurs in wetlands, but occasionally found in non-wetlands (estimated 67-99% probability)

FAC (Facultative): equally likely to occur in wetlands or non-wetlands (estimated 34-66% probability)

FACU (Facultative Upland): occasionally occurs in wetlands, but usually occurs in non-wetlands (estimated 1-33% probability)

UPL (Upland): occurs almost never in wetlands under natural conditions (estimated <1% probability)

Further refinement of the Facultative categories are denoted by a “+” or “-” to express exaggerated tendencies for those species. The “+” denotes a greater estimated probability occurring in wetlands than species in the general indicator category, but a lesser probability than species occurring in the next higher category. The "-" denotes a lesser estimated probability of occurring in wetlands than species in the general indicator category, but a greater probability than species occurring in the next lower general category.

Each wetland category has been assigned a numerical value to facilitate the quantification of the wetness index. The wetland categories and their corresponding values are as follows:

OBL : -5
FACW+: -4
FACW: -3
FACW-: -2
FAC+: -1
FAC: 0
FAC-: 1
FACU+: 2
FACU: 3
FACU-: 4
UPL: 5

Provincial Status

Provincial ranks are used by the NHIC to set protection priorities for rare species and natural communities. These rankings are based on the total number of extant Ontario populations and the degree to which they are potentially or actively threatened with destruction. The ranks

S1: Critically Imperiled—Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province

S2: Imperiled—Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province

S3: Vulnerable—Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation

S4: Apparently Secure—Uncommon but not rare; some cause for long-term concern due to declines or other factors.

S5:Secure—Common, widespread, and abundant in the nation or state/province

SH: Possibly Extirpated (Historical)—Species or community occurred historically in the nation or state/province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could become NH or SH without such a 20-40 year delay if the only known occurrences in a nation or state/province were destroyed or if it had been extensively and unsuccessfully looked for. The NH or SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from

SNR Unranked—Nation or state/province conservation status not yet assessed

SX: Presumed Extirpated—Species or community is believed to be extirpated from the nation or state/province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered

SNA Not Applicable —A conservation status rank is not applicable because the species is not a suitable target for conservation

SU: Unrankable—Currently unrankable due to lack of information or due to substantially conflicting information about status or

Rank ranges, e.g. S2S3, indicate that the rank is either S2 or S3, but that current information is insufficient to differentiate.

S#S# Range Rank —A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

REFERENCES

Nomenclature based on:

Newmaster, S.G., A. Lehela, P.W.C Uhlig, S. McMurray and M.J. Oldham. 1998. Ontario plant list. Ontario Ministry of Natural Resources, Ontario Forest Research Institute, Sault Ste. Marie, ON, Forest Research Information Paper No. 123. 550 pp. + appendices.

Co-efficient of Conservatism, Wetness & Weediness

Oldham, M.J., W.D. Bakowsky and D.A. Sutherland. 1995. Floristic quality assessment for southern Ontario. OMNR, Natural Heritage Information Centre, Peterborough. 68 pp.

Provincial (Ontario) Status:

Natural Heritage Information Centre (NHIC). 2000. Provincial status of plants, wildlife and vegetation communities database. http://www.mnr.gov.on.ca/MNR/nhic/nhic.html. OMNR, Peterborough.

Local Status:

Varga, S., editor. August 2000. Distribution and status of the vascular plants of the Greater Toronto Area. Ontario Ministry of Natural Resources, Aurora District. 103 pp.

B3. Photographic Log of Finch West MSF Site

Appendix B3: Photographic Log of Finch MSF Site

	
Photograph 1 ↑ Cultural meadow looking northwest from southeast corner of study area. Photograph taken April 23, 2014.	**Photograph 2 ↑** Cultural meadow looking east from southwest corner of study area. Photograph taken April 23, 2014.
	
Photograph 3 ↑ Cultural meadow looking north from southeast corner of study area. Photograph taken April 23, 2014.	**Photograph 4 ↑** Cultural meadow looking north from Finch Ave. Water pooling in depressions of undulating terrain. Photograph taken April 23, 2014

Photograph 5 ↑
Cultural meadow looking south from northeast corner of study area. Photograph taken April 23, 2014

Photograph 6 ↑
Large hedgerow located in northwest portion of the study area. North facing vantage point, photo taken April 23, 2014.

Photograph 7 ↑
Smaller hedgerow located in the northwest corner of study area. Northwest facing vantage point, photo taken April 23, 2014.

Photograph 8 ↑
Water pooling in study area. Photograph taken April 23, 2014.

Photograph 9 ↑
Rubble present in southeast portion of the study area.
Photograph taken April 23, 2014.

Photograph 10 ↑
Single catch basin located in northeast corner of the study area. Photograph taken April 23, 2014.

Photograph 11 ↑
400 milimetres (mm) corrugated steel pipe culvert located in the southwest corner of the study area.
Photograph taken April 23, 2014.

Photograph 12 ↑
Groundwater monitoring well located within project study area along Norfinch Drive.
Photograph taken April 23, 2014.

Appendix C

Noise and Vibration Report

Metrolinx

Finch West LRT Maintenance and Storage Facility – Environmental Assessment – Noise and Vibration Report

Prepared by:

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Project Number:

60318592

Date:

July, 2015

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The attached Report (the "Report") has been prepared by AECOM Canada Ltd. ("Consultant") for the benefit of the client ("Client") in accordance with the agreement between Consultant and Client, including the scope of work detailed therein (the "Agreement").

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- must be read as a whole and sections thereof should not be read out of such context;
- was prepared for the specific purposes described in the Report and the Agreement; and
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Revision Log

Revision #	Revised By	Date	Issue / Revision Description
0	James Au	July 2015	Original Document

AECOM Signatures

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Executive Summary

As part of the Finch West Light Rail Transit (LRT) line, a maintenance and storage facility (the Facility) will be required for the servicing and storage of the LRT vehicles. An environmental assessment is required to be completed for the Facility. As part of the environmental assessment, this report documents the impact on the noise and vibration sensitive receptors surrounding the Facility. Further background regarding the project history and environmental assessment process is presented in the Environmental Project Report[1].

The Facility is proposed to be located on the north side of Finch Avenue West between York Gate Boulevard and Norfinch Drive. Noise and vibration sensitive receptors surrounding the proposed Facility were identified using aerial photography and zoning maps.

Construction noise and vibration has been reviewed as part of this assessment. The review has indicated that adverse impacts on the surrounding sensitive receivers are likely during some construction activities. Guidance to minimize the construction noise and vibration impacts is provided in Sections 4.1.2 and 4.2.2. Development of construction noise and vibration mitigation plans is required during detail design. Requirements of the mitigation plans are detailed in Sections 4.1.3 and 4.2.3.

The operational noise and vibration was also assessed. Four Alternative Designs have been reviewed to produce input for the development of the Preferred Design. Analysis indicates that noise and vibration mitigation measures will be required for the Facility to operate within compliance with the applicable vibration and Ministry of the Environment and Climate Change (MOECC) guidelines. Noise and vibration mitigation measures to be refined during detail design are described in Sections 6.1.2 and 6.2.2. Plans detailing the operational noise and vibration mitigation measures being implemented at the Facility are required during detail design.

A program of noise and vibration monitoring is recommended to confirm that construction noise and vibration impacts meet acceptable level limits. Pre-construction noise measurements are also recommended to refine noise level limits used in the assessment of operational noise. Vibration measurements are also recommended to confirm the performance of the operational vibration mitigation measures once the Facility is operational. Force mobility measurements can be conducted to refine the vibration transmission capability characteristic of the ground between the site and the vibration sensitive locations during detail design. This may reduce the required vibration mitigation performance.

With appropriate noise and vibration mitigation plans implemented, the noise and vibration impacts will be minimized during construction, and meet applicable guideline limits during operation.

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[1] *Finch West Light Rail Maintenance and Storage Facility Environmental Project Report, AECOM 2014*

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Appendices

1. Introduction

As part of the Finch West Light Rail Transit (LRT) line, a maintenance and storage facility (the Facility) will be required for the servicing and storage of the LRT vehicles. An environmental assessment is required for the Facility. As part of the environmental assessment, this report documents the impact on the noise and vibration sensitive receptors surrounding the Facility. Further background regarding the project history and environmental assessment process is presented in the Environmental Project Report[2].

The Facility is proposed to be located on the north side of Finch Avenue West between York Gate Boulevard and Norfinch Drive. Noise and vibration sensitive receptors surrounding the proposed Facility were identified using aerial photography and zoning maps. The identification of the noise and vibration sensitive receptors was based upon the definition provided in Ministry of the Environment and Climate Change (MOECC) publication NPC-300 which includes land uses such as:

- Residential dwellings
- Commercial noise sensitive spaces (hotels, motels)
- Institutional noise sensitive buildings (nursing homes, schools, some medical facilities)

Receptors can be grouped into areas where similar noise and vibration levels can be expected. These noise and vibration sensitive areas are presented on Figure 1 and further discussed in the following sections. Areas further removed from the Facility will receive lower noise and vibration impacts.

2. Baseline Measurements

Background noise and vibration measurements were completed to characterize the existing conditions of the noise and vibration areas surrounding the proposed Facility. As mentioned above, individual noise and vibration receptors can be grouped into areas where similar noise and vibration levels are expected. For the purposes of the background measurements, the noise sensitive receptors were grouped into areas along:

- Finch Avenue West
- Norfinch Avenue
- Jane Street and York Gate Boulevard
- Wheatsheaf Crescent

‘Vacant’ land to the north of the proposed Facility is zoned for utility (Hydro transmission corridor) and Open Space (recreational type) and will not be redeveloped into noise sensitive land uses.

Noise and vibration monitoring locations are presented on Figure 2. Table 1 presents the correlation between noise sensitive areas and monitoring locations below. To avoid short term, high impact noise from the police station on Norfinch Avenue as per NPC-300 guidelines, the noise sensitive area along Norfinch was represented by monitors Loc1 and Loc2.

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[2] *Finch West Light Rail Maintenance and Storage Facility Environmental Project Report, AECOM 2014*

Table 1: Monitored Noise and Vibration Sensitive Areas

Sensitive Area	Location Description	Representative Monitoring Location
Norfinch Drive	Nursing home, hotels, school	Loc1, Loc2
Finch Avenue West	Nursing home and residences	Loc1
Wheatsheaf Crescent	Residences	Loc2, Loc3
Jane St. and York Gate Blvd.	Residences	Loc4

Ambient noise monitoring was conducted between May 16th, 2014 and May 21st, 2014 at locations representative of noise sensitive areas. Monitoring of the identified noise sensitive areas was conducted using Quest SoundPro DL-1 sound level meters. Noise monitors were mounted to an existing structure (telephone/lamp poles) approximately three metres above ground level. Measurements were completed in 1 hour L_{EQ}[3] increments. Data collected during periods of inclement weather (wind speeds above 20km/h, any precipitation) were excluded from analysis. A summary of the noise monitoring is presented in Table 2 with detailed noise measurement data provided in Appendix A.

Table 2: Baseline Noise Monitoring Results

Monitoring Location	Time Period[4]	Minimum (1 hour L_{EQ} dBA)	Maximum (1 hour L_{EQ} dBA)	Average (1 hour L_{EQ} dBA)
Loc1 – Between Pelican Gate and Elana Drive on Finch Ave. West	Daytime	67	73	69
	Evening	68	71	69
	Night time	63	70	66
Loc2 – West side of Wheatsheaf Crescent	Daytime	48	72	57
	Evening	51	65	59
	Night time	42	61	54
Loc3 – East side of Wheatsheaf Crescent	Daytime	50	66	56
	Evening	50	60	56
	Night time	42	61	54
Loc4 – On York Gate Blvd., between Hullmar Drive and Jane St.	Daytime	57	67	62
	Evening	61	75	66
	Night time	53	66	58

The results in the above table indicate that the average noise levels during the day and evening are elevated over the night time levels. This is expected in urbanized areas where traffic noise is the predominant source of background noise levels.

The assessment of transportation corridors (vehicles within the right of way) is assessed based upon the daytime equivalent (L_{EQ16hr}) and night time equivalent (L_{EQ8hr}) noise levels, this is further discussed in Section 3. As such, the existing daytime and night time equivalent sound levels, calculated from the background measurements, are presented in Table 3.

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[3] *L_{EQ} is the acoustical energy average over a period of time, in the case of this project, 1 hour duration which is the typical metric for the assessment of noise from stationary noise sources.*

[4] *Daytime is defined as the hours between 07:00 to 19:00 hours, evening is defined as the hours between 19:00 to 23:00 hours, night time is defined as the hours between 23:00 to 07:00 hours.*

Table 3: Baseline Day and Night Equivalent Sound Levels

Monitoring Location	Day time L_{EQ16hr} [dBA]	Night time L_{EQ8hr} [dBA]
Loc1 – Between Pelican Gate and Elana Drive on Finch Ave. West	69.4	66.6
Loc2 – West side of Wheatsheaf Crescent	60.7	55.6
Loc3 – East side of Wheatsheaf Crescent	57.4	55.6
Loc4 – On York Gate Blvd., between Hullmar Drive and Jane St.	64.7	58.9

Vibration Monitoring was conducted between May 16th, 2014 and May 27th, 2014. Monitoring was conducted using Instantel Blastmate II and Minimate Plus vibration monitors. Monitors were installed in ground, in close proximity to noise level monitors. Measurements were completed using the Peak Particle Velocity (PPV[5]). Data collected during periods of inclement weather (wind speeds above 50km/h, severe precipitation) were excluded from analysis. A summary of the vibration monitoring is presented in Table 4 with detailed vibration measurement data in Appendix B. Measurement data was also converted into vibration levels for use in the assessment of human response to vibration levels due to the project.

Table 4: Baseline Vibration Monitoring Results

Monitoring Location	Time Period[6]	Minimum PPV (mm/s)	Maximum PPV (mm/s)	Average PPV (mm/s)	Standard Deviation (mm/s)	Number of Samples[7]	Weighted Average PPV (mm/s)	V_{rms}[8] [mm/s]	L_v[9] [VdB]
Loc1 – Between Pelican Gate and Elana Drive on Finch Ave. West	Daytime	0.1270	0.7300	0.2889	0.0670	469	0.2698	0.0675	68.5
	Evening	0.1270	0.4130	0.2651	0.0543	174			
	Night time	0.1110	0.5560	0.2464	0.0662	346			
Loc2 – West side of Wheatsheaf Crescent	Daytime	0.0476	0.3970	0.0743	0.0109	15994	0.0764	0.0191	57.5
	Evening	0.0476	0.2380	0.0759	0.0089	5760			
	Night time	0.0794	0.2060	0.0797	0.0040	11520			
Loc3 – East side of Wheatsheaf Crescent	Daytime	0.1270	0.5080	0.1822	0.0649	1456	0.2074	0.0519	66.2
	Evening	0.1270	0.3810	0.2024	0.0629	522			
	Night time	0.1270	0.2540	0.2452	0.0322	1042			
Loc4 – On York Gate Blvd., between Hullmar Drive and Jane St.	Daytime	0.0794	0.9840	0.1487	0.1179	174	0.1384	0.0346	62.7
	Evening	0.0794	0.5400	0.1558	0.0991	64			
	Night time	0.0794	0.9370	0.1158	0.0965	128			

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[5] *The maximum instantaneous particle velocity in a medium set in motion by a vibratory force. This is the typical metric used in the assessment of building damage potential, human response to vibration can be derived from PPV.*

[6] *Daytime is defined as the hours between 07:00 to 19:00 hours, evening is defined as the hours between 19:00 to 23:00 hours, night time is defined as the hours between 23:00 to 07:00 hours.*

[7] *Indicates the number of samples used for statistics. Data collected during inclement weather was not included in statistical analysis.*

[8] *Ratio between Peak Particle Velocity and the Root Mean Square amplitude (crest factor) was assumed to be 4, which is typical for ground borne vibration from trains.*

[9] *Reference velocity level of 25.4 nm/s – see criteria section for discussion of* L_v

The above results indicate that the PPV levels were between approximately 0.1 and 0.3 mm/s. Isolated high vibration events that were not characteristic of the data and did not repeat were likely due to interference at the unit from events such as lawn mowing adjacent to the unit and individuals bumping into the unit. The vibration levels were roughly around the threshold of human perception but below the criterion for residential areas during the night time (criteria further discussed in following sections). This is typical of areas near transportation corridors.

3. Assessment Methodology

For this project, there are two distinct stages of noise and vibration impacts, during:

- Construction
- Operations

As such, the noise and vibration impacts for each of these two stages have been assessed separately. The assessment of the operations of the proposed Facility was assessed using a three part approach. In:

- Part 1, four Alternative Designs were assessed for noise and vibration impacts, as well as some design guidance to assist in the development of a Preferred Design.
- Part 2 of the operations assessment reviews the Preferred Design and provides preliminary mitigation for further refinement during detailed design.
- Part 3 of the operations assessment reviews the noise effects of the Facility on the road right of way and effects on the noise results from the previously completed environmental assessment of the Finch West LRT line.

Noise and vibration criteria are presented in the following sub-sections.

3.1 Noise Criteria

Excessive noise may interfere with human comfort and enjoyment from the use of certain spaces. The primary metric for measuring noise impact is the change in noise level above existing noise levels. Table 5 below represents the perceived impact of changes in sound level. The significance of the noise impact by noise level difference is also presented in Table 5. The basis of comparison is usually the average background noise levels. For the purposes of this project, the average 1 hour background noise level was compared to the predicted 1 hour noise levels from the proposed Facility.

Table 5: Perceived Impact of Increased Sound Levels[10]

Increased Sound Level Above Ambient (dB)	Perception	Perceived Impact
0 to 3	Potentially Perceptible	Minor
3 to 5	Perceptible	Low
5 to 10	Up to twice as loud	Medium
Greater than 10	Twice as loud or greater	High

As the Facility is within the Province of Ontario, and within the City of Toronto, and a source of stationary noise, the operational noise of the Facility is subject to compliance with Ministry of the Environment and Climate Change (MOECC) publication NPC-300. Mobile equipment, while operating within the confines of a facility, is also included

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[10] *Adapted from "*Engineering Noise Control, Theory and Practice*" 4th edition, David A. Bies and Colin H. Hansen, 2009, and ISO R1996-1971E*

in the assessment of stationary noise. Once mobile equipment exits a facility, it is considered part of the traffic in the public right of way and included in the assessment of the associated transportation corridor.

The noise level limits for onsite noise sources, as noted in NPC-300 and assessed based upon the worst case hour of operation (L_{EQ1hr}), are the higher of:

- the minimum background noise level that occurs or is likely to occur during the operation of the noise sources under assessment; or
- the minimum exclusionary limits as set out in Tables B-1 and B-2 of NPC-300, consolidated into Table 6 below.

Table 6: Minimum Exclusionary Limits – Class 2 Areas – NPC-300

Assessment Location	Time of Day	Exclusion Limit [dBA]
Outdoor Living Area	Daytime – 07:00 -19:00	50
	Evening – 19:00 – 23:00	45
	Night time – 23:00 – 07:00	Not Applicable
Plane of Window	Daytime – 07:00 -19:00	50
	Evening – 19:00 – 23:00	50
	Night time – 23:00 – 07:00	45

The resultant preliminary operational noise level limits are presented in Table 7. Comparison between the background noise level limits, in Table 2, and the minimum exclusionary limits in Table 6, indicates that in most cases the minimum background noise level will be set as the noise level limit for assessment under NPC-300. In the situations where this is not the case the minimum exclusionary limits were applicable (locations represented by the monitoring locations on Wheatsheaf during the night time and locations represented by the West Wheatsheaf monitor during the daytime). Note that the noise level limits for the outdoor living area and the plane of window are the same for this project (due to the measured noise levels) and have been presented as such in Table 7. Note that the background noise levels at Monitoring Location 4 have been adjusted to account for difference in setback distance of the assessed locations relative to Jane Street (approximately double distance as monitor).

Table 7: Preliminary Onsite Operational Noise Level Limits

Monitoring Location	Time Period[11]	Minimum (1 hour L_{EQ} dBA)	Resulting Limit (1 hour L_{EQ} dBA)
Loc1 – Between Pelican Gate and Elana Drive on Finch Ave. West	Daytime	67	67
	Evening	68	68
	Night time	63	63
Loc2 – West side of Wheatsheaf Crescent	Daytime	48	50
	Evening	51	51
	Night time	42	45
Loc3 – East side of Wheatsheaf Crescent	Daytime	50	50
	Evening	50	50
	Night time	42	45
Loc4 – On York Gate Blvd.,	Daytime	54	54

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[11] *Daytime is defined as the hours between 07:00 to 19:00 hours, evening is defined as the hours between 19:00 to 23:00 hours, night time is defined as the hours between 23:00 to 07:00 hours.*

Monitoring Location	Time Period[11]	Minimum (1 hour L_{EQ} dBA)	Resulting Limit (1 hour L_{EQ} dBA)
between Hullmar Drive and Jane St.	Evening	58	58
	Night time	50	50

As mentioned above, once mobile equipment exits the Facility, they are considered as part of the traffic in the public right of way and included in the assessment of the associated transportation corridor. In accordance with the approved Finch West LRT Environmental Assessment[12], transit vehicles located off the Maintenance and Storage Facility were assessed using the MOEE/TTC Draft Protocol for Noise and Vibration Assessment for the Proposed Scarborough Rapid Transit Extension document dated May 11, 1993. Noise levels for the transit operations within the public right of way are assessed using the sixteen hour daytime and eight hour night time equivalent sound levels. Noise level criteria are set as the higher of the existing day/night time ambient noise levels or the minimum noise levels set out in Table 8 below. Noise control is only warranted if the noise level criteria are exceeded by more than 5 dB.

Table 8: Minimum Noise Level Criteria for Transportation (TTC) Corridors

Time Period	Limit [dBA]
16 hour day	55
8 hour night	50

In conjunction with the background noise levels presented in Table 3 and considering the LRT vehicles enter the public right of way immediately north of Finch on York Gate Boulevard (only receptors on Finch affected), the resulting noise level criteria for the assessment of the offsite vehicles are presented in Table 9[13] below.

Table 9: Resultant Noise Level Criteria – Transportation (TTC) Corridors – Finch Receptors

Time Period	Limit [dBA]
16 hour day	69.4
8 hour night	66.6

3.2 Vibration Criteria

There are two main concerns during the assessment of vibration impacts: building damage, and human comfort. Building damage may occur when there are excessive vibration impacts on a structure. Depending on the type of structure, there are different thresholds of damage. The assessment for potential building damage has been based upon the methodology as presented in the United States Federal Transit Administration's *Transit Noise and Vibration Impact Assessment* (FTA) document, which defines and provides threshold vibration damage limits for four different building types; these are summarized in Table 10.

Table 10: Building Type Definitions

Building Type	Description	Vibration Damage Criteria Peak Particle Velocity (mm/s)

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[12] *Etobicoke-Finch west Light Rail Transit – Transit Project Assessment – Environmental Project Report, Prepared for the Toronto Transit Commission/City of Toronto, Delcan Corporation, March 2010.*

[13] *Noise level criteria are set as the higher of the existing ambient noise levels or the minimum noise levels set out in Table 8*

Building Type	Description	Vibration Damage Criteria Peak Particle Velocity (mm/s)
Type I	Reinforced-concrete, steel or timber (no plaster)	12.70
Type II	Engineered concrete and masonry (no plaster)	7.62
Type III	Non-engineered timber and masonry buildings	5.08
Type IV	Buildings extremely susceptible to vibration damage	3.05

Construction vibration is also subject to City of Toronto By-law 514-2008, which requires that a vibration control form and study be submitted as part of a building permit application should certain types of construction operations be used, such as deep foundations. This assessment identifies the requirement for additional vibration study to be submitted as part of a building permit application, and the potential requirement for construction vibration monitoring and building condition surveys. The requirement for further assessment is triggered when a “zone of influence” (an area where construction vibration is predicted to be equal to or greater than 5 mm/s) extends beyond the legal boundaries of the construction site and encompasses any buildings on adjacent properties.

Human comfort is assessed based upon differing levels of response to vibration levels. The latest MOE[14]/TTC vibration criteria is documented in the 1993 *Draft Protocol for Noise and Vibration Assessment for the Proposed Scarborough Rapid Transit Extension*, in which the vibration from the transit vehicles is limited to 0.1 mm/s root mean square velocity (V_{rms}) at a point of reception. This equates to a vibration velocity level of 72 VdB, which is in line with the criteria as presented in the FTA document, but does not include limits for other conditions and types of vibration sensitive spaces. Therefore the FTA document criteria were used in this assessment. Table 11 presents the threshold levels for varying human responses to vibration, as well as the criteria for high resolution equipment. The assessment of human annoyance to vibration was also based upon methodology as presented in the FTA document.

Table 11: Human and Sensitive Equipment Vibration Criteria

Receptor Type	Limit [VdB][15]	Description
Offices and non-sensitive spaces	85.0	Annoyance in Sensitive Spaces
Institutional – Daytime Primary	75.0	Noticeable Vibration – Likely Annoying
Residential Night and Operating Rooms	72.0	Generally not Noticeable Vibration
Threshold of Perception	65.0	Barely Perceptible Vibration
MRI and High Resolution equipment	54.0	Equipment with 1 micron detail size

Ground borne noise has the potential to cause situations where there are excessive interior noise levels. Ground borne noise is caused when vibration is transmitted into a building structure and reradiated as sound by the interior room surfaces. Ontario currently does not have an established limit for ground borne noise. However, the FTA guide has a recommended limit within sleeping quarters of 35 dBA. Generally ground borne noise is not considered an issue when the exterior vibration levels are met. This is confirmed when taking the exterior vibration limit of 72 VdB and calculating the interior noise levels using methodology as presented in the FTA guide, which results in an interior noise level of approximately 35 dBA.

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[14] *Now the Ministry of the Environment and Climate Change (MOECC)*

[15] *Vibration velocity level referenced to 1 micro-inch/second [25.4 nanometres/second], based upon the root mean square vibration velocity* (V_{RMS})

4. Construction Assessment

Construction noise was reviewed based upon the expected equipment, construction phases, and expected operational areas. The majority of the construction activities will occur within the property line of the proposed Facility; however, there will be some construction outside of the property for the rail connection to the main Finch West Line. A projected list of typical construction equipment for each phase of construction is provided in Table 12.

Table 12: Estimated Construction Equipment by Construction Type

Equipment Description	Site Preparation and Utility Relocation	Excavation and Grading	Building Construction	Track Installation	Piled Foundation Construction Options		
					Impact Hammer	Vibratory Sonic	Drilled
Excavator	1	2	1	1	-	-	-
Backhoe	2	2	-	-	-	-	-
Bulldozer	1	1	-	-	-	-	-
Grader	1	1	-	-	-	-	-
Skid Steers	2	2	2	2	1	1	1
Compaction Machine	1	1	-	-	-	-	-
Crane - Mobile	1	-	2	2	1	1	1
Ballast Regulator	-	-	-	1	-	-	-
Tamper Machine	-	-	-	1	-	-	-
Semi-Trucks/hr	2	2	2	2	2	2	1
Concrete Pump Truck	-	1	2	-	-	-	1
Cement Trucks/hr	-	2	4	-	-	-	2
Dump Trucks/hr	4	2	-	-	-	-	1
Generator	1	1	1	1	1	1	1
Vibratory Roller	-	-	-	1	-	-	-
Impact Pile	-	-	-	-	1	-	-
Sonic or Vibratory Piler	-	-	-	-	-	1	-
Drill Rig	-	-	-	-	-	-	1

4.1 Noise

4.1.1 Assessment

To predict the maximum construction impact at each noise sensitive area during each phase of construction, several scenarios were modeled for each phase of construction. Each scenario considered the active construction areas generating the greatest noise impacts for each particular noise sensitive area. The active construction areas were assumed to be approximately 50m x 100m for onsite construction and 30m x 15m for offsite construction. For the purposes of this assessment, the noise impact was defined as the difference between the project (construction) noise levels, and the existing background noise levels.

Construction equipment noise source information was sourced from the Federal Highway Administration's *Roadway Construction Noise Model* (RCNM). Noise sources were input into an environmental noise prediction algorithm (ISO 9613-2 implemented in Cadna/A software package) to predict the noise levels at the most exposed receiver locations within each noise sensitive area. The noise sources were modeled in three different locations for each phase of construction, to determine the maximum noise impacts due to construction operations. The predicted noise levels were then compared to the background noise levels to determine the maximum noise impacts due to construction of the project. A summary of the calculated construction noise impacts are presented in Table 13.

Table 13: Noise Impact in dB – Construction

Receivers	**Time Period**	**Construction Inside Property Limits**							**Construction Outside Property Limits (Track)**	
		Site Prep.	**Excavation**	**Building Construction**	**Track**	**Piled Foundation Construction Options**			**Excavation**	**Track**
						Impact	**Sonic**	**Drilled**		
Pelican at Finch – Long term Care Facility	Day	7	4	1	3	15	10	2	7	6
	Evening	7	4	1	3	15	10	2	7	6
	Night	10	7	4	6	18	13	5	10	9
Norfinch at Finch – Medical Office	Day	5	5	2	4	13	8	1	-	-
	Evening	5	5	2	4	13	8	1	-	-
	Night	8	8	5	7	16	11	4	-	-
Norfinch – Long term Care Facility	Day	9	10	7	9	17	12	5	-	-
	Evening	9	10	7	9	17	12	5	-	-
	Night	11	12	9	11	19	14	7	1	0
Wheatsheaf – Residence (west)	Day	7	7	4	6	15	9	3	3	2
	Evening	5	5	2	4	13	7	1	1	0
	Night	10	10	7	9	18	12	6	6	5
York Gate at Hullmar – Residence	Day	-	-	-	-	3	0	-	2	1
	Evening	-	-	-	-	-	-	-	-	-
	Night	2	2	0	1	7	4	-	6	5
Elana Drive at Finch – Residence	Day	5	2	-	1	9	3	-	16	15
	Evening	5	2	-	1	9	3	-	16	15
	Night	8	5	2	4	12	6	0	19	18

As shown in Table 13, the noise impact is highest during the night time hours, and during impact or sonic piling in all time periods. Noise impacts are also expected to be high at noise sensitive locations along Finch during construction of the track work outside of the property limits. Human annoyance due to construction noise is expected without the implementation of noise control measures. The sound quality from the construction of this project is expected to be typical of construction activities at other civil engineering projects.

4.1.2 Guidance

As noted in Table 13, construction phases can result in medium to high noise impacts in the worst case operating locations. This can be a cause of negative community response and may cause a risk of community action.

The following general guidance is provided to aid in the development of a construction noise management plan:

- Avoid the use of impact or sonic piling machines unless noise control (i.e. some sort of enclosure or acoustic shroud) is used. Specific requirements of noise control are to be determined during detail design based upon exact locations of operations. Avoid piling operations at night/evening.

- Abide by all local noise by-laws and policies, unless a permit for exemption is obtained
- Use equipment compliant with MOE publication NPC-115 and NPC-118
- Provide occupants of buildings in the vicinity of planned construction activity with the contact details of a person who can assist them with resolving issues related to construction noise
- Limit construction noise levels outside of construction areas (public areas) to a maximum 85 dBA to be compliant with Occupational Health and Safety requirements
- Ensure all internal combustion engines are fitted with appropriate muffler systems
- Take advantage of shielding from existing buildings to shield residential locations from construction equipment
- Maximize distance between construction equipment operations and noise sensitive receivers
- Keep equipment in good maintenance
- Limit equipment idling time to the minimum time necessary to complete specified tasks
- Advise nearby residents of significant noise generating activities to minimize disruption
- Consult with likely affected persons prior to commencement of works
- Set construction noise level limits appropriate to project acceptable community response
    - Guidance is available in ISO R1996 and the FTA guide. Construction noise levels less than 5 dB above the pre-construction background are typically acceptable.

The above guidance will be refined during detail design to account for refined considerations such as:

- Time of operation
- Exact areas of operation
- Size of equipment
- Concurrent usages
- Refined staging plans

4.1.3 Required Mitigation

A construction noise management plan is required to address the construction noise from this project. The construction noise management plan is required to:

- Detail a construction noise complaint process and action plan to address construction noise complaints
- Detail how construction equipment will meet guideline limits documented in NPC-115 and NPC-118
- Detail what measures are being taken to be compliant with City of Toronto noise by-laws
- Detail what noise mitigation measures are being implemented
- Detail what actions are being taken to minimize the potential for noise complaints and noise impact on surround noise sensitive receivers
- Develop a monitoring/verification plan to demonstrate that the mitigation measures above are appropriate, functioning correctly, and that acceptable noise levels at noise sensitive receivers are maintained for the duration of construction.

4.2 Vibration

4.2.1 Assessment

The prediction of construction vibration levels was based upon methodology presented in the FTA guide. Vibration was predicted at the smallest separation distance between a vibration sensitive receptor and the closest anticipated point of equipment operation. The separation distances, vibration levels, and assessment of building damage potential are presented in Table 14 below. Nearby residential areas surrounding the facility were assumed to be Type III buildings while commercial locations (hotels, nursing homes) were assumed to be Type II.

Table 14: Vibration Building Damage Assessment

Equipment	Reference PPV (in/s at 25 ft / 7.62 m)	Smallest Source Receiver Distance (m)	PPV at Receiver (mm/s)	Building Damage (Type II)	Building Damage (Type III)
Excavator	0.003	22	0.0155	None	None
Backhoe	0.003	22	0.0155	None	None
Bulldozer	0.089	22	0.4608	None	None
Grader	0.003	22	0.0155	None	None
Compaction Machine	0.210	22	1.0873	None	None
Ballast Regulator	0.003	22	0.0155	None	None
Tamper Machine	0.003	22	0.0155	None	None
Semi Trucks	0.076	22	0.3935	None	None
Concrete Pump Truck	0.076	22	0.3935	None	None
Cement Trucks	0.076	22	0.3935	None	None
Dump Trucks	0.076	22	0.3935	None	None
Vibratory Roller	0.210	22	1.0873	None	None
Impact Pile	1.518	37	3.6036	None	None
Sonic or Vibratory Piler	0.734	37	1.7424	None	None
Drill Rig	0.089	37	0.2113	None	None

The above table indicates that no building damage is expected to occur due to construction operations. These results also indicate that a zone of influence (as per City of Toronto By-law 514) will not encompass buildings not associated with this project.

Similar to the assessment of vibration damage, the assessment of human annoyance was based on the smallest separation distance between the vibration sensitive receivers and area of equipment operation. There is the potential for vibration impact on high sensitivity machines (up to 1 micron detail size, for example some MRI machines) in the medical buildings near the southwest corner of the project site. As the criteria for high sensitivity equipment, and a different separation distance, is different from the residential locations, the assessment of vibration impact on high sensitivity machines was conducted in addition to the assessment of human annoyance. The results of the assessment are presented in Table 15.

Table 15: Human Annoyance and Sensitive Equipment Assessment

Equipment	Reference Level (VdB at 25 ft / 7.62 m)	Human Annoyance			High Sensitivity Equipment		
		Smallest Source Receiver Distance (m)	Lv (VdB) at Receiver	Human Response	Potential Sensitive Equipment Distance (m)	Lv (VdB) at Receiver	Exceeds Sensitive Equipment Criteria
Excavator	58	22	44.19	None	37	37.41	No
Backhoe	58	22	44.19	None	37	37.41	No
Bulldozer	87	22	73.19	Perceptible	37	66.41	Yes
Grader	58	22	44.19	None	37	37.41	No
Compaction Machine	94	22	80.19	Likely Annoyance	37	73.41	Yes
Ballast Regulator	58	22	44.19	None	37	37.41	No

Equipment	Reference Level (VdB at 25 ft / 7.62 m)	Human Annoyance			High Sensitivity Equipment		
		Smallest Source Receiver Distance (m)	Lv (VdB) at Receiver	Human Response	Potential Sensitive Equipment Distance (m)	Lv (VdB) at Receiver	Exceeds Sensitive Equipment Criteria
Tamper Machine	58	22	44.19	None	37	37.41	No
Semi Trucks	86	22	72.19	Perceptible	37	65.41	Yes
Concrete Pump Truck	86	22	72.19	Perceptible	37	65.41	Yes
Cement Trucks	86	22	72.19	Perceptible	37	65.41	Yes
Dump Trucks	86	22	72.19	Perceptible	37	65.41	Yes
Vibratory Roller	94	22	80.19	Likely Annoyance	37	73.41	Yes
Impact Pile	112	37	91.41	Annoyance	37	91.41	Yes
Sonic or Vibratory Piler	105	37	84.41	Annoyance	37	84.41	Yes
Drill Rig	87	37	66.41	Perceptible	37	66.41	Yes

The results in the above table indicate that humans may be annoyed by vibration during piling operations with the use of impact or vibratory methods at the closest point of operation to sensitive receivers. The results also indicate that annoyance will likely occur with the use of a vibratory roller or compaction machine at the closest point of operation to sensitive receivers.

The assessment of construction vibration impact on high sensitivity equipment indicates that most of the expected construction equipment operating at the closest potential point of operation will negatively affect high sensitive equipment. Guidance to control negative effects is presented in the following sub-section.

4.2.2 Guidance

As noted in the above section, some construction activities may have a negative impact on the surrounding sensitive receivers. This section provides general guidance on vibration control to aid in furthering the design.

The results in Table 14 indicate that building damage should not be an issue on this project. The results also indicate that no buildings fall within a zone of influence (City of Toronto By-law 514) from the construction activities, and By-law requirements such as building inspections and submittal of a monitoring program to the City of Toronto are not triggered. The zone of influence is required to be reviewed as part of the building permit application and should be revised if necessary during detail design. To aid in the development of a zone of influence during detail design, zone of influence radiuses by equipment type are presented in Table 16 below.

Table 16: City of Toronto Zone of Influence by Equipment

Equipment	Zone of Influence Radius[m]
Excavator	0.5
Backhoe	0.5
Bulldozer	4.4
Grader	0.5
Compaction Machine	7.9

Equipment	Zone of Influence Radius[m]
Ballast Regulator	0.5
Tamper Machine	0.5
Semi Trucks	4.0
Concrete Pump Truck	4.0
Cement Trucks	4.0
Dump Trucks	4.0
Vibratory Roller	7.9
Impact Pile	16.6
Sonic or Vibratory Pile	6.8
Drill Rig	4.4

The results in Table 15 indicates that vibration criteria for high sensitivity equipment potentially located in the medical buildings near the southwest corner of the Facility property could be exceeded by construction vibrations. The following minimum separation distances between construction equipment operations and buildings housing high sensitivity equipment (including Humber River Regional Hospital) are provided.

Table 17: Separation Distance to High Sensitivity Equipment to Avoid Impacts

Equipment	Minimum Separation Distance [m]
Excavator	10
Backhoe	10
Bulldozer	96
Grader	10
Compaction Machine	164
Ballast Regulator	10
Tamper Machine	10
Semi Trucks	89
Concrete Pump Truck	89
Cement Trucks	89
Dump Trucks	89
Vibratory Roller	164
Impact Pile	654
Sonic or Vibratory Pile	382
Drill Rig	96

Additional guidance specific to construction vibration impacts on high sensitivity equipment include:

- Coordinate with the high sensitivity machine operators to arrange construction activities exceeding vibration limits to occur during non-operation of high sensitivity machines
- Reassessment during detail design to determine if construction equipment and operations will be close enough to sensitive equipment to exceed vibration limits
- Arrange site and construction activities such that the vibration limits should not be exceeded
- Use lower vibration methods or equipment with decreasing separation distances from high sensitive machines

The results in Table 15 indicate that pile driving by impact and vibratory methods will exceed human annoyance criteria and be a cause of annoyance at the vibration sensitive areas closest to the points of operation. Compaction machines and vibratory rollers have the potential to cause annoyance. To minimize the annoyance and the potential for building damage, the following is guidance is provided:

- Abide by all local vibration by laws
    - City of Toronto by law 514-2008 requires a vibration study and a vibration control form to be submitted as part of the building permitting application
- Avoid impact or vibratory methods for installation of foundation piles
    - Can be revised depending on the setback distance as determined during detail design.
- Conduct pre construction and post construction building condition assessments at locations near the MSF
- Use lower vibration equipment where feasible (e.g. smaller sized equipment)
- Use lower vibration processes where feasible (e.g. caisson drilling instead of impact piling)
- Operate construction equipment during periods where nearby structures are unoccupied when feasible
- Avoid use of vibration generating equipment during the night time in residential areas, when feasible
- Limit speed of vehicles entering and driving within the site
- Provide smooth surfaces for vehicle movements when feasible
- Inform occupants of buildings in the vicinity of planned construction activity a reasonable amount of time before construction begins
- Provide occupants of buildings in the vicinity of planned construction activity with the contact details of a person who can assist them with resolving issues related to vibration generated by construction
- Operate construction vehicles under lower vibration settings

4.2.3 Required Mitigation

A construction vibration management plan is required to address the construction vibration from this project. The construction vibration management plan is required to:

- Detail how City of Toronto vibration by-law 514 requirements are being met
- Detail what actions are being taken to minimize the perceptible vibration impacts on surrounding sensitive receivers
- Detail vibration mitigation measures being implemented
- Detail construction vibration complaint process and action plan to address perceptible vibration complaints
- Develop a monitoring/verification plan to demonstrate that the mitigation measures above are appropriate, functioning correctly, and that acceptable vibration levels at sensitive receivers are maintained for the duration of construction
- Detail how vibration levels at buildings housing vibration sensitive machinery will be managed to acceptable levels, and how the levels will be monitored/verified for the duration of construction

5. Operations Assessment – Part 1

5.1 Noise

As mentioned above, the assessment of the operations of the proposed Facility has been separated into three parts: Part 1 being the assessment of four Alternative Designs to generate recommendations for input into the development of a ‘Preferred Design’ which is assessed in Part 2; Part 3 reviews the noise impact from the addition of an access from the Facility to the Finch West LRT Line. The four Alternative Designs are presented on Figure 3 to Figure 6. As in the above section, the noise impact was defined as the difference between the project noise levels and the existing background noise levels. The significance of the noise impact by noise level difference is presented in Table 5. The school is considered not noise sensitive during the night time hours (23:00 to 07:00).

The noise from the operation of the Facility can be grouped into three main components:

1. Noise associated with the buildings and their operations
    - Interior operations including wheel truing and vehicle washing
    - Exterior ventilation, exhaust fans, HVAC, compressors, emergency diesel generators
2. Noise from the LRT vehicles traversing over rail junctions
3. Noise from general LRT vehicle movements

Specific noise source information was sourced from similar facilities and adjusted for project specific conditions. For example, the building ventilation was increased in proportion to the anticipated size of the buildings. Modeled noise source information is presented in Appendix C. Noise sources were input into an environmental noise prediction algorithm (ISO 9613-2 implemented in Cadna/A software package) to predict the noise levels at the most exposed receiver locations within each noise sensitive area. Building shielding effects were not considered in Part 1 analysis. Vehicles are also modeled as traversing the entire perimeter of the project site before deployment. Applicable noise quality penalties were applied as per NPC104.

The predicted noise levels were then compared to the background noise levels to determine the perceived noise impacts due to the operations of the Facility for each Alternative. Noise levels from the Facility were also compared with operational noise level limits as discussed in Section 3.1. The noise assessment for each Alternative is presented in the following sub-sections.

Note that the perceived noise impact is based upon the difference between project noise levels and the average background noise. The assessment against the operation noise level limit is based on the predicted project related noise levels and the applicable noise level limits.

5.1.1 Alternative 1

5.1.1.1 Assessment

The Alternative Design reviewed for this section is shown on Figure 3.

Table 18: Perceived Noise Impact

Assessment Locations	Maximum Noise Impact [dB]			Perceived Noise Impact		
	Day	Evening	Night	Day	Evening	Night
Wheatsheaf – Residence 1 (east)	12	12	15	High	High	High
Wheatsheaf – Residence 2 (west)	11	9	14	High	Medium	High
York Gate at Hullmar – Apartment	5	1	10	Medium	Minor	High
York Gate at Hullmar – Residence	4	-	9	Low	-	Medium
Elana Drive at Finch – Residence	-	-	4	-	-	Low
Pelican at Finch – Long term Care Facility	-	-	3	-	-	Low
Pelican at Finch – Medical Office	-	-	3	-	-	Low
Norfinch at Finch – Medical Office	-	-	3	-	-	Low
Norfinch at Hydro Corridor– School	14	12	-	High	High	-

Table 19: Operational Noise Level Limit Assessment

Assessment Locations	Predicted Noise Level [dBA]			Criteria			Meet Criteria		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
Wheatsheaf – Residence 1 (east)	68	68	69	50	50	45	No	No	No
Wheatsheaf – Residence 2 (west)	68	68	68	50	51	45	No	No	No
York Gate at Hullmar – Apartment	64	64	65	54	58	50	No	No	No
York Gate at Hullmar – Residence	63	63	64	54	58	50	No	No	No
Elana Drive at Finch – Residence	68	68	70	67	68	63	No	Yes	No
Pelican at Finch – Long term Care Facility	67	67	69	67	68	63	Yes	Yes	No
Pelican at Finch – Medical Office	67	67	69	67	68	63	Yes	Yes	No
Norfinch at Finch – Medical Office	67	67	69	67	68	63	Yes	Yes	No
Norfinch at Hydro Corridor– School	71	71	-	50	51	-	No	No	-

The results in the above tables indicate that there will be a high noise impact at noise sensitive points of reception. The results indicate that without noise control measures, the Facility may be out of compliance with the MOECC noise guidelines in most cases. Noise control is required to decrease the noise impact from the proposed Facility. The following is a preliminary list of noise sources requiring noise control:

- Wheel truing
- Emergency generators
- Roof top air conditioning units
- Crossovers
- Wheel squeal
- Bay doors on main maintenance building / main repair shop
- Brake testing track
- Compressors

5.1.1.2 Design Guidance

Positioning and type of noise sources requiring noise control limit the options available to be implemented. For example, noise barriers cannot be placed crossing track work. The following general guidance is provided to aid in developing the Preferred Design using similar layouts to this Alternative Design:

- Main maintenance shop / main repair shop
  - Close shop bay doors during night time hours unless being opened to move transit vehicles
  - Open shop bay doors at most half way unless being opened to move transit vehicles
  - Close bay doors while completing wheel truing operations
  - Specify sound power level of compressor units – maximum sound power of approximately 86 dBA
- Specify operations building air conditioning units to a maximum sound power level of approximately 87 dBA
- Specify maintenance of way building compressor to a maximum sound power level of approximately 86 dBA
- Include noise specifications for roof top equipment based upon final number, location, and capacities
- Have the vehicles take the most direct route from staging/storage areas to street as possible
- Limit maximum night time hourly deployment to 30 per hour (currently 50 per hour)
- Distribute shunting of LRT vehicles as evenly as possible across site
- Attempt to keep turning radiuses greater than 1000 ft (300 m)
  - Make provisions for rail greasers for curves less than 300 metre radius/radius less than 100 times the truck wheel base

- Operate generators in compliance with NPC300
    - Specify generators to be housed in sound rated enclosures with sound power rating no greater than 100 dBA. To be tested during the daytime hours only.
- Limit LRT vehicle speed to 10 km/hr over onsite cross overs
- Noise barrier along northern property line in approximately of 8 metres in height
- Noise barrier along property line with school approximately 4 metres in height

Noise barriers may be reduced through use of building shielding and site layout, and vehicle deployment schedule.

5.1.2 Alternative 2

5.1.2.1 Assessment

The Alternative Design reviewed for this section is shown on Figure 4.

Table 20: Perceived Noise Impact

Assessment Locations	Maximum Noise Impact [dB]			Perceived Noise Impact		
	Day	Evening	Night	Day	Evening	Night
Wheatsheaf – Residence 1 (east)	8	8	12	Medium	Medium	High
Wheatsheaf – Residence 2 (west)	7	5	12	Medium	Medium	High
York Gate at Hullmar – Apartment	4	-	8	Low	-	Medium
York Gate at Hullmar – Residence	4	0	9	Low	Minor	Medium
Elana Drive at Finch – Residence	6	6	9	Medium	Medium	Medium
Pelican at Finch – Long term Care Facility	5	5	9	Medium	Medium	Medium
Pelican at Finch – Medical Office	1	1	6	Minor	Minor	Medium
Norfinch at Finch – Medical Office	-	-	5	-	-	Medium
Norfinch at Hydro Corridor– School	11	9	-	High	Medium	-

Table 21: Operational Noise Level Limit Assessment

Assessment Locations	Predicted Noise Level [dBA]			Criteria			Meet Criteria		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
Wheatsheaf – Residence 1 (east)	64	64	66	50	50	45	No	No	No
Wheatsheaf – Residence 2 (west)	64	64	66	50	51	45	No	No	No
York Gate at Hullmar – Apartment	63	63	63	54	58	50	No	No	No
York Gate at Hullmar – Residence	63	63	64	54	58	50	No	No	No
Elana Drive at Finch – Residence	75	75	75	67	68	63	No	No	No
Pelican at Finch – Long term Care Facility	74	74	75	67	68	63	No	No	No
Pelican at Finch – Medical Office	70	70	72	67	68	63	No	No	No
Norfinch at Finch – Medical Office	69	69	71	67	68	63	No	No	No
Norfinch at Hydro Corridor– School	68	68	-	50	51	-	No	No	-

The results in the above tables indicate that there will be a high noise impact at noise sensitive points of reception. The results also indicate that without noise control measures, the Facility would be out of compliance with the MOECC noise guidelines in most cases. Noise control is required to decrease the noise impact from the proposed Facility. The following is a preliminary list of noise sources requiring noise control:

- Wheel truing
- Emergency generators
- Roof top air conditioning units
- Crossovers
- Wheel squeal
- Bay doors on main maintenance building / main repair shop
- Bay doors on maintenance of way building
- Brake testing track
- Compressors

5.1.2.2 Design Guidance

Positioning and type of noise sources requiring noise control limit the options available to be implemented. For example, noise barriers cannot be placed crossing track work. The following general guidance is provided to aid in developing the Preferred Design using similar layouts to this Alternative Design:

- Main maintenance building / main repair shop
    - Close bay doors while completing wheel truing operations
    - Specify compressor units to have a maximum sound power level of approximately 91 dBA
    - Close shop bay doors during night time hours unless being opened to move transit vehicles
- Maintenance of way building
    - Close shop bay doors during night time hours
    - Specify compressor unit to have a maximum sound power level of approximately 91 dBA
- Specify the two operations building air conditioning units to have a maximum sound power level of approximately 92 dBA
- Include noise specifications for roof top equipment based upon final number, location, and capacities
- Have the vehicles take the most direct route from staging/storage areas to street as possible
- Limit maximum night time hourly deployment to 30 per hour (currently 50 per hour)
- Distribute shunting of LRT vehicles as evenly as possible across site
- Attempt to keep turning radiuses greater than 1000 ft (300 m)
    - Make provisions for rail greasers for curves less than 300 metre radius/radius less than 100 times the truck wheel base
- Operate generators in compliance with NPC300
    - Specify generators to be housed in sound rated enclosures with sound power rating no greater than 105 dBA. To be tested during the daytime hours only.
- Limit LRT vehicle speed to 10 km/hr over onsite cross overs
- Noise barrier along northern property line in excess of 5 metres in height
- Noise barrier along property line with school approximately 4 metres in height

Noise barriers may be reduced through use of building shielding and site layout, and vehicle deployment schedule.

5.1.3 Alternative 3

5.1.3.1 Assessment

The Alternative Design reviewed for this section is shown on Figure 5.

Table 22: Perceived Noise Impact

Assessment Locations	Maximum Noise Impact [dB]			Perceived Noise Impact		
	Day	Evening	Night	Day	Evening	Night
Wheatsheaf – Residence 1 (east)	6	6	10	Medium	Medium	High
Wheatsheaf – Residence 2 (west)	6	4	10	Medium	Low	High
York Gate at Hullmar – Apartment	1	-	6	Minor	-	Medium
York Gate at Hullmar – Residence	1	-	7	Minor	-	Medium
Elana Drive at Finch – Residence	1	1	5	Minor	Minor	Medium
Pelican at Finch – Long term Care Facility	4	4	8	Low	Low	Medium
Pelican at Finch – Medical Office	8	8	12	Medium	Medium	High
Norfinch at Finch – Medical Office	7	7	11	Medium	Medium	High
Norfinch at Hydro Corridor– School	14	12	-	High	High	-

Table 23: Operational Noise Level Limit Assessment

Assessment Locations	Predicted Noise Level [dBA]			Criteria			Meet Criteria		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
Wheatsheaf – Residence 1 (east)	62	62	64	50	50	45	No	No	No
Wheatsheaf – Residence 2 (west)	63	63	64	50	51	45	No	No	No
York Gate at Hullmar – Apartment	60	60	61	54	58	50	No	No	No
York Gate at Hullmar – Residence	60	60	62	54	58	50	No	No	No
Elana Drive at Finch – Residence	70	70	71	67	68	63	No	No	No
Pelican at Finch – Long term Care Facility	73	73	74	67	68	63	No	No	No
Pelican at Finch – Medical Office	77	77	78	67	68	63	No	No	No
Norfinch at Finch – Medical Office	76	76	77	67	68	63	No	No	No
Norfinch at Hydro Corridor– School	71	71	-	50	51	-	No	No	-

The results in the above tables indicate that there will be a high noise impact at noise sensitive points of reception. As for the previous cases, the results indicate that without noise control measures, the Facility may be out of compliance with the MOECC noise guidelines in most cases. Noise control is required to decrease the noise impact from the proposed Facility. The following is a preliminary list of noise sources requiring noise control:

- Wheel truing
- Emergency generators
- Roof top air conditioning units
- Crossovers
- Wheel squeal
- Bay doors on main maintenance building / main repair shop
- Bay doors on maintenance of way building
- Brake testing track
- Compressors

5.1.3.2 Design Guidance

Positioning and type of noise sources requiring noise control limit the options available to be implemented. For example, noise barriers cannot be placed crossing track work. The following general guidance is provided to aid in developing the Preferred Design using similar layouts to this Alternative Design:

- Main maintenance building / main repair shop
  - Bay doors to be open to at most ¼ of the way, unless being opened to move transit vehicles
  - Close shop bay doors during night time hours unless being opened to move transit vehicles
  - Close bay doors while completing wheel truing operations
  - Specify compressor units to have a maximum sound power level of approximately 96 dBA
- Maintenance of way building
  - Bay doors to be open to at most ½, unless being opened to move materials or equipment
  - Close shop bay doors during the night time hours
  - Specify compressor unit to have a maximum sound power level of approximately 96 dBA
- Specify operations building 2 air conditioning units to have a maximum sound power level of approximately 97 dBA
- Include noise specifications for roof top equipment based upon final number, location, and capacities
- Have the vehicles take the most direct route from staging/storage areas to street as possible
- Limit maximum night time hourly deployment to 30 per hour (currently 50 per hour)
- Distribute shunting of LRT vehicles as evenly as possible across site
- Attempt to keep turning radiuses greater than 1000 ft (300 m)
  - Make provisions for rail greasers for curves less than 300 metre radius/radius less than 100 times the truck wheel base
- Operate generators in compliance with NPC300
  - Specify generators to be housed in sound rated enclosures with sound power rating no greater than 106 dBA. To be tested during the daytime hours only.
- Limit LRT vehicle speed to 10 km/hr over onsite cross overs
- Limit LRT vehicle speed to 10 km/hr on site
- Noise barrier along northern property line, 6.5 metres in height
- Noise barrier along the property line shared by the school, approximately 4 metres in height

Noise barriers may be reduced through use of building shielding and site layout, and vehicle deployment schedule.

5.1.4 Alternative 4

5.1.4.1 Assessment

The Alternative Design reviewed for this section is shown on Figure 6.

Table 24: Perceived Noise Impact

Assessment Locations	Maximum Noise Impact [dB]			Perceived Noise Impact		
	Day	Evening	Night	Day	Evening	Night
Wheatsheaf – Residence 1 (east)	9	9	12	Medium	Medium	High
Wheatsheaf – Residence 2 (west)	9	7	13	Medium	Medium	High
York Gate at Hullmar – Apartment	1	-	6	Minor	-	Medium
York Gate at Hullmar – Residence	0	-	6	Minor	-	Medium
Elana Drive at Finch – Residence	-	-	3	-	-	Low

Assessment Locations	Maximum Noise Impact [dB]			Perceived Noise Impact		
	Day	Evening	Night	Day	Evening	Night
Pelican at Finch – Long term Care Facility	-	-	4	-	-	Low
Pelican at Finch – Medical Office	0	0	6	Minor	Minor	Medium
Norfinch at Finch – Medical Office	3	3	7	Low	Low	Medium
Norfinch at Hydro Corridor– School	24	22	-	High	High	-

Table 25: Operational Noise Level Limit Assessment

Assessment Locations	Predicted Noise Level [dBA]			Criteria			Meet Criteria		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
Wheatsheaf – Residence 1 (east)	65	65	66	50	50	45	No	No	No
Wheatsheaf – Residence 2 (west)	66	66	67	50	51	45	No	No	No
York Gate at Hullmar – Apartment	60	60	61	54	58	50	No	No	No
York Gate at Hullmar – Residence	59	59	61	54	58	50	No	No	No
Elana Drive at Finch – Residence	67	67	69	67	68	63	Yes	Yes	No
Pelican at Finch – Long term Care Facility	68	68	70	67	68	63	No	Yes	No
Pelican at Finch – Medical Office	69	69	72	67	68	63	No	No	No
Norfinch at Finch – Medical Office	72	72	73	67	68	63	No	No	No
Norfinch at Hydro Corridor– School	81	81	-	50	51	-	No	No	-

The results in the above tables indicate that there will be a high noise impact at noise sensitive points of reception. Again, the results indicate that without noise control measures, the Facility may be out of compliance with the MOECC noise guidelines in most cases. Noise control is required to decrease the noise impact from the proposed Facility. The following is a preliminary list of noise sources requiring noise control:

- Wheel truing
- Emergency generators
- Roof top air conditioning units
- Crossovers
- Wheel squeal
- Bay doors on main maintenance building / main repair shop
- Bay doors on maintenance of way building
- Brake testing track
- Compressors

5.1.4.2 Design Guidance

Positioning and type of noise sources requiring noise control limit the options available to be implemented. For example, noise barriers cannot be placed crossing track work. The following general guidance is provided to aid in developing the Preferred Design using similar layouts to this Alternative Design:

- Main maintenance building / main repair shop
    - Bay doors to be open to at most ¼ of the way, unless being opened to move transit vehicles
    - Close shop bay doors during night time hours unless being opened to move transit vehicles
    - Close bay doors while completing wheel truing operations
    - Specify compressor units to have a maximum sound power level of approximately 81 dBA

- Maintenance of way building
  - Specify compressor unit to have a maximum sound power level of approximately 81dBA
  - Close shop bay doors during the night time hours
- Specify operations building 2 air conditioning units to have a maximum sound power level of approximately 87dBA
- Include noise specifications for roof top equipment based upon final number, location, and capacities
- Have the vehicles take the most direct route from staging/storage areas to street as possible
- Limit maximum night time hourly deployment to 30 per hour (currently 50 per hour)
- Distribute shunting of LRT vehicles as evenly as possible across site
- Attempt to keep turning radiuses greater than 1000 ft (300 m)
  - Make provisions for rail greasers for curves less than 300 metre radius/radius less than 100 times the truck wheel base
- Operate generators in compliance with NPC300
  - Specify generators to be housed in sound rated enclosures with sound power rating no greater than 90 dBA. To be tested during the daytime hours only.
- Limit LRT vehicle speed to 10 km/hr over onsite cross overs
- Limit LRT vehicle speed to 10 km/hr on site
- Noise barrier along northern property line, 4.5 metres in height
- Noise barrier along property line with school, 7 metres in height
- Noise barrier surrounding transformer, approximately
  - 6 metres in height on north side
  - 9 metres in height on west side facing school

Noise barriers may be reduced through use of building shielding and site layout, and vehicle deployment schedule.

5.2 Vibration

5.2.1.1 Assessment

Vibration from the operation of the Facility will be from the movements of the LRT vehicles. There are two main origins of vibration: the LRT vehicle traversing on continuous rail, and the LRT vehicle traveling over a junction (crossover or frog) between different sets of rails. As the velocity of a LRT vehicle is a contributing factor in the vibration emissions, the following three operational vibration scenarios/sources have been reviewed:

1. General vehicle movements
   - On continuous rail onsite and traveling to the mainline on Finch Avenue West
2. Vehicles traveling over onsite rail junctions
   - General movements over the rail junctions on site at 20 km/h speed limit
3. Vehicles traveling over the rail junction to Finch Avenue West
   - Through-traffic LRT vehicles traversing over the rail junction from the site to the mainline at 60 km/h currently expected near the York Gate and Finch intersection.

Assessment of the in-service vehicles was completed as part of the Etobicoke-Finch West Light Rail Transit Environmental Assessment and is not considered in this assessment.

The review was conducted in two phases. In the first phase, ‘screening distances’ for each vibration scenario/source were calculated to determine which locations would require a more detailed review. For the purposes of this report, a Screening Distance is the distance from a rail segment where the applicable vibration level limit is met. This is dependent on the actual locations of the rail. In the second phase, vibration levels were predicted at the locations identified in the first phase and compared against the vibration limits.

The existing vibration levels (see Table 4) are below vibration limits FTA guide presented in Table 11, and at one location, below the threshold of perception. It would be unreasonable to use a level below the existing vibration levels as the basis of assessment. As such, the vibration criteria from the FTA guide have been adopted as the basis of assessment.

As the layout of the Facility may be subject to change, the vibration sources have been assumed to operate in all reasonable potential worst case locations. For example, the rail junctions on the site were assessed up to the property line. Therefore, the screening distances were measured from the proposed property line.

The ground was assumed to transmit vibration efficiently as the geotechnical reports[16] indicates that the soil conditions are quite variable across the site, and that there are stiff clay type soils up to the surface of the site.

Screening distances for each operational vibration scenario are presented on Figure 7 through Figure 9. Receptors, by type, falling within the screening distances required further detailed review. Detailed calculations for receptors near and within the screening distances, as presented in Figure 7 through Figure 9, have been completed and are summarized in Table 26 to Table 28 below. The tables also note the requirement for further investigation into vibration control. The medical offices at Pelican Gate and Norfinch Drive have been assessed against criteria for both institutional buildings and locations with High Resolution equipment as there is the potential these buildings contain high sensitivity equipment. The Humber Hospital, which falls outside of the screening areas, has both a CT scanner and MRI machine.

Table 26: Detailed Vibration Review – General Vehicle Movements

Receptor	Receptor Type	Background Level [VdB]	Predicted Level [VdB]	Limit [VdB]	Vibration Control Investigation Requirement
Elana Drive at Finch – Residence	Residential	68.5	68.1	72.0	No
Pelican at Finch – Medical Office	Institutional	68.5	60.0	75.0	No
	MRI/High Res			54.0	Yes
Norfinch at Finch – Medical Office	Institutional	68.5	64.0	75.0	No
	MRI/High Res			54.0	Yes
Norfinch at Hydro Corridor– School – Closest Potential Portable	Institutional	66.2	74.6	75.0	No

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[16] *Preliminary Geotechnical Assessment Elderbrook Development Site, Reference number 11-017, Alston Associates Inc., February 23, 2011*

Phase II Environmental Site Assessment – Elderbrook Development Site, SLE Reference: 10336, SNC-Lavalin Environment, March 11, 2011

Report on Preliminary Geotechnical Investigation – Road Widening, Finch Avenue West LRT, Contract TC002, Reference No. GEOTMARK00128AA, Coffey Geotechnics, March 24, 2011

Table 27: Detailed Vibration Review – Onsite Track Crossovers

Receptor	Receptor Type	Background Level [VdB]	Predicted Level [VdB]	Limit [VdB]	Vibration Control Investigation Requirement
Elana Drive at Finch – Residence	Residential	68.5	71.5	72.0	No
Pelican at Finch – Long term Care Facility	Residential	68.5	70.9	72.0	No
Pelican at Finch – Medical Office	Institutional	68.5	70.0	75.0	No
	MRI/High Res			54.0	Yes
Norfinch at Finch – Medical Office	Institutional	68.5	74.0	75.0	No
	MRI/High Res			54.0	Yes
Norfinch at Hydro Corridor– School – Closest Portable Grouping	Institutional	66.2	84.6	75.0	Yes
Norfinch at Hydro Corridor– School – Other Portable Grouping	Institutional	66.2	78.9	75.0	Yes
Norfinch at Hydro Corridor– School – Main Building	Institutional	66.2	60.3	75.0	No

Table 28: Detailed Vibration Review – Rail Connection to Finch

Receptor	Receptor Type	Background Level [VdB]	Predicted Level [VdB]	Limit [VdB]	Vibration Control Investigation Requirement
York Gate Mall	Institutional	62.7	79.7	75.0	Yes
Norfinch Shopping Centre	Institutional	62.7	77.5	75.0	Yes
Elana Drive at Finch – Residence	Residential	68.5	87.6	72.0	Yes
Pelican at Finch – Long term Care Facility	Residential	68.5	81.1	72.0	Yes

5.2.1.2 Design Guidance

Table 26 to Table 28 indicate that vibration control will be required with the positioning of track and track junctions at the closest points to sensitive locations. This section provides preliminary guidance on vibration control to be considered in furthering the Facility design. There are various options in terms of the control of vibration for the movements of the LRT vehicles. Some typical vibration control types, with their associated approximate achievable vibration reductions, are presented in Table 29.

The locations requiring vibration control investigation have been reviewed to determine the reduction required to meet the applicable criteria limits. The required reductions for the closest track-receptor distances are provided in Table 30 to Table 32. Reduction requirements can be decreased with greater separation distances. Also provided in Table 30 to Table 32 are the distances from each receptor where track vibration control is required, herein called VC (Vibration Control) Radius. Track within each VC Radius would require vibration control. Alternatively to installation of vibration control to meet required reduction, track receptor distances can be increased to beyond the VC Radiuses.

Table 29: Approximate Vibration Reduction by Vibration Control Type

Vibration Control Type	Approximate Vibration Reduction Provided [VdB]
Floating Slab Track Bed	15
Ballast Mats	10
High Resilience Fasteners	5
Resiliently Supported Ties	10

Table 30: Vibration Control Requirements – General Vehicle Movements

Receptor	Receptor Type	Predicted Level [VdB]	Limit [VdB]	Vibration Control	
				Reduction Required	VC Radius [m]
Medical Offices – Pelican Gate	MRI/High Res	60.0	54.0	6.0	89
Medical Offices – Norfinch Drive	MRI/High Res	64.0	54.0	10.0	89

Table 31: Vibration Control Requirements – Onsite Track Crossovers

Receptor	Receptor Type	Predicted Level [VdB]	Limit [VdB]	Vibration Control	
				Reduction Required	VC Radius [m]
Medical Offices – Pelican Gate	MRI/High Res	70.0	54.0	16	113
Medical Offices – Norfinch Drive	MRI/High Res	74.0	54.0	20	113
Educational Facility – Norfinch – Closest Portable Grouping	Institutional	84.6	75.0	9.6	32
Educational Facility – Norfinch – Other Portable Grouping	Institutional	78.9	75.0	3.9	32

Table 32: Vibration Control Requirements – Rail Connection to Finch

Receptor	Receptor Type	Predicted Level [VdB]	Limit [VdB]	Vibration Control	
				Reduction Required	VC Radius [m]
York Gate Mall	Institutional	78.7	75.0	4.7	79
Norfinch Shopping Centre	Institutional	77.5	75.0	2.5	79
Residences – Elana Drive	Residential	87.6	72.0	15.6	97
Long Term Care Facility – Pelican Gate	Residential	86.3	72.0	9.1	97

The above tables indicate that, in most cases, the reductions can be achieved with typical vibration control measures, if the locations of the rail and rail track connections are in the worst case locations. Increasing the separation distance between the rail and rail connections and the receptors would decrease the required vibration reduction performance.

However, in some situations, specifically the medical offices being assessed as having high resolution imaging equipment, it would not be possible to achieve the required vibration level reductions, with track located at the property line, with just the installation of typical vibration control measures. A combination of increasing the separation distance from the vibration source to the vibration sensitive receiver, and vibration control installed on the vibration source, would be required. A minimum separation distance of 60 metres from the medical buildings, housing high sensitivity equipment, plus a vibration reduction of 15 VdB for the on-site track crossovers will reduce vibration to acceptable levels.

In addition to the installation of vibration control to achieve the reductions noted in Table 30 to Table 32 above, the following general guidance is provided to aid in the design of the facility:

- Consider the minimum separation distances in Table 30 to Table 32 in the design/layout of the Facility – in some cases, this will remove the requirement for installation of vibration control in certain areas
- Consider placing a lower speed limit for LRT vehicles traveling over track junctions along Finch Avenue West
- Consider conducting force mobility measurements to determine the ability of the ground to transmit vibration – some areas may have localized lower transmission characteristics and may decrease the vibration reduction requirements

6. Operations Assessment – Part 2

With input from all disciplines, a Preferred Design (PD) was developed for this project; it is presented as Figure 10. The noise and vibration assessment has been updated to assess the PD.

6.1 Noise

6.1.1 Assessment

The noise assessment has been updated to reflect the PD. The results of the perceived noise impact and the noise level limit assessments are presented in Table 33 and Table 34. It was assumed that the vehicle deployment will traverse the west side of the site.

Table 33: Perceived Noise Impact

Assessment Locations	Maximum Noise Impact [dB]			Perceived Noise Impact		
	Day	Evening	Night	Day	Evening	Night
Wheatsheaf – Residence 1 (east)	9	9	11	Medium	Medium	High
Wheatsheaf – Residence 2 (west)	4	2	8	Low	Minor	Medium
York Gate at Hullmar – Apartment	3	-	8	Low	-	Medium
York Gate at Hullmar – Residence	3	-	7	Low	-	Medium
Elana Drive at Finch – Residence	-	-	2	-	-	Minor
Pelican at Finch – Long term Care Facility	-	-	3	-	-	Low
Pelican at Finch – Medical Office	-	-	2	-	-	Minor
Norfinch at Finch – Medical Office	3	3	7	Low	Low	Medium
Norfinch at Hydro Corridor– School	19	17	-	High	High	-

Table 34: Operational Noise Level Limit Assessment

Assessment Locations	Predicted Noise Level [dBA]			Criteria			Meet Criteria		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
Wheatsheaf – Residence 1 (east)	65	65	65	50	50	45	No	No	No
Wheatsheaf – Residence 2 (west)	61	61	62	50	51	45	No	No	No
York Gate at Hullmar – Apartment	62	62	63	54	58	50	No	No	No
York Gate at Hullmar – Residence	62	62	62	54	58	50	No	No	No
Elana Drive at Finch – Residence	67	67	68	67	68	63	Yes	Yes	No
Pelican at Finch – Long term Care Facility	69	69	69	67	68	63	No	No	No
Pelican at Finch – Medical Office	68	68	68	67	68	63	No	Yes	No
Norfinch at Finch – Medical Office	72	72	73	67	68	63	No	No	No
Norfinch at Hydro Corridor– School	76	76	-	50	51	-	No	No	-

The above results indicate that in the majority of cases, there is a minor to a medium perceived noise impact with a few cases having a high noise impact. The results also indicate that the Facility will not meet MOECC noise level limits in most cases without the implementation of noise control.

The following noise sources are predicted to require noise control:

- Crossovers
- Generators
- Wheel truing
- Transformer
- Some large bay doors
- Brake testing
- Some vehicle movements
- Some roof top equipment
- Compressors

Noise mitigation is discussed in the following section.

6.1.2 Noise Mitigation (Operations)

For the Facility's operations to meet NPC-300, noise control will be required. Noise mitigation for the Facility, based upon the PD, to meet NPC-300 is provided below:

- Main Maintenance shop / Main Repair Shop
  - Close bay doors while wheel truing
  - Specify shop compressors to have a maximum environmental sound power level of 90 dBA
  - West facing doors
    - Close bay doors during night time hours unless being used for the transiting vehicles, possible use of an automated quick close system
    - Open to a maximum of ¼ of the way during all other hours unless being used for the transiting vehicles, possible use of an automated quick close system
  - East facing doors
    - open at most 1/2 way during the night time hours unless being used for the transiting vehicles, possible use of an automated quick close system
- Maintenance of way building
  - Specify compressor to have a maximum environmental sound power level of 90 dBA
  - Bay doors during loud operations such as using impact wrenches or hammering sheet metal
    - Close during night time hours

        - Close half way and operate no more than 30 minutes out of any given hour during the daytime
- Specify operations building 2 main AC units to maximum sound power level of 102 dBA
- Include noise specifications for roof top equipment based upon final number, location, and capacities
- Generators tested during daytime only, specified maximum sound power level of about 98 dBA
- Attempt to keep turning radiuses greater than 1000 ft (300 m)
    - Make provisions for rail greasers for curves less than 300 metre radius/radius less than 100 times the truck wheel base
- Change maximum hourly deployment from 20/hr day, 20/hr evening, 50/hr night, to:
    - 20/hr day
    - 20/hr evening
    - 30/hr night – this is for the morning deployment (currently forecasted at 50 in a single hour) to 50 over the course of an hour and forty minutes (1 every 2 minutes)
- LRT vehicle speed on site limited to 10km/hr
- Distribute shunting of LRT vehicles as evenly as possible across site
- Noise barriers as presented on Figure 11

The above mitigation is preliminary in nature and is required to be further developed during detail design to account for potential design updates such as:

- Refined equipment locations, performance, number, and specifications
- Refined building design
- Refined LRT deployment schedule
- Final speed of LRT vehicles over track connection with Finch Avenue
- Advanced engineering solution – Optimized noise reducing frog/crossover design, e.g. flange bearing frog

The perceived noise impact of the Facility meeting NPC-300 (including noise mitigation) is presented in Table 35.

Table 35: Perceived Noise Impact – Guideline Compliance

Assessment Locations	Meeting Guideline Criteria			Background Level			Perceived Noise Impact		
	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
Wheatsheaf – Residence 1 (east)	50	50	45	56	56	54	-	-	-
Wheatsheaf – Residence 2 (west)	50	51	45	57	59	54	-	-	-
York Gate at Hullmar – Apartment	54	58	50	59	63	55	-	-	-
York Gate at Hullmar – Residence	54	58	50	59	63	55	-	-	-
Elana Drive at Finch – Residence	67	68	63	69	69	66	-	-	-
Pelican at Finch – Long term Care Facility	67	68	63	69	69	66	-	-	-
Pelican at Finch – Medical Office	67	68	63	69	69	66	-	-	-
Norfinch at Finch – Medical Office	67	68	63	69	69	66	-	-	-
Norfinch at Hydro Corridor– School	50	51	-	57	59	-	-	-	-

The Facility will be required to submit an ECA application to the MOECC showing that the built Facility meets the requirements of MOECC document NPC-300.

An operational noise management plan is required to be prepared to address noise control for the operation of the Finch West LRT MSF. The operational noise management plan is required to:

- Demonstrate that the facility meets Ministry of Environment and Climate Change (MOECC) noise guideline NPC-300
- Demonstrate that the Facility meets municipal (Toronto) noise by-law requirements
- Detail plan to submit an Environmental Compliance Approval (ECA) application to the Ministry of the Environment and Climate Change
- Detail noise control measures being implemented at the facility
- Detail measurement/verification plan to confirm performance of the noise mitigation measures

6.2 Vibration

6.2.1 Assessment

The vibration assessment has been revised to reflect the PD. As the separation distances between receptors and vibration sources have increased, only receptors identified in Section 5.2.1.1 as requiring vibration control investigation have been reassessed. Revised vibration predictions and requirements for vibration control investigation are presented in Table 36 to Table 38. Similar to the Part 1 assessment, three scenarios/sources were assessed:

1. General vehicle movements
    - On continuous rail onsite and traveling to the mainline on Finch Avenue West
2. Vehicles traveling over onsite rail junctions
    - General movements over the rail junctions on site at 20 km/h speed limit
3. Vehicles traveling over the rail junction to Finch Avenue West
    - Through-traffic LRT vehicles traversing over the rail junction from the site to the mainline at 60 km/h currently expected near the York Gate and Finch intersection.

Table 36: Detailed Vibration Review – General Vehicle Movements

Receptor	Receptor Type	Background Level [VdB]	Predicted Level [VdB]	Limit [VdB]	Vibration Control Investigation Requirement
Pelican at Finch – Medical Office	MRI/High Res	68.5	53.2	54.0	No
Norfinch at Finch – Medical Office	MRI/High Res	68.5	56.6	54.0	Yes

Table 37: Detailed Vibration Review – Onsite Track Crossovers

Receptor	Receptor Type	Background Level [VdB]	Predicted Level [VdB]	Limit [VdB]	Vibration Control Investigation Requirement
Pelican at Finch – Medical Office	MRI/High Res	68.5	63.2	54.0	Yes
Norfinch at Finch – Medical Office	MRI/High Res	68.5	65.8	54.0	Yes
Norfinch at Hydro Corridor– School – Closest Portable Grouping	Institutional	66.2	72.5	75.0	No
Norfinch at Hydro Corridor– School – Other Portable Grouping	Institutional	66.2	67.1	75.0	No

Table 38: Detailed Vibration Review – Rail Connection to Finch

Receptor	Receptor Type	Background Level [VdB]	Predicted Level [VdB]	Limit [VdB]	Vibration Control Investigation Requirement
York Gate Mall	Institutional	62.7	84.6	75.0	Yes
Norfinch Shopping Centre	Institutional	62.7	78.1	75.0	Yes
Elana Drive at Finch – Residence	Residential	68.5	87.0	72.0	Yes
Pelican at Finch – Long term Care Facility	Residential	68.5	81.6	72.0	Yes

The results indicate that some vibration control investigation is required. Vibration mitigation is discussed in the section below.

6.2.2 Vibration Mitigation (Operations)

Similar to Section 5.2.1.2, locations requiring vibration mitigation investigation have been reviewed to determine the reduction required meet the applicable criteria limits. This section provides preliminary analysis of vibration control requirements based upon the PD.

The preliminary vibration reductions for the closest track-receptor distances are provided in Table 39 to Table 41. Vibration reduction requirements can be reduced with greater separation distances. Also provided in Table 39 to Table 41 are the distances from each receptor where track vibration control is required, herein called VC (Vibration Control) Radius. Track within each VC Radius would require vibration control. Alternatively to installation of vibration control to meet required reduction, track receptor distances can be increased to beyond the VC Radiuses.

Table 39: Vibration Control Requirements – General Vehicle Movements

Receptor	Receptor Type	Predicted Level [VdB]	Limit [VdB]	Vibration Control	
				Reduction Required	VC Radius [m]
Medical Offices – Norfinch Drive	MRI/High Res	56.6	54.0	2.6	89

Table 40: Vibration Control Requirements – Onsite Track Crossovers

Receptor	Receptor Type	Predicted Level [VdB]	Limit [VdB]	Vibration Control	
				Reduction Required	VC Radius [m]
Medical Offices – Pelican Gate	MRI/High Res	63.2	54.0	9.2	113
Medical Offices – Norfinch Drive	MRI/High Res	65.8	54.0	11.8	113

Table 41: Vibration Control Requirements – Rail Connection to Finch

Receptor	Receptor Type	Predicted Level [VdB]	Limit [VdB]	Vibration Control	
				Reduction Required	VC Radius [m]
York Gate Mall	Institutional	84.6	75.0	9.6	78
Norfinch Shopping Centre	Institutional	78.1	75.0	3.1	78
Residences – Elana Drive	Residential	87	72.0	15	97
Long Term Care Facility – Pelican Gate	Residential	81.6	72.0	9.6	97

The above results indicate that the vibration reductions required can be achieved using typical vibration control types which are presented in Table 42. Vibration mitigation based upon the PD is summarized below:

- Track connections to the Finch Line at York Gate Boulevard and Finch Avenue West. Up to 15 VdB of reduction is required.
- Onsite track crossovers within 113 metres of the medical buildings at Finch Avenue West at Norfinch Drive and Pelican Gate. Up to 12 VdB of attenuation at the closest track crossover is required in the current configuration. The further the track crossover, the lower performance is required up to 113 metres distance. Approximately 11 crossovers have been identified at this time.
- Track within 89 metres of the medical buildings at Finch Avenue West at Norfinch Drive and Pelican Gate. Up to 3 VdB of attenuation at the closest onsite track is required in the current site configuration. Rough estimate of 200 metres of track requires vibration control.

The above mitigation is based upon the typical performance of typical vibration control types for rail and is presented on Figure 12. Alternatives providing the minimum required reductions can also be acceptable. Vibration control requirements, including transition zones, and performance are to be reviewed during detail design.

The following may decrease vibration reduction requirements and should be reviewed during detail design:

- Consider placing a lower speed limit for LRT vehicles traveling over track junctions along Finch Avenue West (currently modeled as posted speed limit of 60 km/hr)
- Consider conducting force mobility measurements to determine the ability of the ground to transmit vibration – some areas may have localized lower transmission characteristics and may decrease the vibration reduction requirements

Table 42: Approximate Vibration Reduction by Vibration Control Type

Vibration Control Type	Approximate Vibration Reduction Provided [VdB]
Floating Slab Track Bed	15
Ballast Mats	10
High Resilience Fasteners	5
Resiliently Supported Ties	10

An operational vibration management plan is required to be prepared to address the vibration impacts due to the operation of the Finch West LRT MSF. The vibration management plan is required to:

- Detail plan to incorporate vibration assessment into ECA application
- Demonstrate that design will meet FTA vibration criteria

- Detail vibration mitigation measures being implemented
- Detail how performance and level limits at sensitive receptors will be verified/measured

7. Operations Assessment – Part 3

Noise from vehicles within the public right of way is assessed separately from vehicles located within the project property line. Noise from the Finch West LRT line was previously reviewed as part of the environmental assessment for the transit line. The results of the Finch West LRT Line assessment, in the area surrounding the Finch West LRT MSF, needs to be updated to reflect the addition of an access to the Finch West LRT MSF. The Romfield Lane Point of Assessment from the Finch West LRT Line EA is the most representative of the residential locations in the vicinity of the Finch West LRT MSF access. The results for Romfield Lane point of assessment are presented in Table 43 below.

Table 43: Results for the Romfield Lane Point of Assessment – Finch West LRT Line

Time Period	Noise Level – Finch West LRT Line [dBA]
16 hour day	69.2
8 hour night	65.7

The dominant noise sources associated with the access to the Finch West LRT MSF include new track junctions and wheel squeal from the turns. The noise prediction algorithm used in the assessment of the Finch West LRT Line (STAMSON) is unable to predict noise from track junctions and wheel squeal. Therefore noise source information (for the track junctions and wheel squeal) was input into an environmental noise prediction algorithm (ISO 9613-2 implemented in Cadna/A software package) to predict noise levels at the residences along Finch Avenue West. The predicted noise levels from the track junctions and wheel squeal were added (energy addition) to the predicted noise levels from the Finch West LRT Line and compared against the applicable criteria. The results are presented in Table 44.

Table 44: Assessment Results – Finch West LRT MSF Access

Time Period	Noise Level – Facility Access Only [dBA]	Resultant Noise Level – Access and Line [dBA]	Criteria[17] [dBA]	Exceedance [dB]	Mitigation Required?
16 hour day	70.7	73.0	69.4	3.6	No
8 hour night	69.2	70.8	66.6	4.2	No

The above results indicate that no noise mitigation is required to address the offsite access to the Finch West LRT MSF.

8. Noise and Vibration Monitoring

Construction noise and vibration has the potential to negatively affect the adjacent sensitive land uses, even with the guidance provided above. As such, noise and vibration monitoring is required to confirm that noise and vibration levels meet acceptable levels. As noted in Section 4.1.2, guidance for setting noise level limits is available in ISO R1996 and the FTA guide. Construction noise levels less than 5 dB above the pre-construction background are typically acceptable. Vibration level guidance is also provided in the FTA guide. A construction noise and vibration monitoring plan will be developed during detail design.

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[17] *See Section 3.1 and Table 9*

Vibration mitigation is required for the operations of the Facility. To determine if the vibration mitigation is performing sufficiently, post construction, operational vibration monitoring is required to determine if the operational vibration levels are met at the vibration sensitive receptors. Force mobility measurements may be conducted to refine the vibration transmission capability characteristic of the ground between the site and the vibration sensitive locations. This may reduce the required vibration mitigation performance.

As discussed above, noise mitigation is required to address the operational noise levels from the proposed Facility. To optimize the noise mitigation design, pre-construction noise monitoring, representative of the noise sensitive receptors surrounding the proposed Facility, is recommended to refine the noise level limits used for the assessment of the Facility.

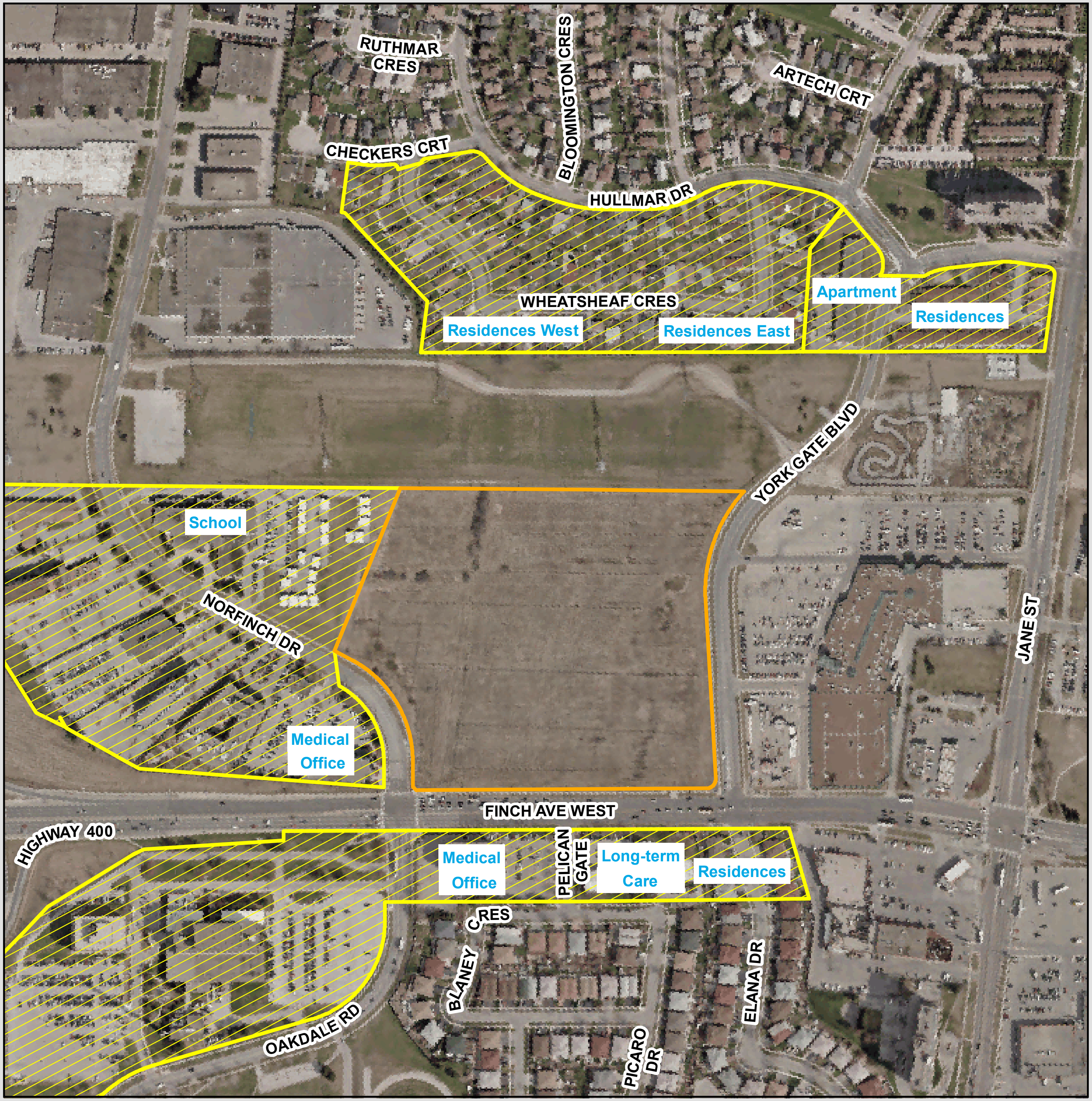
9. Conclusions

As part of the Finch West LRT line, a maintenance and storage facility (the Facility) has been proposed to service the LRT vehicles. Four Alternative Designs have been reviewed to produce input for the development of the Preferred Design. Analysis indicates that noise and vibration mitigation measures will be required for the Facility to operate within compliance with the applicable vibration and MOECC noise guidelines. Preliminary noise and vibration mitigation, subject to further development in detailed design, are described in Sections 6.1.2 and 6.2.2. Plans detailing the operational noise and vibration mitigation measures being implemented at the Facility are required during detail design. With noise mitigation designed for the Facility to operate in compliance with NPC-300, the Facility will have a negligible noise impact.

Construction noise and vibration have also been reviewed as part of this assessment. The review has indicated that negative effects on the surrounding sensitive receivers are likely. Guidance to minimize the construction noise and vibration impacts is provided in Sections 4.1.2 and 4.2.2. Specific mitigation requirements are described 4.1.3 and 4.2.3.

With the noise and vibration control implemented, the temporary noise and vibration during construction would be minimized, and the operational noise and vibration will be able to meet applicable guideline limits.

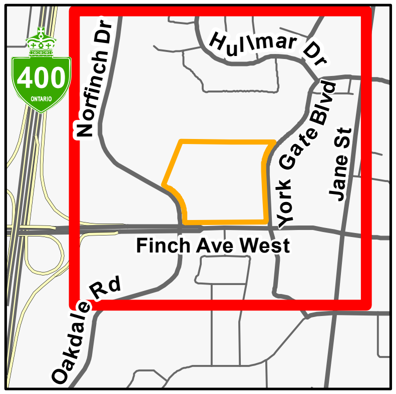
Figures



Legend

▨ Noise and Vibration Sensitive Areas

☐ Property Limits for the Proposed MSF Site



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Finch West Light Rail
Maintenance and Storage Facility (MSF)
Environmental Assessment

Noise and Vibration Sensitive Areas

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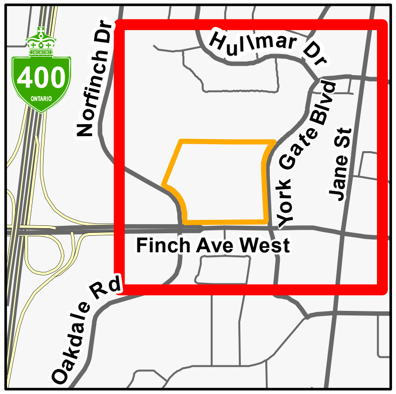
Figure 1

Legend

Ⓦ Monitoring Location

▭ Property Limits - Approximate



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Finch West MSF

Noise and Vibration Monitoring Locations

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Figure 2

Legend

- Property Limits for the Proposed MSF Site
- H Hospital / Medical Facilities
- School
- ■ LRV Entrance/Egress
- ▨ Non-LRV Entrance/Egress
- — LRV Track
- **Group 1 - Buildings**
- ▨ Main Repair Shop Facility
- ▨ Maintenance of Way Building
- ▨ Operations Company Building
- ▨ Electrical Substation
- **Group 2 - Ancillary Facility Features**
- **Group 3 - Major Track Crossovers**
- **Group 4 - LRV Storage Track Area**

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Finch West Light Rail
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Environmental Assessment

MSF Alternative Design Scenario 1

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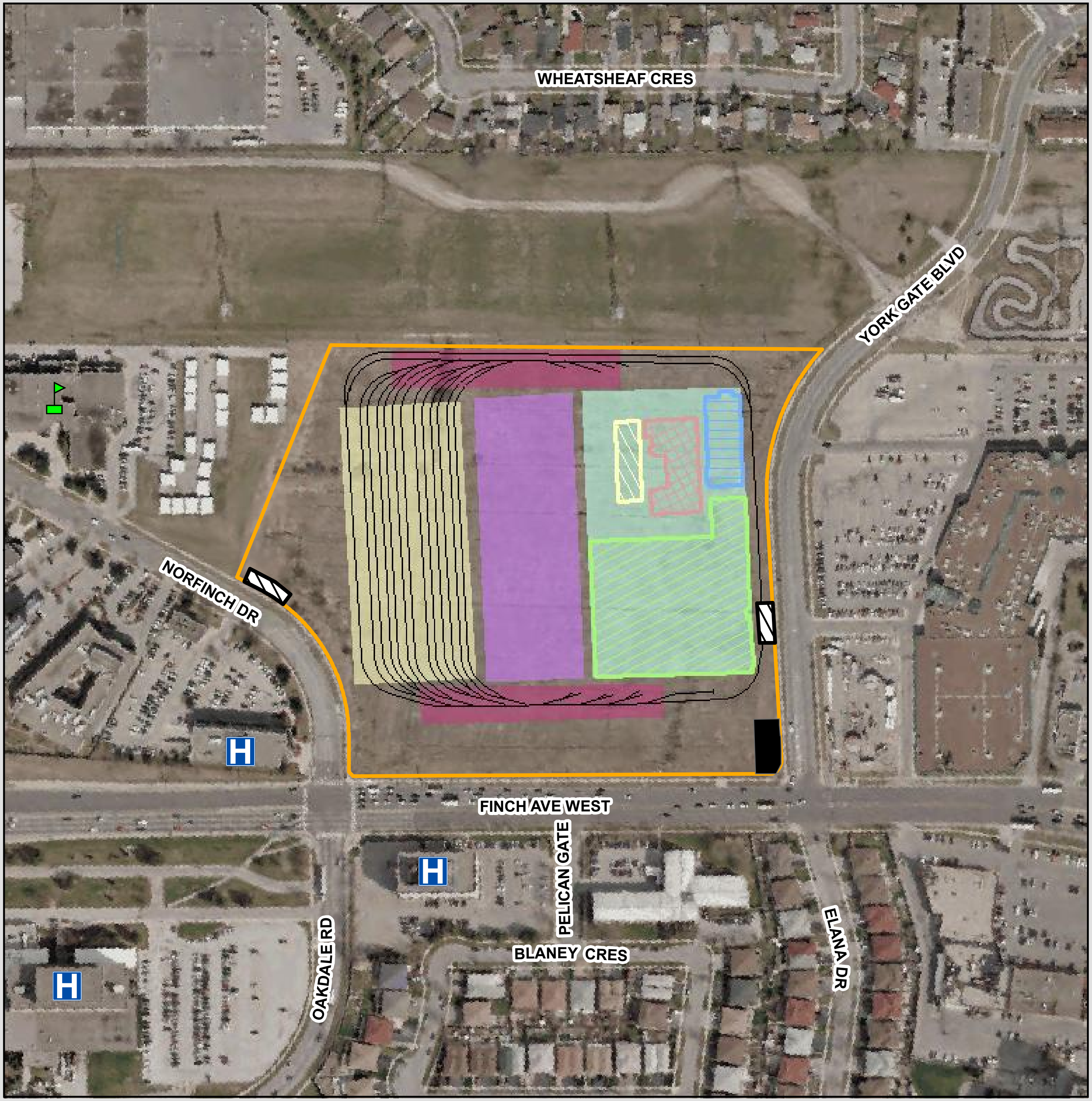
Figure 3



Legend

- ▭ Property Limits for the Proposed MSF Site
- H Hospital / Medical Facilities
- ⚑ School
- ■ LRV Entrance/Egress
- ▨ Non-LRV Entrance/Egress
- — LRV Track
- 🟦 **Group 1 - Buildings**
- ▨ Main Repair Shop Facility
- ▨ Maintenance of Way Building
- ▨ Operations Company Building
- ▨ Electrical Substation
- 🟪 **Group 2 - Ancillary Facility Features**
- 🟥 **Group 3 - Major Track Crossovers**
- 🟨 **Group 4 - LRV Storage Track Area**

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Finch West Light Rail
Maintenance and Storage Facility (MSF)
Environmental Assessment

MSF Alternative Design Scenario 2

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Figure 4

Legend

▭ Property Limits for the Proposed MSF Site

H Hospital / Medical Facilities

⚑ School

■ LRV Entrance/Egress

▨ Non-LRV Entrance/Egress

— LRV Track

■ **Group 1 - Buildings**

▨ Main Repair Shop Facility

▨ Maintenance of Way Building

▨ Operations Company Building

▨ Electrical Substation

■ **Group 2 - Ancillary Facility Features**

■ **Group 3 - Major Track Crossovers**

■ **Group 4 - LRV Storage Track Area**

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Finch West Light Rail
Maintenance and Storage Facility (MSF)
Environmental Assessment

MSF Alternative Design Scenario 3

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Figure 5

Legend

- ▭ Property Limits for the Proposed MSF Site
- H Hospital / Medical Facilities
- ⚑ School
- ■ LRV Entrance/Egress
- ▨ Non-LRV Entrance/Egress
- — LRV Track
- ■ **Group 1 - Buildings**
- ▨ Main Repair Shop Facility
- ▨ Maintenance of Way Building
- ▨ Operations Company Building
- ▨ Electrical Substation
- ■ **Group 2 - Ancillary Facility Features**
- ■ **Group 3 - Major Track Crossovers**
- ■ **Group 4 - LRV Storage Track Area**

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Finch West Light Rail
Maintenance and Storage Facility (MSF)
Environmental Assessment

MSF Alternative Design Scenario 4

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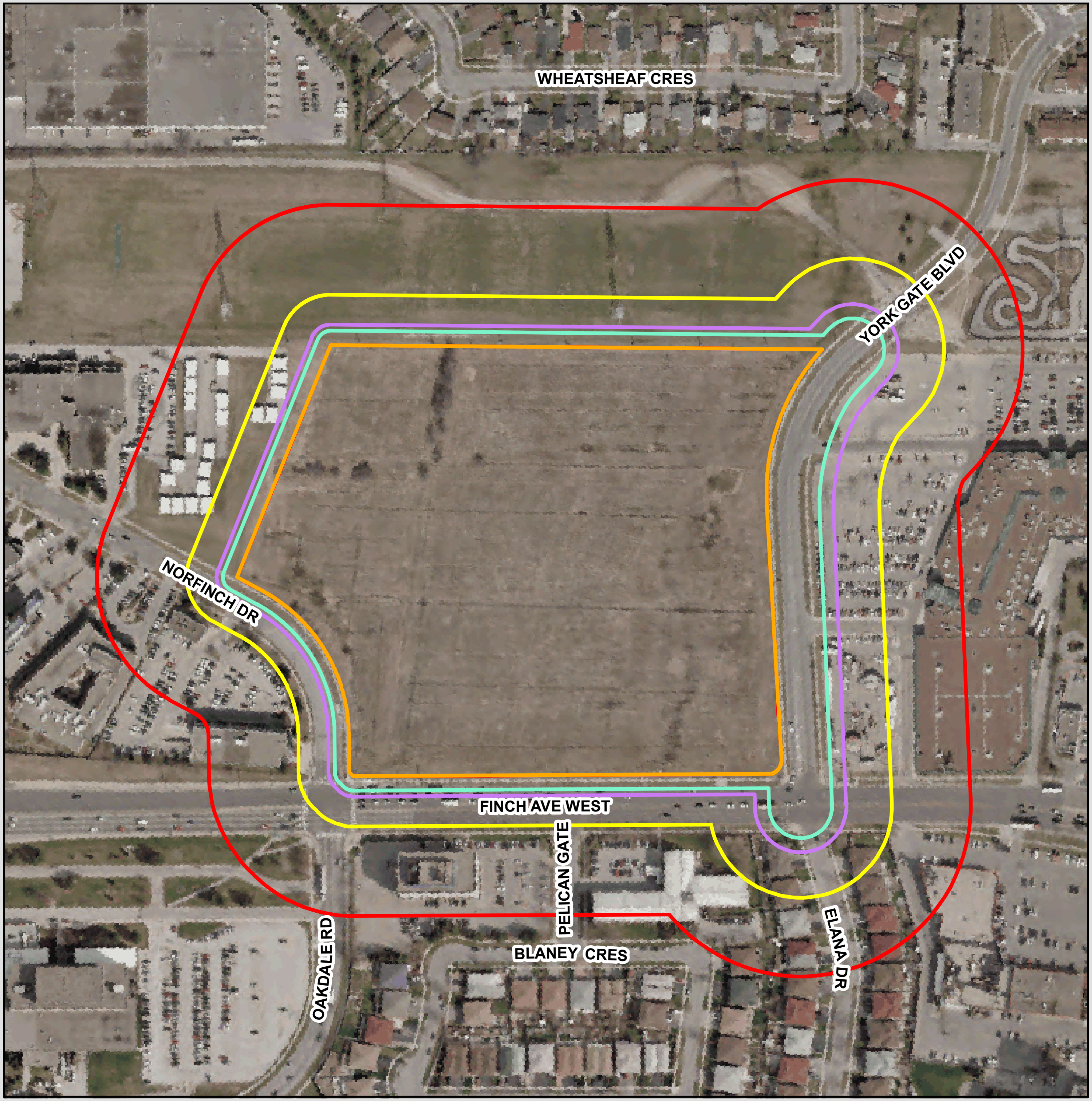
Figure 6



Legend

🟧 Property Limits for the Proposed MSF Site

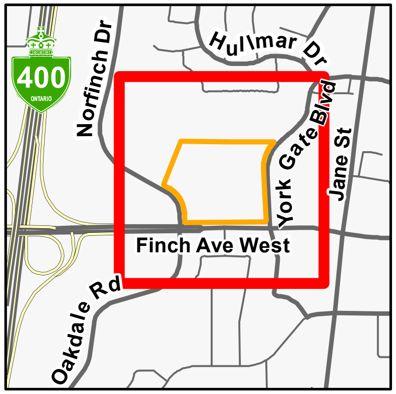
Vibration Screening Distances

▭ Institutional

▭ Residential Night and Operating Rooms)

🟨 Threshold of Perception

🟥 General Limit 1 Micro Detail Equipment and MRI



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Finch West Light Rail
Maintenance and Storage Facility (MSF)
Environmental Assessment

Vibration Screening Distance from General Movements

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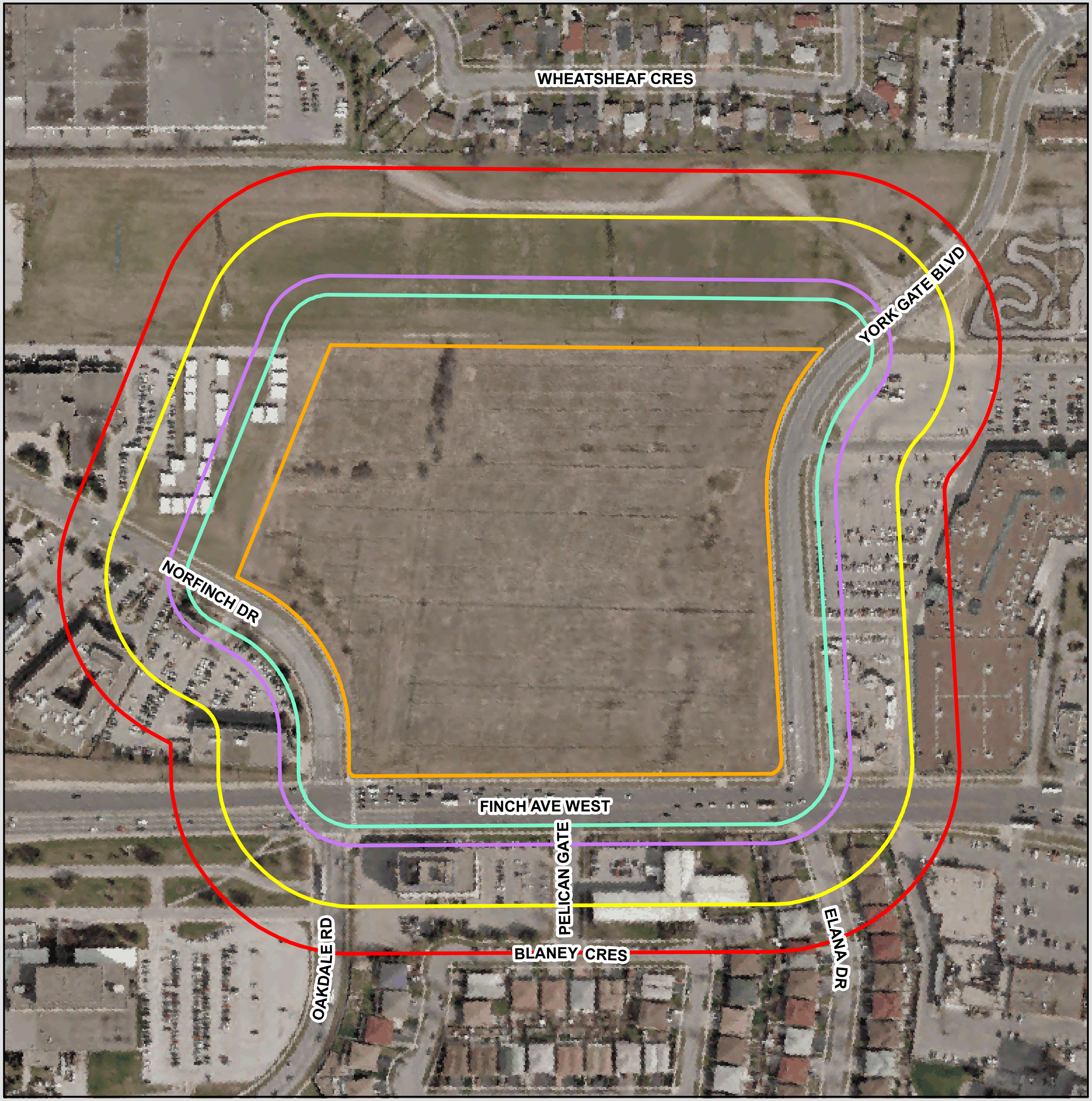
AECOM

Figure 7



Legend

🟧 Property Limits for the Proposed MSF Site

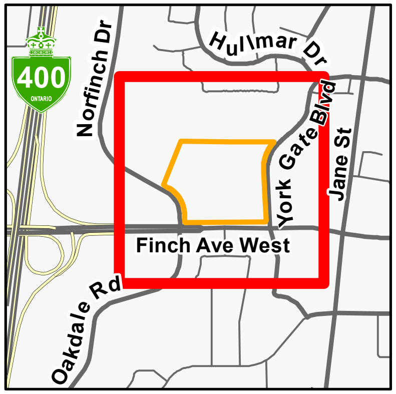
Vibration Screening Distances

🟩 Institutional

🟪 Residential Night and Operating Rooms

🟨 Threshold of Perception

🟥 General Limit 1 Micro Detail Equipment and MRI



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1:3,500
MTM 3Degree, NAD 27

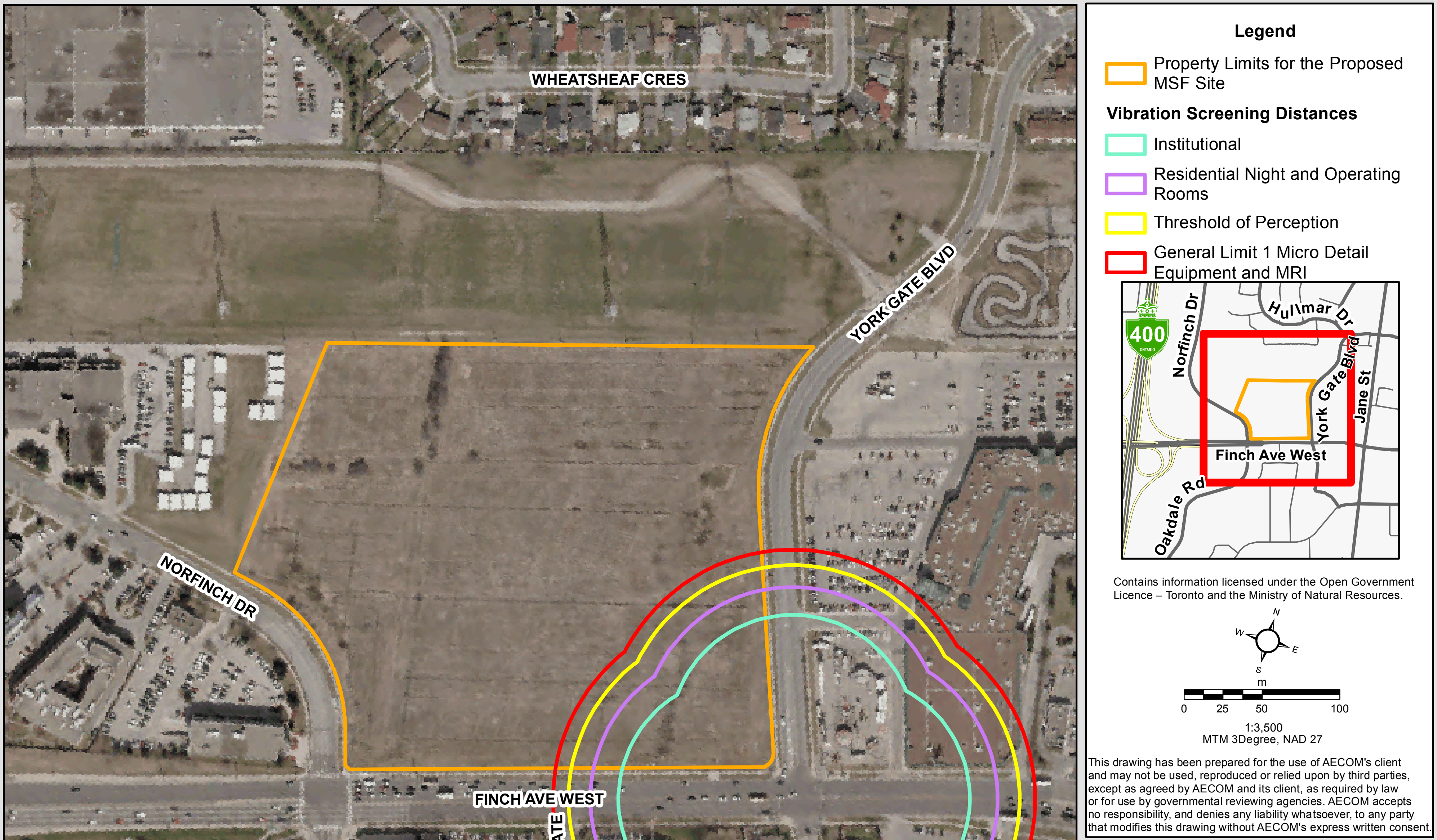
Finch West Light Rail
Maintenance and Storage Facility (MSF)
Environmental Assessment

Vibration Screening Distance for Onsite Track Crossovers

July 2015

AECOM

Figure 8



Legend

🟧 Property Limits for the Proposed MSF Site

Vibration Screening Distances

🟩 Institutional

🟪 Residential Night and Operating Rooms

🟨 Threshold of Perception

🟥 General Limit 1 Micro Detail Equipment and MRI

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1:3,500
MTM 3Degree, NAD 27

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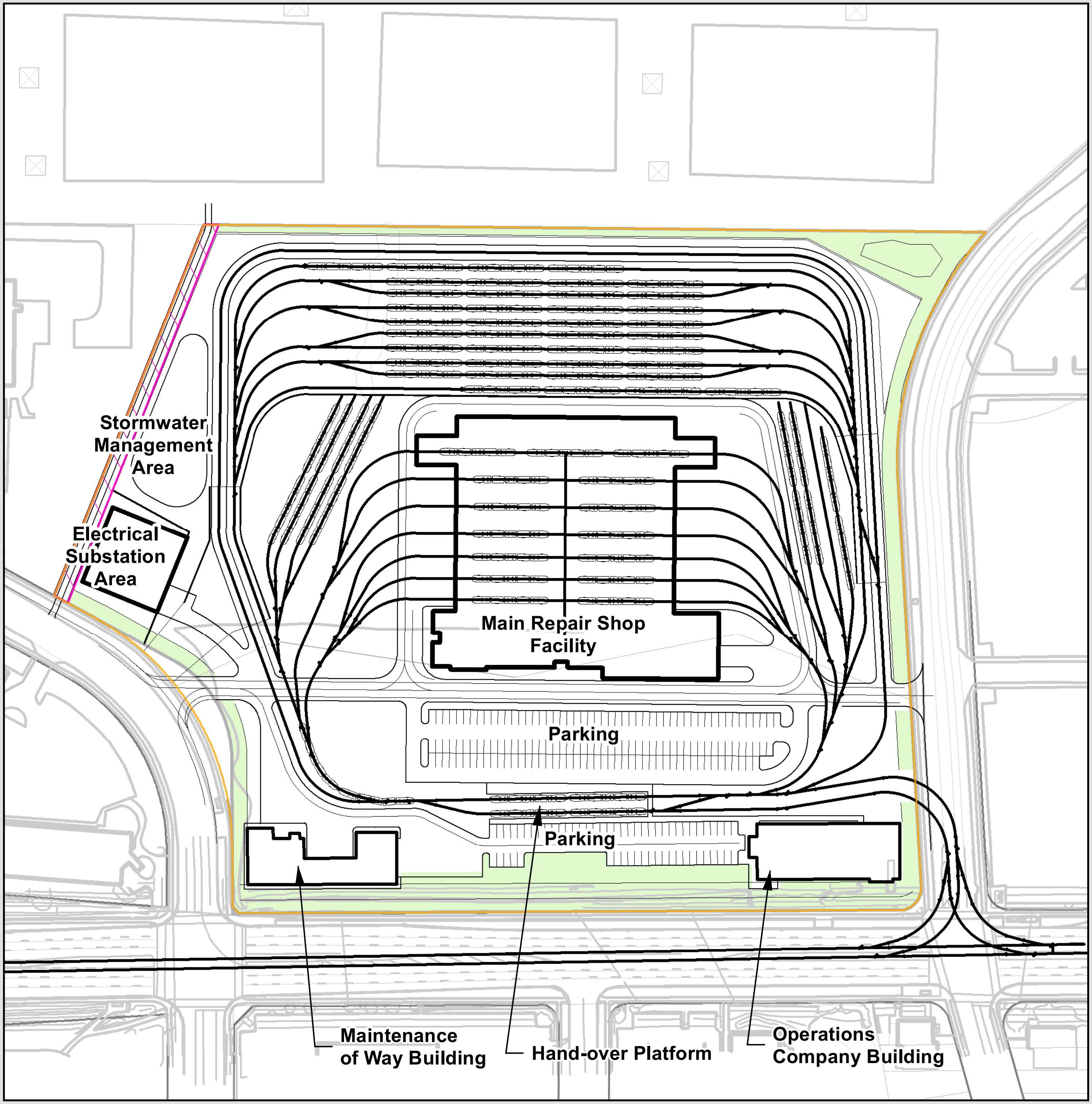
Finch West Light Rail
Maintenance and Storage Facility (MSF)
Environmental Assessment

Vibration Screening Distance for Finch Mainline Connection

July 2015

AECOM

Figure 9



Legend

▭ Property Limits for the MSF Site

▬ Light Rail Vehicle (LRV)

— LRV Track

▨ Bicycle Path

🟩 Landscape Buffer

N
W
E
S

m

0 25 50

1:2,200
MTM 3Degree, NAD 27

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Finch West Light Rail
Maintenance and Storage Facility (MSF)
Environmental Assessment

MSF Preferred Design

July 2015

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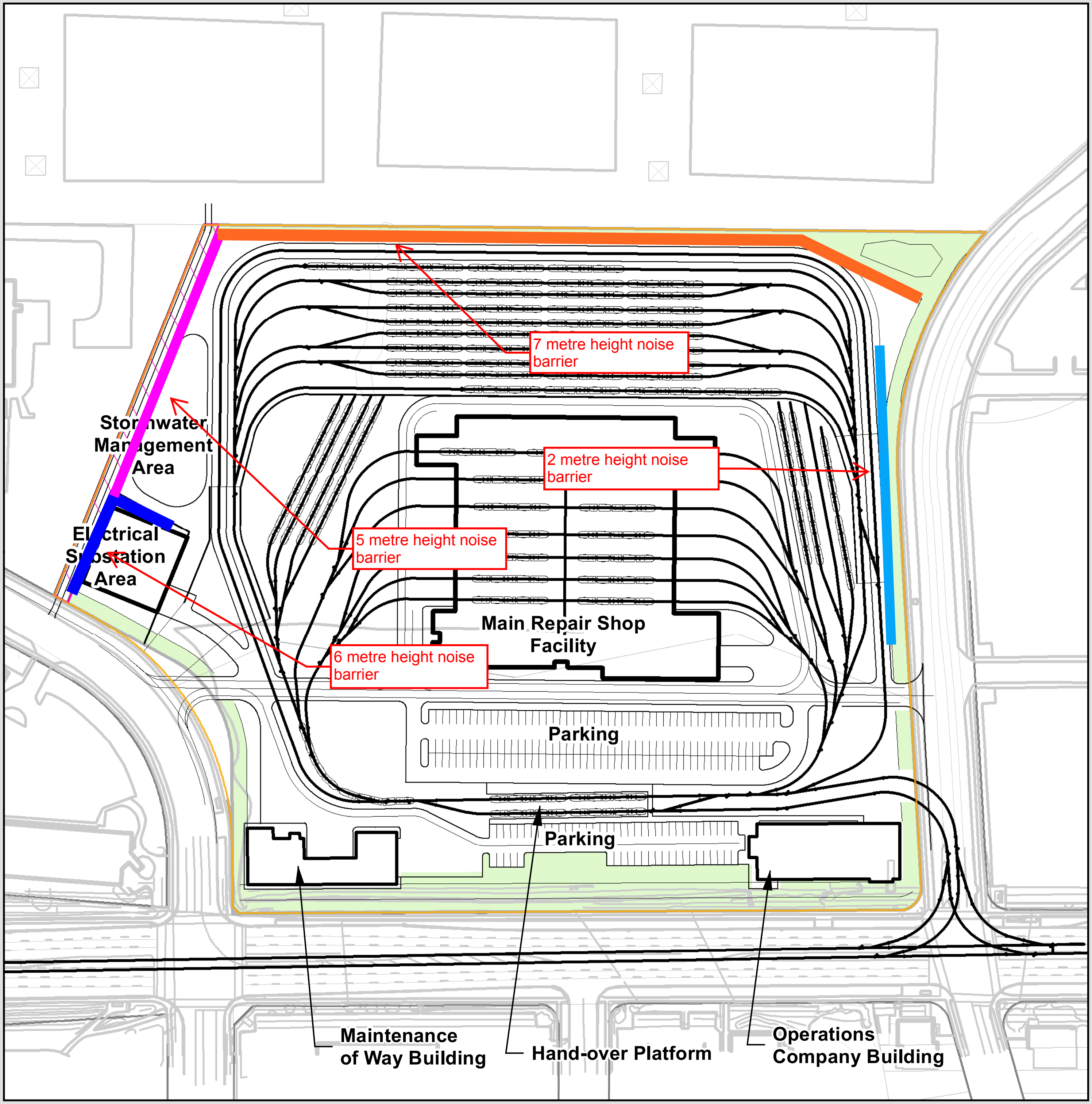
Figure 10



Legend

- ▭ Property Limits for the MSF Site
- ━ Light Rail Vehicle (LRV)
- ── LRV Track
- ▨ Bicycle Path
- 🟩 Landscape Buffer

N W E S

m

0 25 50

1:2,200
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Finch West Light Rail
Maintenance and Storage Facility (MSF)
Environmental Assessment

Preferred Design Noise Barriers

July 2015

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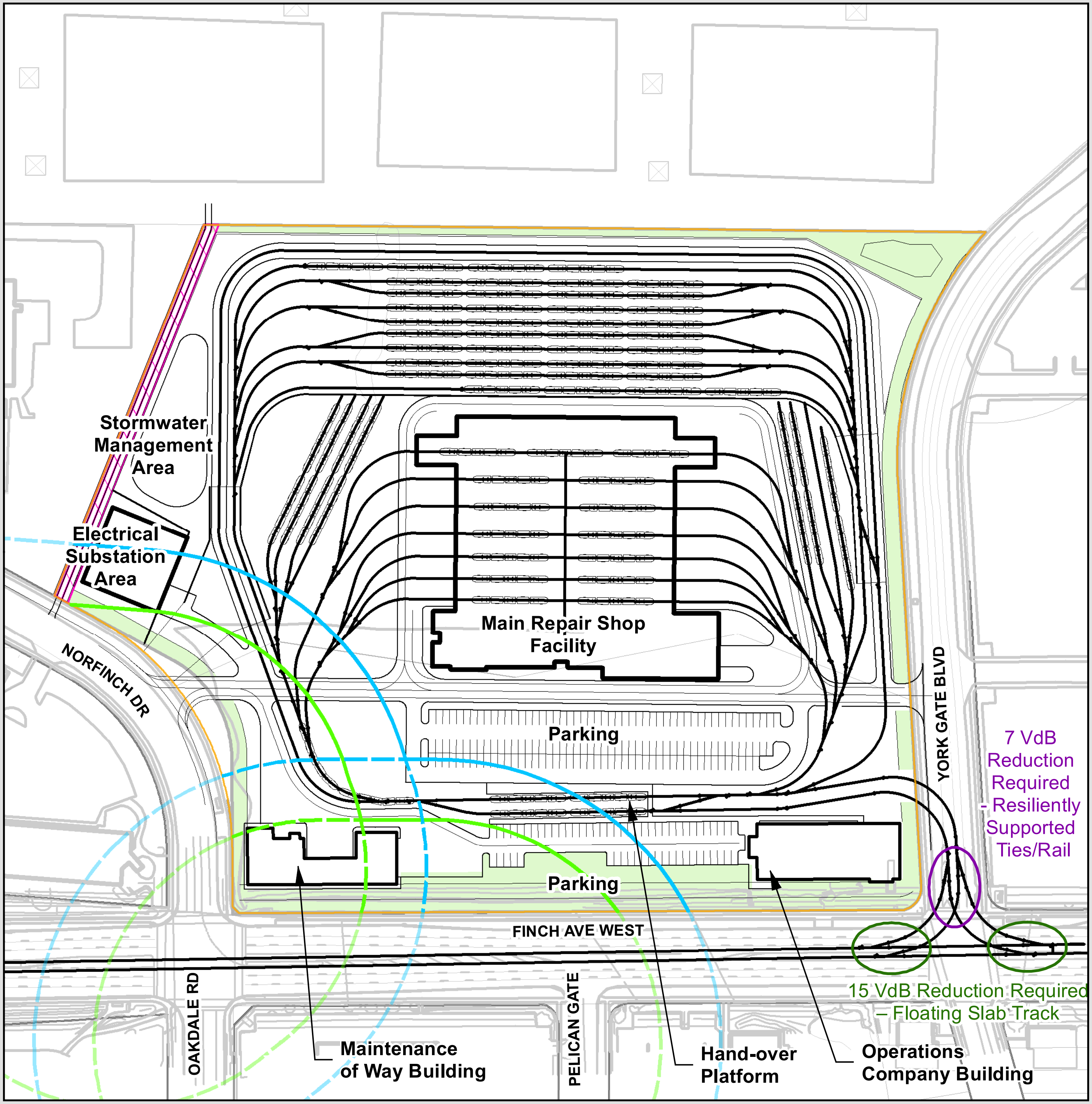
Figure 11



Legend

▭	Property Limits for the MSF Site
─▭▭▭─	Light Rail Vehicle (LRV)
──	LRV Track
──	Vibration Control Radius for On-Site Track Crossovers
──	Vibration Control Radius for On-Site Track
▨	Bicycle Path
🟩	Landscape Buffer

N
W E
S

m
0 25 50

1:2,200
MTM 3Degree, NAD 27

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Finch West Light Rail
Maintenance and Storage Facility (MSF)
Environmental Assessment

Vibration Control for the Preferred Design

July 2015

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Figure 12

Appendices

Appendix A

Appendix A: Noise Monitoring Data

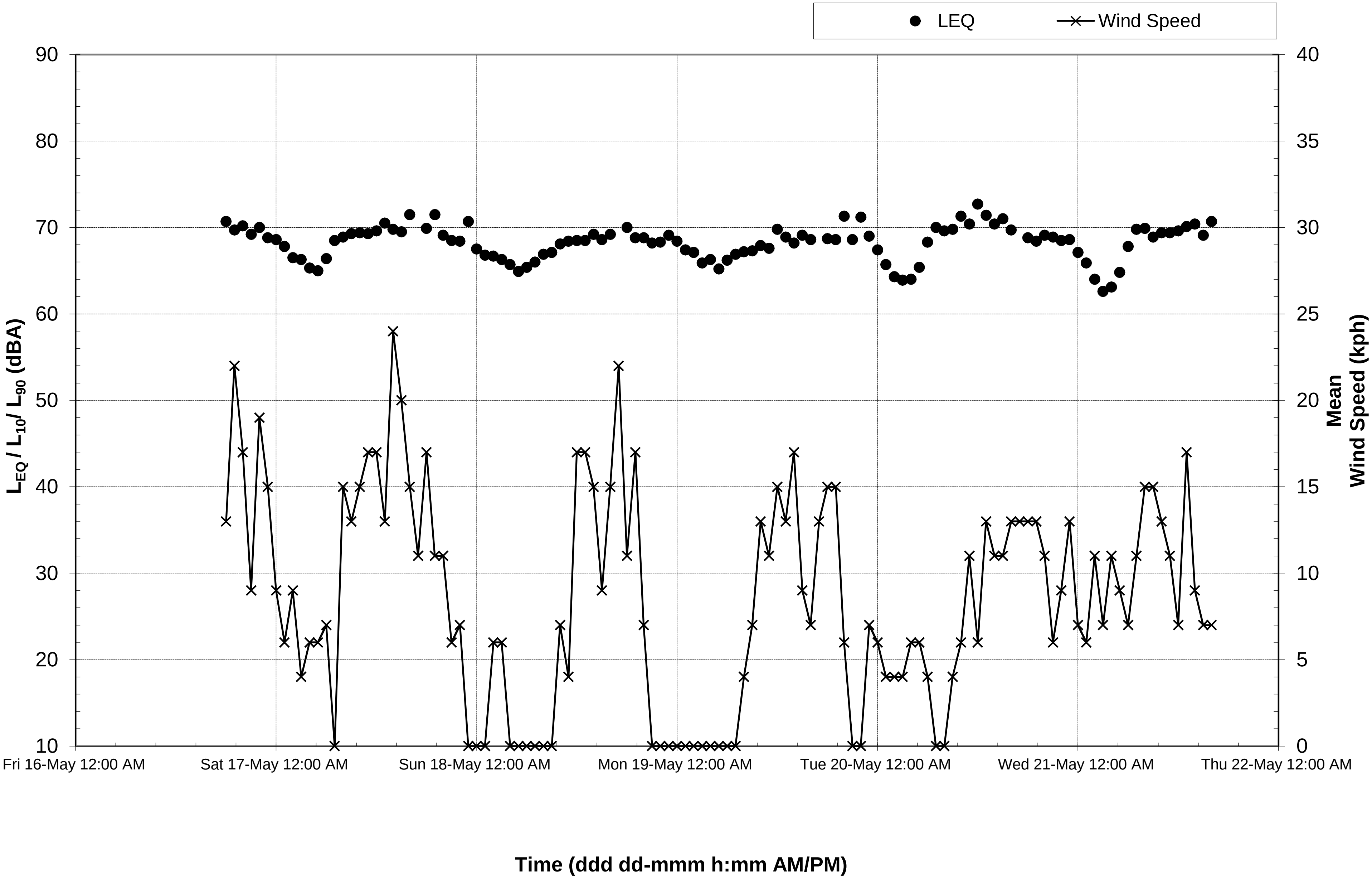
Location: ***Loc1*** **Project:** ***TTC Finch LRT***
PN: ***60318592***

Daily Statistics	#	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Date	Fri 16-May-14	Fri 16-May-14	Sat 17-May-14	Sat 17-May-14	Sat 17-May-14	Sun 18-May-14	Sun 18-May-14	Sun 18-May-14	Mon 19-May-14	Mon 19-May-14	Mon 19-May-14	Tue 20-May-14	Tue 20-May-14	Tue 20-May-14	Wed 21-May-14	Wed 21-May-14
	Time Period	Day-time	Evening	Night-time	Day-time	Evening	Night-time	Day-time	Evening	Night-time	Day-time	Evening	Night-time	Day-time	Evening	Night-time	Day-time
L_{EQ} (dBA)	Minimum Value	-	68.8	65.0	68.9	68.4	64.9	66.9	68.2	65.2	67.2	68.6	63.9	68.4	68.5	62.6	68.9
	Maximum Value	-	70.0	68.6	71.5	70.7	67.5	68.8	69.1	68.4	69.8	71.3	70.0	72.7	69.1	69.8	70.4
	Mean Value	-	69.3	66.8	69.9	69.2	66.2	68.0	68.6	66.7	68.4	70.0	66.1	70.3	68.8	65.6	69.6
	Standard Deviation	-	0.6	1.4	1.0	1.1	0.8	0.8	0.4	1.0	0.8	1.4	2.2	1.4	0.3	2.5	0.5
	Number of Samples	0.0	3.0	8.0	8.0	4.0	8.0	6.0	4.0	8.0	11.0	4.0	8.0	8.0	4.0	8.0	8.0
	95% Confidence Interval	-	0.7	0.9	0.7	1.0	0.6	0.6	0.4	0.7	0.5	1.4	1.5	1.0	0.3	1.7	0.4

Period Statistics		**All Valid Data**					**All Valid Weekday Data**					**All Valid Weekend Data**			
	Time Period	Day-time	Evening	Night	ALL	Time Period	Day-time	Evening	Night	ALL	Time Period	Day-time	Evening	Night	ALL
L_{EQ} (dBA)	Minimum Value	66.9	68.2	62.6	62.6	Minimum Value	67.2	68.5	62.6	62.6	Minimum Value	66.9	68.2	64.9	64.9
	Maximum Value	72.7	71.3	70.0	72.7	Maximum Value	72.7	71.3	70.0	72.7	Maximum Value	71.5	70.7	68.6	71.5
	Mean Value	69.2	69.2	66.3	68.0	Mean Value	69.3	69.4	66.1	68.1	Mean Value	69.1	68.9	66.5	67.9
	Standard Deviation	1.3	0.9	1.7	2.0	Standard Deviation	1.3	1.0	2.0	2.2	Standard Deviation	1.3	0.8	1.1	1.7
	Number of Samples	41.0	19.0	40.0	100.0	Number of Samples	27.0	11.0	24.0	62.0	Number of Samples	14.0	8.0	16.0	38.0
	95% Confidence Interval	0.4	0.4	0.5	0.4	95% Confidence Interval	0.5	0.6	0.8	0.5	95% Confidence Interval	0.7	0.6	0.6	0.5

Note that poor weather conditions invalidated the data for the periods with blank summaries

Loc1 - Noise Monitoring Results



Location: ***Loc2***

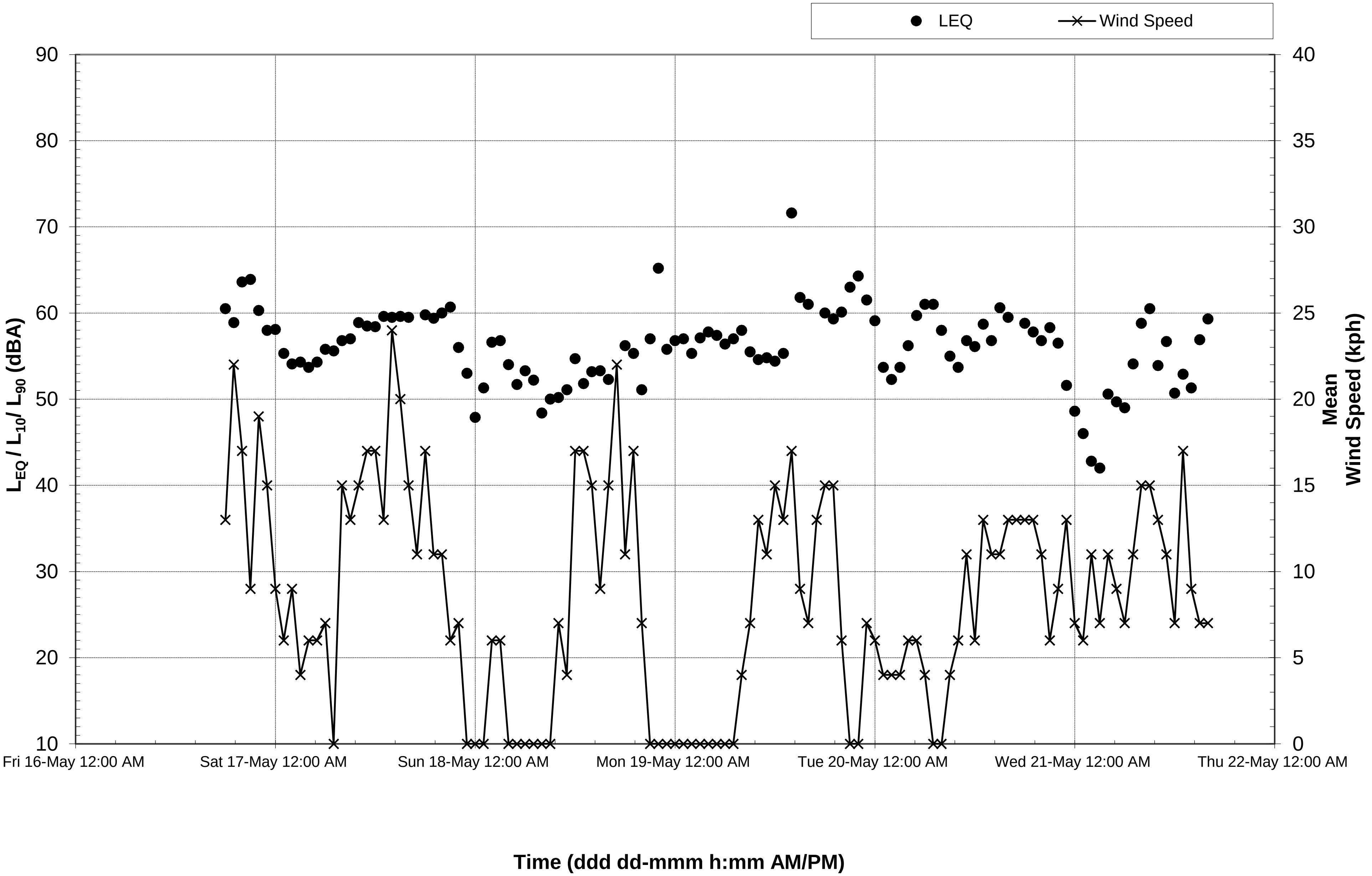
Project: ***TTC Finch LRT***
PN: ***60318592***

Daily Statistics	#	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Date	Fri 16-May-14	Fri 16-May-14	Sat 17-May-14	Sat 17-May-14	Sat 17-May-14	Sun 18-May-14	Sun 18-May-14	Sun 18-May-14	Mon 19-May-14	Mon 19-May-14	Mon 19-May-14	Tue 20-May-14	Tue 20-May-14	Tue 20-May-14	Wed 21-May-14	Wed 21-May-14
	Time Period	Day-time	Evening	Night-time	Day-time	Evening	Night-time	Day-time	Evening	Night-time	Day-time	Evening	Night-time	Day-time	Evening	Night-time	Day-time
L_{EQ} (dBA)	Minimum Value	-	58.0	53.7	56.8	53.0	47.9	48.4	51.1	55.3	54.4	60.1	52.3	53.7	51.6	42.0	50.7
	Maximum Value	-	63.9	58.1	59.8	60.7	56.8	55.3	65.2	57.8	71.6	64.3	61.0	58.8	58.3	54.1	60.5
	Mean Value	-	60.7	55.2	58.5	57.4	53.0	51.6	57.3	56.9	58.8	62.2	57.1	56.9	55.8	47.9	55.2
	Standard Deviation	-	3.0	1.4	1.1	3.6	2.9	2.8	5.9	0.7	5.1	1.8	3.5	1.8	2.9	4.1	3.6
	Number of Samples	0.0	3.0	8.0	8.0	4.0	8.0	6.0	4.0	8.0	11.0	4.0	8.0	8.0	4.0	8.0	8.0
	95% Confidence Interval	-	3.4	1.0	0.8	3.5	2.0	2.2	5.7	0.5	3.0	1.8	2.5	1.3	2.9	2.8	2.5

Period Statistics		**All Valid Data**					**All Valid Weekday Data**					**All Valid Weekend Data**			
	Time Period	Day-time	Evening	Night	ALL	Time Period	Day-time	Evening	Night	ALL	Time Period	Day-time	Evening	Night	ALL
L_{EQ} (dBA)	Minimum Value	48.4	51.1	42.0	42.0	Minimum Value	50.7	51.6	42.0	42.0	Minimum Value	48.4	51.1	47.9	47.9
	Maximum Value	71.6	65.2	61.0	71.6	Maximum Value	71.6	64.3	61.0	71.6	Maximum Value	59.8	65.2	58.1	65.2
	Mean Value	56.6	58.6	54.0	55.9	Mean Value	57.1	59.5	53.9	56.3	Mean Value	55.6	57.4	54.1	55.3
	Standard Deviation	4.1	4.1	4.4	4.5	Standard Deviation	4.1	3.8	5.3	4.9	Standard Deviation	4.0	4.5	2.5	3.7
	Number of Samples	41.0	19.0	40.0	100.0	Number of Samples	27.0	11.0	24.0	62.0	Number of Samples	14.0	8.0	16.0	38.0
	95% Confidence Interval	1.2	1.9	1.4	0.9	95% Confidence Interval	1.5	2.2	2.1	1.2	95% Confidence Interval	2.1	3.1	1.2	1.2

Note that poor weather conditions invalidated the data for the periods with blank summaries

LOC2 - Noise Monitoring Results



Location: ***Loc3***

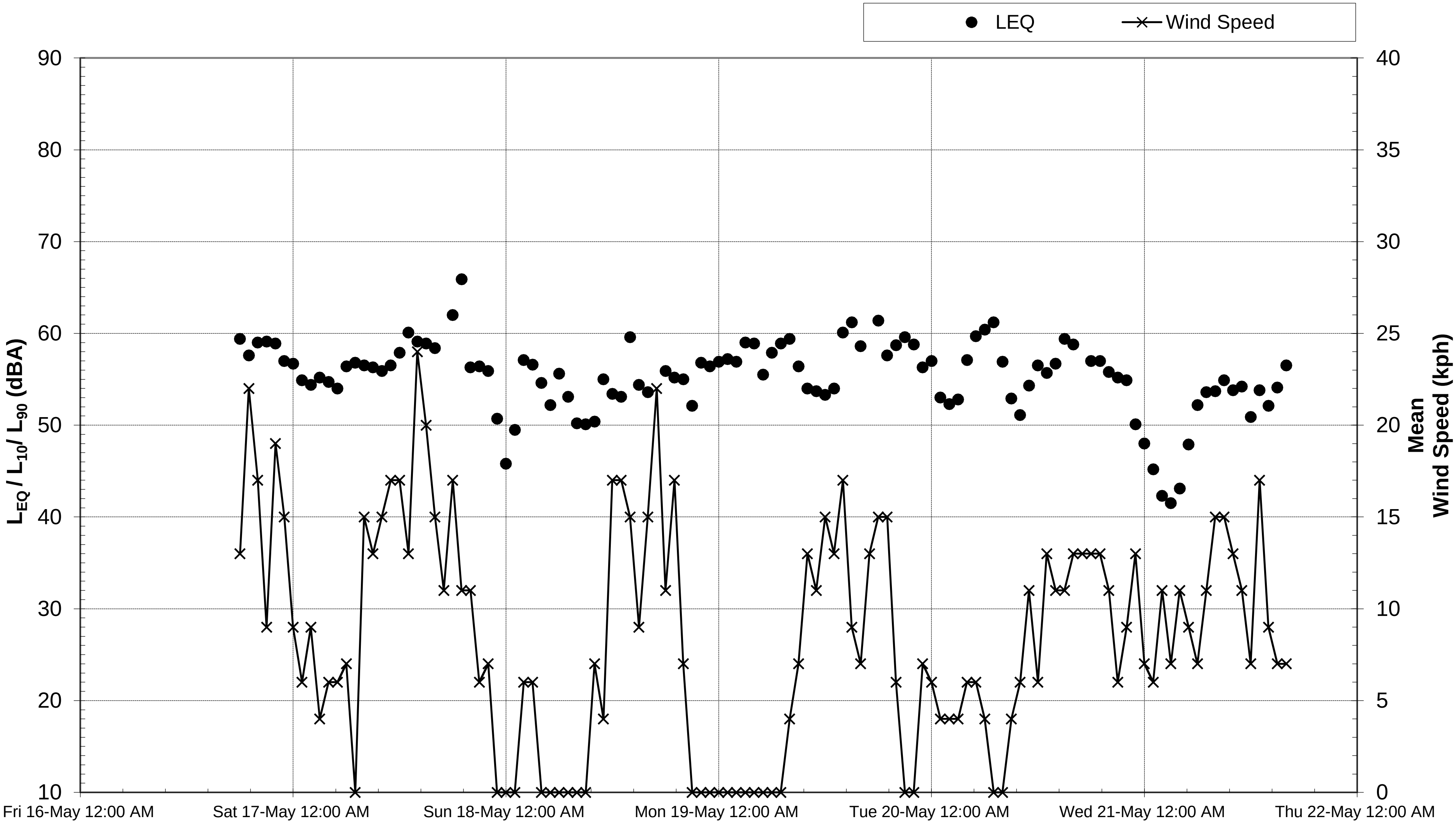
Project: ***TTC Finch LRT***
PN: ***60318592***

Daily Statistics	#	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Date	Fri 16-May-14	Fri 16-May-14	Sat 17-May-14	Sat 17-May-14	Sat 17-May-14	Sun 18-May-14	Sun 18-May-14	Sun 18-May-14	Mon 19-May-14	Mon 19-May-14	Mon 19-May-14	Tue 20-May-14	Tue 20-May-14	Tue 20-May-14	Wed 21-May-14	Wed 21-May-14
	Time Period	Day-time	Evening	Night-time	Day-time	Evening	Night-time	Day-time	Evening	Night-time	Day-time	Evening	Night-time	Day-time	Evening	Night-time	Day-time
L_{EQ} (dBA)	Minimum Value	-	57.0	54.0	55.9	50.7	45.8	50.1	52.1	55.5	53.3	56.3	52.3	51.1	50.1	41.5	50.9
	Maximum Value	-	59.1	56.8	65.9	56.4	57.1	55.2	56.8	59.0	61.4	59.6	61.2	57.0	55.8	53.6	54.9
	Mean Value	-	58.3	55.4	58.7	54.8	53.1	52.4	55.1	57.7	57.2	58.4	56.7	55.2	54.0	46.7	53.4
	Standard Deviation	-	1.2	1.1	3.5	2.8	3.9	2.4	2.1	1.3	3.1	1.4	3.6	2.2	2.6	4.5	1.3
	Number of Samples	0.0	3.0	8.0	8.0	4.0	8.0	6.0	4.0	8.0	11.0	4.0	8.0	8.0	4.0	8.0	8.0
	95% Confidence Interval	-	1.3	0.8	2.4	2.7	2.7	2.0	2.1	0.9	1.8	1.4	2.5	1.5	2.6	3.1	0.9

Period Statistics	**All Valid Data**					**All Valid Weekday Data**					**All Valid Weekend Data**				
	Time Period	Day-time	Evening	Night	ALL	Time Period	Day-time	Evening	Night	ALL	Time Period	Day-time	Evening	Night	ALL
L_{EQ} (dBA)	Minimum Value	50.1	50.1	41.5	41.5	Minimum Value	50.9	50.1	41.5	41.5	Minimum Value	50.1	50.7	45.8	45.8
	Maximum Value	65.9	59.6	61.2	65.9	Maximum Value	61.4	59.6	61.2	61.4	Maximum Value	65.9	56.8	57.1	65.9
	Mean Value	55.7	56.0	53.9	55.0	Mean Value	55.5	56.8	53.7	55.0	Mean Value	56.0	55.0	54.2	55.0
	Standard Deviation	3.4	2.7	5.0	4.1	Standard Deviation	2.9	2.8	6.0	4.4	Standard Deviation	4.4	2.3	3.0	3.5
	Number of Samples	41.0	19.0	40.0	100.0	Number of Samples	27.0	11.0	24.0	62.0	Number of Samples	14.0	8.0	16.0	38.0
	95% Confidence Interval	1.0	1.2	1.5	0.8	95% Confidence Interval	1.1	1.6	2.4	1.1	95% Confidence Interval	2.3	1.6	1.5	1.1

Note that poor weather conditions invalidated the data for the periods with blank summaries

Loc3 - Noise Monitoring Results



Time (ddd dd-mmm h:mm AM/PM)

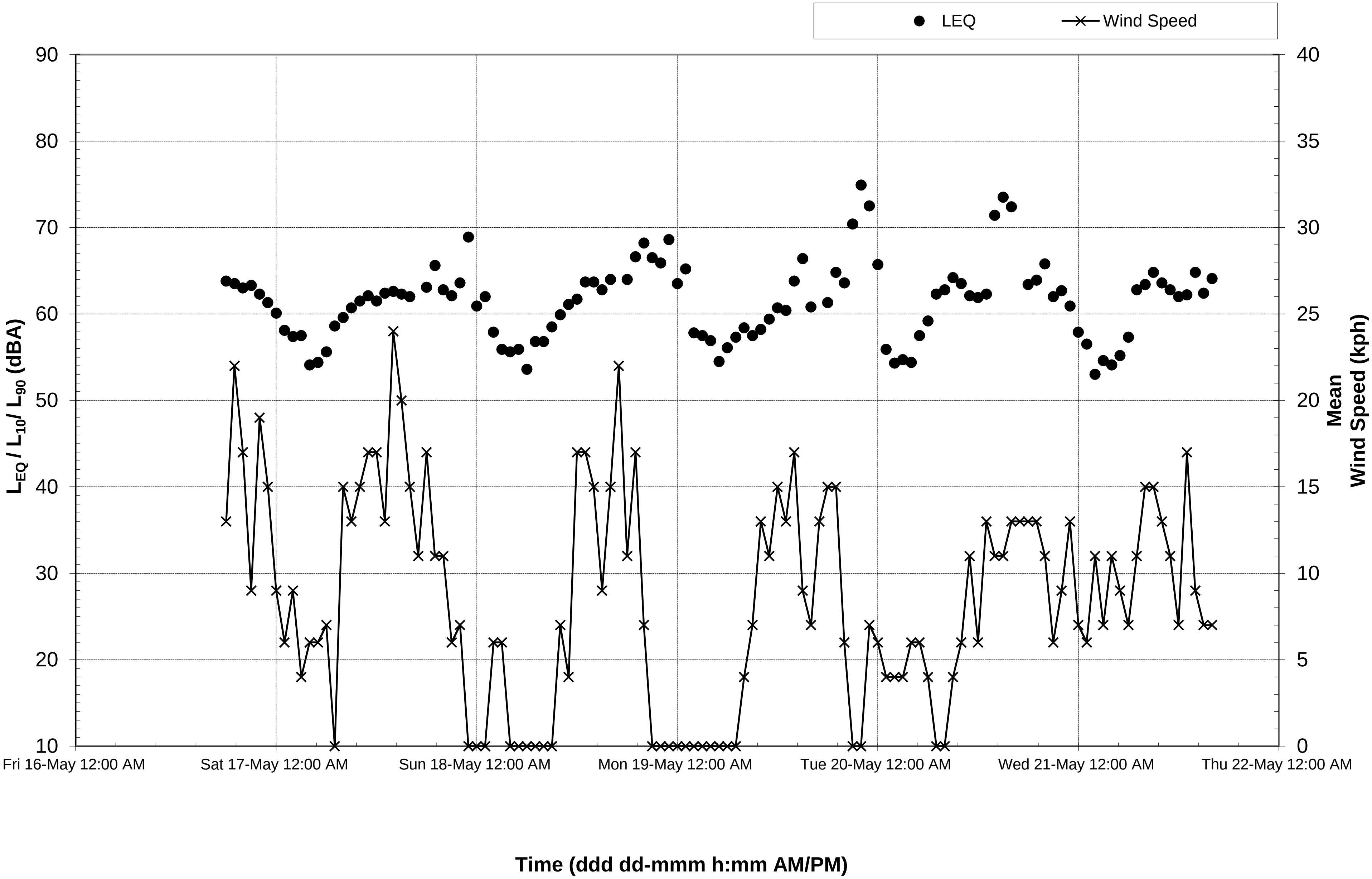
Location: ***Loc4*** **Project:** ***TTC Finch LRT***
PN: ***60318592***

Daily Statistics	#	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Date	Fri 16-May-14	Fri 16-May-14	Sat 17-May-14	Sat 17-May-14	Sat 17-May-14	Sun 18-May-14	Sun 18-May-14	Sun 18-May-14	Mon 19-May-14	Mon 19-May-14	Mon 19-May-14	Tue 20-May-14	Tue 20-May-14	Tue 20-May-14	Wed 21-May-14	Wed 21-May-14
	Time Period	Day-time	Evening	Night-time	Day-time	Evening	Night-time	Day-time	Evening	Night-time	Day-time	Evening	Night-time	Day-time	Evening	Night-time	Day-time
L_{EQ} (dBA)	Minimum Value	-	61.3	54.1	59.6	62.1	53.6	56.8	65.9	54.5	57.5	63.6	54.3	61.9	60.9	53.0	62.0
	Maximum Value	-	63.3	60.1	65.6	68.9	62.0	66.6	68.6	65.2	66.4	74.9	65.7	64.2	65.8	62.8	64.8
	Mean Value	-	62.3	57.0	62.0	64.4	57.3	60.8	67.3	58.6	61.1	70.4	58.0	63.0	62.9	56.4	63.3
	Standard Deviation	-	1.0	2.1	1.8	3.1	2.8	3.4	1.3	3.7	2.9	4.9	4.2	0.9	2.1	3.1	1.1
	Number of Samples	0.0	3.0	8.0	8.0	4.0	8.0	6.0	4.0	8.0	11.0	4.0	8.0	8.0	4.0	8.0	8.0
	95% Confidence Interval	-	1.1	1.5	1.2	3.0	2.0	2.7	1.3	2.6	1.7	4.8	2.9	0.6	2.1	2.1	0.8

Period Statistics		**All Valid Data**					**All Valid Weekday Data**					**All Valid Weekend Data**			
	Time Period	Day-time	Evening	Night	ALL	Time Period	Day-time	Evening	Night	ALL	Time Period	Day-time	Evening	Night	ALL
L_{EQ} (dBA)	Minimum Value	56.8	60.9	53.0	53.0	Minimum Value	57.5	60.9	53.0	53.0	Minimum Value	56.8	62.1	53.6	53.6
	Maximum Value	66.6	74.9	65.7	74.9	Maximum Value	66.4	74.9	65.7	74.9	Maximum Value	66.6	68.9	62.0	68.9
	Mean Value	62.0	65.6	57.5	60.9	Mean Value	62.3	65.4	57.7	61.1	Mean Value	61.5	65.8	57.2	60.6
	Standard Deviation	2.3	4.0	3.2	4.3	Standard Deviation	2.2	4.9	3.6	4.4	Standard Deviation	2.5	2.7	2.4	4.2
	Number of Samples	41.0	19.0	40.0	100.0	Number of Samples	27.0	11.0	24.0	62.0	Number of Samples	14.0	8.0	16.0	38.0
	95% Confidence Interval	0.7	1.8	1.0	0.8	95% Confidence Interval	0.8	2.9	1.5	1.1	95% Confidence Interval	1.3	1.9	1.2	1.3

Note that poor weather conditions invalidated the data for the periods with blank summaries

Loc4 - Noise Monitoring Results

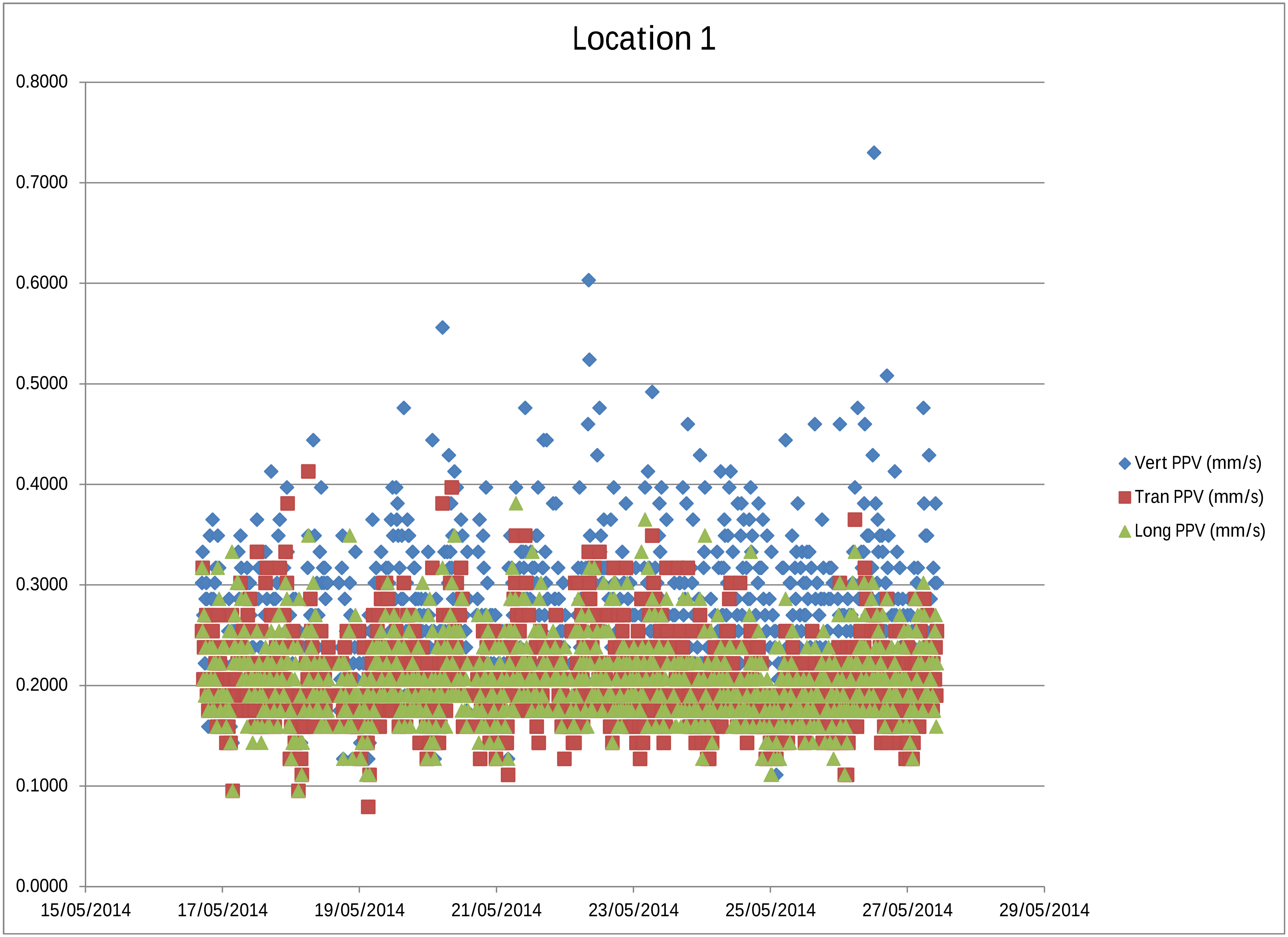


Appendix B

Appendix B: Vibration Monitoring Data

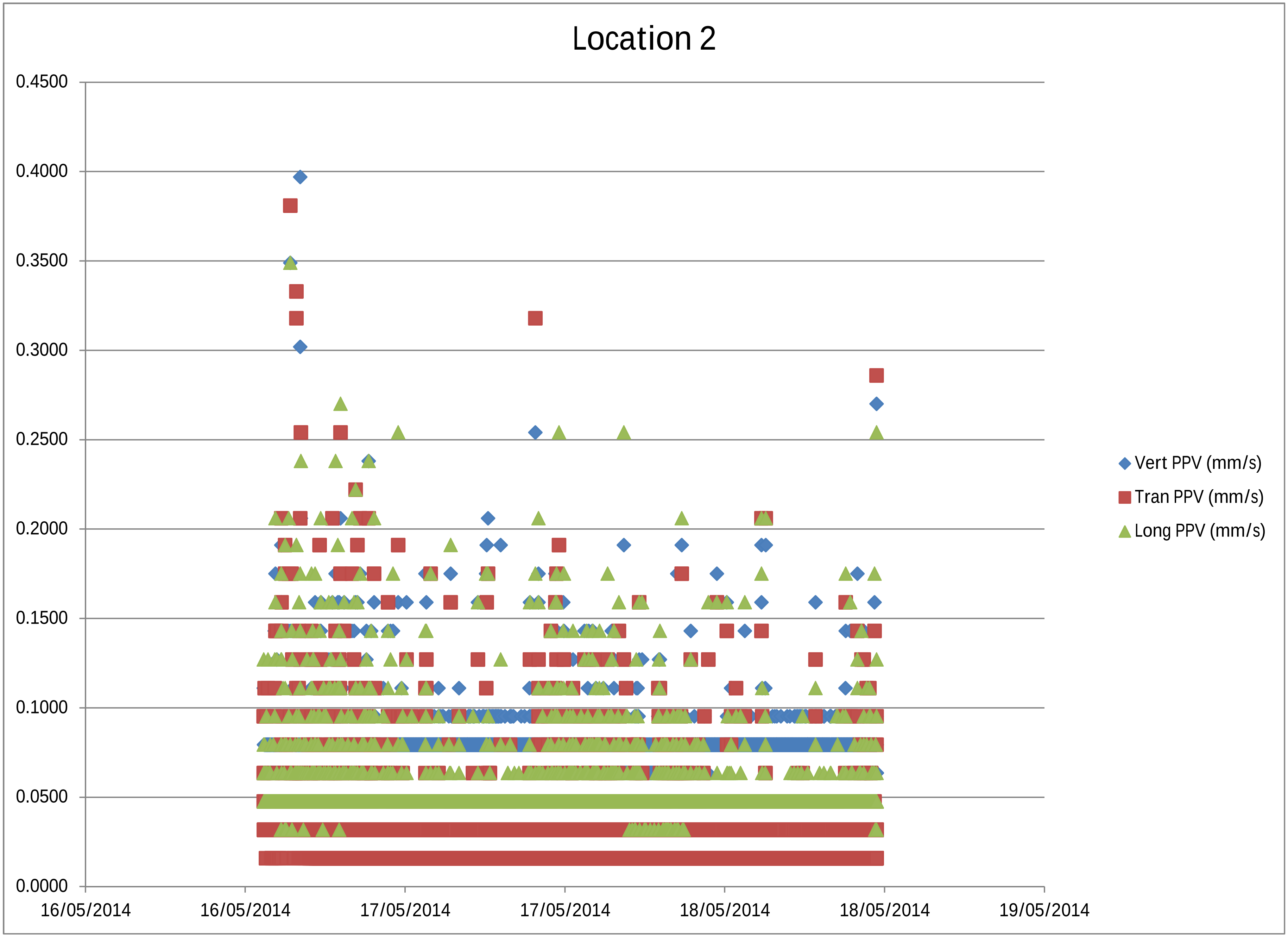
Project: *TTC Finch LRT* **Location:** *Loc1*
PN: *60318592*

Statistics	**All Valid Data**					**All Valid Weekday Data**					**All Valid Weekend Data**				
	Time Period	Day-time	Evening	Night	ALL	Time Period	Day-time	Evening	Night	ALL	Time Period	Day-time	Evening	Night	ALL
Vertical PPV (mm/s)	Minimum Value	0.1270	0.1270	0.1110	0.1110	Minimum Value	0.1590	0.1590	0.1270	0.1270	Minimum Value	0.1270	0.1270	0.1110	0.1110
	Maximum Value	0.7300	0.4130	0.5560	0.7300	Maximum Value	0.7300	0.4130	0.5560	0.7300	Maximum Value	0.4600	0.3970	0.4440	0.4600
	Mean Value	0.2889	0.2651	0.2464	0.2699	Mean Value	0.2994	0.2680	0.2521	0.2771	Mean Value	0.2718	0.2603	0.2368	0.2577
	Standard Deviation	0.0670	0.0543	0.0662	0.0674	Standard Deviation	0.0694	0.0504	0.0694	0.0698	Standard Deviation	0.0590	0.0605	0.0596	0.0614
	Number of Samples	469	174	346	989	Number of Samples	291	110	218	619	Number of Samples	178	64	128	370
Transverse PPV (mm/s)	Minimum Value	0.1270	0.1270	0.0794	0.0794	Minimum Value	0.1270	0.1430	0.0794	0.0794	Minimum Value	0.1430	0.1270	0.0952	0.0952
	Maximum Value	0.3970	0.3810	0.4130	0.4130	Maximum Value	0.3970	0.3170	0.3810	0.3970	Maximum Value	0.3330	0.3810	0.4130	0.4130
	Mean Value	0.2108	0.1993	0.1926	0.2024	Mean Value	0.2176	0.2007	0.1968	0.2073	Mean Value	0.1998	0.1969	0.1855	0.1944
	Standard Deviation	0.0415	0.0395	0.0472	0.0440	Standard Deviation	0.0433	0.0347	0.0489	0.0698	Standard Deviation	0.0360	0.0468	0.0434	0.0411
	Number of Samples	469	174	346	989	Number of Samples	291	110	218	619	Number of Samples	178	64	128	370
Longitudinal PPV (mm/s)	Minimum Value	0.1270	0.1270	0.0952	0.0952	Minimum Value	0.1430	0.1430	0.1110	0.1110	Minimum Value	0.1270	0.1270	0.0952	0.0952
	Maximum Value	0.3490	0.3490	0.3810	0.3810	Maximum Value	0.3490	0.3170	0.3810	0.3810	Maximum Value	0.3330	0.3490	0.3490	0.3490
	Mean Value	0.2079	0.2031	0.2041	0.2057	Mean Value	0.2156	0.2052	0.2069	0.2107	Mean Value	0.1952	0.1993	0.1992	0.1973
	Standard Deviation	0.0377	0.0372	0.0483	0.0417	Standard Deviation	0.0388	0.0331	0.0474	0.0413	Standard Deviation	0.0322	0.0434	0.0498	0.0409
	Number of Samples	469	174	346	989	Number of Samples	291	110	218	619	Number of Samples	178	64	128	370


Location 1
0.8000
0.7000
0.6000
0.5000
0.4000
0.3000
0.2000
0.1000
0.0000
15/05/2014
17/05/2014
19/05/2014
21/05/2014
23/05/2014
25/05/2014
27/05/2014
29/05/2014
Vert PPV (mm/s)
Tran PPV (mm/s)
Long PPV (mm/s)

Project: *TTC Finch LRT* **Location:** *Loc2*
PN: *60318592*

Statistics	**All Valid Data**					**All Valid Weekday Data**					**All Valid Weekend Data**				
	Time Period	Day-time	Evening	Night	ALL	Time Period	Day-time	Evening	Night	ALL	Time Period	Day-time	Evening	Night	ALL
Vertical PPV (mm/s)	Minimum Value	0.0476	0.0476	0.0794	0.0476	Minimum Value	0.0476	0.0635	0.0794	0.0476	Minimum Value	0.0476	0.0476	0.0794	0.0476
	Maximum Value	0.3970	0.2380	0.2060	0.3970	Maximum Value	0.3970	0.2380	0.1590	0.3970	Maximum Value	0.2700	0.1910	0.2060	0.2700
	Mean Value	0.0743	0.0759	0.0797	0.0765	Mean Value	0.0680	0.0786	0.0797	0.0731	Mean Value	0.0764	0.0733	0.0797	0.0775
	Standard Deviation	0.0109	0.0089	0.0040	0.0091	Standard Deviation	0.0144	0.0079	0.0041	0.0128	Standard Deviation	0.0084	0.0091	0.0040	0.0073
	Number of Samples	15994	5760	11520	33274	Number of Samples	4044	2880	708	7632	Number of Samples	11950	2880	10812	25642
Transverse PPV (mm/s)	Minimum Value	0.0159	0.0159	0.0159	0.0159	Minimum Value	0.0159	0.0159	0.0159	0.0159	Minimum Value	0.0159	0.0159	0.0159	0.0159
	Maximum Value	0.3810	0.2540	0.2060	0.3810	Maximum Value	0.3810	0.2540	0.1910	0.3810	Maximum Value	0.3180	0.1750	0.2060	0.3180
	Mean Value	0.0260	0.0235	0.0172	0.0226	Mean Value	0.0325	0.0235	0.0183	0.0278	Mean Value	0.0239	0.0235	0.0171	0.0210
	Standard Deviation	0.0133	0.0131	0.0073	0.0122	Standard Deviation	0.0159	0.0150	0.0103	0.0128	Standard Deviation	0.0116	0.0108	0.0071	0.0104
	Number of Samples	15994	5760	11520	33274	Number of Samples	4044	2880	708	7632	Number of Samples	11950	2880	10812	25642
Longitudinal PPV (mm/s)	Minimum Value	0.0318	0.0318	0.0476	0.0318	Minimum Value	0.0318	0.0318	0.0476	0.0318	Minimum Value	0.0318	0.0318	0.0476	0.0318
	Maximum Value	0.3490	0.2700	0.2540	0.3490	Maximum Value	0.3490	0.2700	0.2540	0.3490	Maximum Value	0.2540	0.2060	0.2060	0.2540
	Mean Value	0.0486	0.0486	0.0479	0.0484	Mean Value	0.0494	0.0491	0.0484	0.0492	Mean Value	0.0484	0.0481	0.0479	0.0482
	Standard Deviation	0.0092	0.0091	0.0055	0.0081	Standard Deviation	0.0130	0.0112	0.0098	0.0121	Standard Deviation	0.0075	0.0063	0.0051	0.0065
	Number of Samples	15994	5760	11520	33274	Number of Samples	4044	2880	708	7632	Number of Samples	11950	2880	10812	25642


Location 2
0.4500
0.4000
0.3500
0.3000
0.2500
0.2000
0.1500
0.1000
0.0500
0.0000
16/05/2014
16/05/2014
17/05/2014
17/05/2014
18/05/2014
18/05/2014
19/05/2014
Vert PPV (mm/s)
Tran PPV (mm/s)
Long PPV (mm/s)

Project: ***TTC Finch LRT*** ***Location:*** ***Loc3***

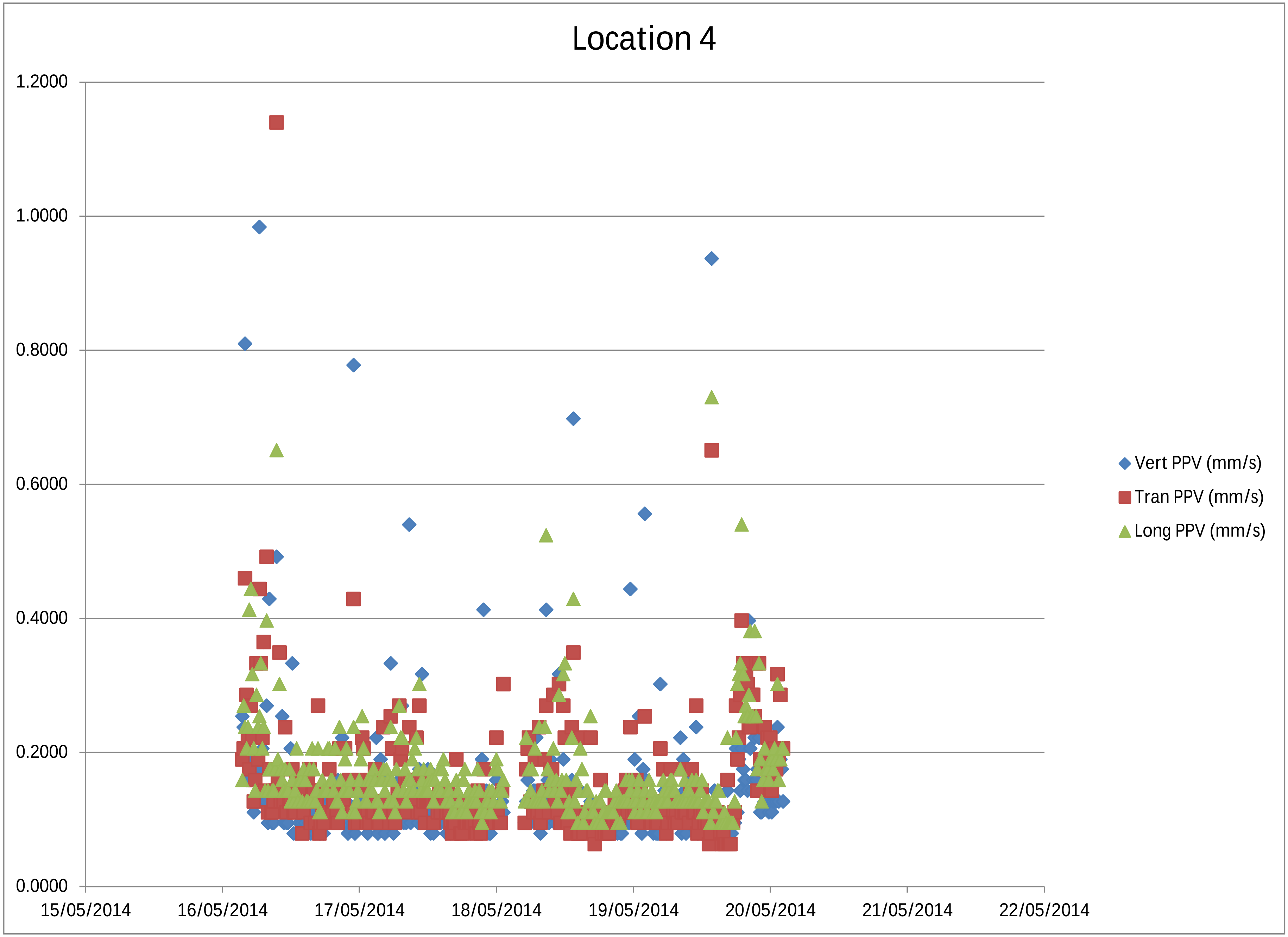
PN: ***60318592***

Statistics	**All Valid Data**					**All Valid Weekday Data**					**All Valid Weekend Data**				
	Time Period	Day-time	Evening	Night	ALL	Time Period	Day-time	Evening	Night	ALL	Time Period	Day-time	Evening	Night	ALL
Vertical PPV (mm/s)	Minimum Value	0.1270	0.1270	0.1270	0.1270	Minimum Value	0.1270	0.1270	0.1270	0.1270	Minimum Value	0.1270	0.1270	0.1270	0.1270
	Maximum Value	0.5080	0.3810	0.2540	0.5080	Maximum Value	0.5080	0.3810	0.2540	0.5080	Maximum Value	0.5080	0.2540	0.2540	0.5080
	Mean Value	0.1822	0.2024	0.2452	0.2074	Mean Value	0.1735	0.2086	0.2413	0.2029	Mean Value	0.1974	0.1918	0.2520	0.2154
	Standard Deviation	0.0649	0.0629	0.0322	0.0622	Standard Deviation	0.0629	0.0618	0.0382	0.0632	Standard Deviation	0.0655	0.0637	0.0158	0.0597
	Number of Samples	1456	522	1042	3020	Number of Samples	924	330	658	1912	Number of Samples	532	192	384	1108
Transverse PPV (mm/s)	Minimum Value	0.1270	0.1270	0.1270	0.1270	Minimum Value	0.1270	0.1270	0.1270	0.1270	Minimum Value	0.1270	0.1270	0.1270	0.1270
	Maximum Value	0.5080	0.5080	0.3810	0.5080	Maximum Value	0.5080	0.5080	0.2540	0.5080	Maximum Value	0.5080	0.3810	0.3810	0.5080
	Mean Value	0.1546	0.1574	0.1850	0.1656	Mean Value	0.1494	0.1589	0.1698	0.1581	Mean Value	0.1635	0.1548	0.2110	0.1785
	Standard Deviation	0.0557	0.0565	0.0638	0.0604	Standard Deviation	0.0526	0.0578	0.0601	0.0632	Standard Deviation	0.0596	0.0542	0.0616	0.0640
	Number of Samples	1456	522	1042	3020	Number of Samples	924	330	658	1912	Number of Samples	532	192	384	1108
Longitudinal PPV (mm/s)	Minimum Value	0.0000	0.0000	0.0000	0.0000	Minimum Value	0.0000	0.0000	0.0000	0.0000	Minimum Value	0.0000	0.0000	0.0000	0.0000
	Maximum Value	0.2540	0.1270	0.1270	0.2540	Maximum Value	0.2540	0.1270	0.1270	0.2540	Maximum Value	0.1270	0.1270	0.0000	0.1270
	Mean Value	0.0553	0.0270	0.0005	0.0315	Mean Value	0.0587	0.0266	0.0008	0.0332	Mean Value	0.0494	0.0278	0.0000	0.0285
	Standard Deviation	0.0669	0.0520	0.0079	0.0571	Standard Deviation	0.0694	0.0517	0.0099	0.0592	Standard Deviation	0.0620	0.0526	0.0000	0.0530
	Number of Samples	1456	522	1042	3020	Number of Samples	924	330	658	1912	Number of Samples	532	192	384	1108


Location 3
0.6000
0.5000
0.4000
0.3000
0.2000
0.1000
0.0000
15/05/2014
17/05/2014
19/05/2014
21/05/2014
23/05/2014
25/05/2014
27/05/2014
29/05/2014
Vert PPV (mm/s)
Tran PPV (mm/s)
Long PPV (mm/s)

Project: ***TTC Finch LRT*** **Location:** ***Loc4***
PN: ***60318592***

Statistics	**All Valid Data**					**All Valid Weekday Data**					**All Valid Weekend Data**				
	Time Period	Day-time	Evening	Night	ALL	Time Period	Day-time	Evening	Night	ALL	Time Period	Day-time	Evening	Night	ALL
Vertical PPV (mm/s)	Minimum Value	0.0794	0.0794	0.0794	0.0794	Minimum Value	0.0794	0.0794	0.0794	0.0794	Minimum Value	0.0794	0.0794	0.0794	0.0794
	Maximum Value	0.9840	0.5400	0.9370	0.9840	Maximum Value	0.9840	0.4920	0.9370	0.9840	Maximum Value	0.7780	0.5400	0.3330	0.7780
	Mean Value	0.1487	0.1558	0.1158	0.1384	Mean Value	0.1645	0.1538	0.1255	0.1494	Mean Value	0.1310	0.1577	0.1061	0.1269
	Standard Deviation	0.1179	0.0991	0.0965	0.1087	Standard Deviation	0.1369	0.0957	0.1314	0.1295	Standard Deviation	0.0896	0.1039	0.0364	0.0798
	Number of Samples	174	64	128	366	Number of Samples	92	32	64	188	Number of Samples	82	32	64	178
Transverse PPV (mm/s)	Minimum Value	0.0794	0.0794	0.0635	0.0635	Minimum Value	0.0794	0.0794	0.0635	0.0635	Minimum Value	0.0794	0.0952	0.0794	0.0794
	Maximum Value	0.4600	1.1400	0.6510	1.1400	Maximum Value	0.4600	1.1400	0.6510	1.1400	Maximum Value	0.4290	0.3020	0.2700	0.4290
	Mean Value	0.1611	0.1751	0.1312	0.1531	Mean Value	0.1808	0.1840	0.1347	0.1656	Mean Value	0.1390	0.1662	0.1278	0.1398
	Standard Deviation	0.0757	0.1417	0.0738	0.0914	Standard Deviation	0.0843	0.1929	0.0974	0.1295	Standard Deviation	0.0575	0.0586	0.0384	0.0531
	Number of Samples	174	64	128	366	Number of Samples	92	32	64	188	Number of Samples	82	32	64	178
Longitudinal PPV (mm/s)	Minimum Value	0.0952	0.1270	0.0952	0.0952	Minimum Value	0.0952	0.1270	0.0952	0.0952	Minimum Value	0.0952	0.1270	0.1110	0.0952
	Maximum Value	0.4440	0.6510	0.7300	0.7300	Maximum Value	0.4440	0.6510	0.7300	0.7300	Maximum Value	0.2700	0.5240	0.3330	0.5240
	Mean Value	0.1685	0.1809	0.1588	0.1673	Mean Value	0.1820	0.1763	0.1632	0.1746	Mean Value	0.1534	0.1856	0.1543	0.1595
	Standard Deviation	0.0618	0.0896	0.0826	0.0750	Standard Deviation	0.0752	0.1023	0.1100	0.0929	Standard Deviation	0.0370	0.0762	0.0403	0.0487
	Number of Samples	174	64	128	366	Number of Samples	92	32	64	188	Number of Samples	82	32	64	178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0.4000
0.2000
0.0000
15/05/2014
16/05/2014
17/05/2014
18/05/2014
19/05/2014
20/05/2014
21/05/2014
22/05/2014
◆ Vert PPV (mm/s)
■ Tran PPV (mm/s)
▲ Long PPV (mm/s)

Appendix C

Appendix C: Noise Model Inputs (Operations)

Configuration Settings

Configuration	
Parameter	Value
General	
Country	(user defined)
Max. Error (dB)	0.00
Max. Search Radius (m)	2000.00
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (m)	1000.00
Min. Length of Section (m)	1.00
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Reference Time Day (min)	60.00
Reference Time Night (min)	60.00
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	6.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	2
Search Radius Src	100.00
Search Radius Rcvr	100.00
Max. Distance Source - Rcvr	1000.00 1000.00
Min. Distance Rvcr - Reflector	1.00 1.00
Min. Distance Source - Reflector	0.10
Industrial (ISO 9613)	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Excl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0

Finch MSF - Reference Design Mitigated

Configuration	
Parameter	Value
Temperature (°C)	10
rel. Humidity (%)	70
Ground Absorption G	0.00
Wind Speed for Dir. (m/s)	3.0
Roads (TNM)	
Railways (Schall 03)	
Strictly acc. to Schall 03 / Schall-Transrapid	
Aircraft (???)	
Strictly acc. to AzB	

Results Table

Receiver		Land Use	Limiting Value		rel. Axis			Lr w/o Noise Control		dL req.		Lr w/ Noise Control		Exceeding		passive NC
Name	ID		Day	Night	Station	Distance	Height	Day	Night	Day	Night	Day	Night	Day	Night	
			dB(A)	dB(A)	m	m	m	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
Wheatsheaf_res1	Wheatsheaf_res1		51	51	430	146.02	3.12	68.1	68.1	17.6	17.6	64.1	64.1	13.6	13.6	13.6
Wheatsheaf_res2	Wheatsheaf_res2		51	52	352	146.07	3.20	67.7	67.7	17.2	16.2	63.8	63.8	13.3	12.3	13.3
Yorkgate_appt	Yorkgate_appt		55	59	477	207.38	10.99	64.2	64.2	9.7	5.7	62.6	62.6	8.1	4.1	8.1
Yorkgate_res	Yorkgate_res		55	59	477	248.02	4.89	62.8	62.8	8.3	4.3	63.3	63.3	8.8	4.8	8.8
ElanaDr	ElanaDr		68	69	343	90.69	2.14	67.7	67.7	0.2	-	74.7	74.7	7.2	6.2	7.2
Pelican_nursing	Pelican_nursing		68	69	417	90.86	5.08	66.6	66.6	-	-	74.0	74.0	6.5	5.5	6.5
Pelican_medical	Pelican_medical		68	69	355	95.52	13.27	66.5	66.5	-	-	70.0	70.0	2.5	1.5	2.5
NorFinch_medical	NorFinch_medical		68	69	29	71.53	7.43	67.0	67.0	-	-	68.5	68.5	1.0	-	1.0
NorFinch_school	NorFinch_school		51	52	207	43.27	-0.68	71.4	71.4	20.9	19.9	68.3	68.3	17.8	16.8	17.8

Sound Sources

Point Sources

Name	M.	ID	Result. PWL			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night						X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		(m)		(m)	(m)	(m)
On site Crossover01 - 20 20 50	~	OPT1unmit_cross01	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618991.11	4846090.06	178.10
On site Crossover02 - 20 20 50	~	OPT1unmit_cross02	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618999.30	4846065.50	178.10
On site Crossover03 - 20 20 50	~	OPT1unmit_cross03	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	619004.90	4846044.81	178.10
On site Crossover04 - 20 20 50	~	OPT1unmit_cross04	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	619010.08	4846026.28	177.93
On site Crossover05 - 20 20 50	~	OPT1unmit_cross05	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	619017.40	4846000.43	177.69
On site Crossover06 - 20 20 50	~	OPT1unmit_cross06	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	619025.59	4845975.00	177.45
On site Crossover07 - 20 20 50	~	OPT1unmit_cross07	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618827.79	4845919.41	178.17
On site Crossover08 - 20 20 50	~	OPT1unmit_cross08	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618801.93	4845950.87	178.36
On site Crossover09 - 20 20 50	~	OPT1unmit_cross09	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618790.73	4845968.54	178.45
On site Crossover10 - 20 20 50	~	OPT1unmit_cross10	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618780.39	4845986.21	178.60
On site Crossover11 - 20 20 50	~	OPT1unmit_cross11	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618771.77	4846003.44	178.75
On site Crossover12 - 20 20 50	~	OPT1unmit_cross12	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618761.43	4846017.67	178.88
On site Crossover01 - 10 10 15	~	OPT1mit_cross01	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618991.11	4846090.06	178.10
On site Crossover02 - 10 10 15	~	OPT1mit_cross02	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618999.30	4846065.50	178.10
On site Crossover03 - 10 10 15	~	OPT1mit_cross03	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	619004.90	4846044.81	178.10
On site Crossover04 - 10 10 15	~	OPT1mit_cross04	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	619010.08	4846026.28	177.93
On site Crossover05 - 10 10 15	~	OPT1mit_cross05	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	619017.40	4846000.43	177.69
On site Crossover06 - 10 10 15	~	OPT1mit_cross06	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	619025.59	4845975.00	177.45
On site Crossover07 - 10 10 15	~	OPT1mit_cross07	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618827.79	4845919.41	178.17
On site Crossover08 - 10 10 15	~	OPT1mit_cross08	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618801.93	4845950.87	178.36
On site Crossover09 - 10 10 15	~	OPT1mit_cross09	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618790.73	4845968.54	178.45

Finch MSF - Reference Design Mitigated

Name	M.	ID	Result. PWL			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night						X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		(m)		(m)	(m)	(m)
On site Crossover10 - 10 10 15	~	OPT1mit_cross10	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618780.39	4845986.21	178.60
On site Crossover11 - 10 10 15	~	OPT1mit_cross11	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618771.77	4846003.44	178.75
On site Crossover12 - 10 10 15	~	OPT1mit_cross12	98.1	98.1	101.9	Lw	pCrossover10		10.0	10.0	13.8							0.0		(none)	0.10	r	618761.43	4846017.67	178.88
On site Crossover01 - 20 20 50	~	OPT2unmit_cross01	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618959.60	4845910.42	177.44
On site Crossover02 - 20 20 50	~	OPT2unmit_cross02	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618935.03	4845902.23	177.68
On site Crossover03 - 20 20 50	~	OPT2unmit_cross03	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618914.35	4845896.63	177.89
On site Crossover04 - 20 20 50	~	OPT2unmit_cross04	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618895.82	4845891.46	178.07
On site Crossover05 - 20 20 50	~	OPT2unmit_cross05	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618869.97	4845884.14	178.10
On site Crossover06 - 20 20 50	~	OPT2unmit_cross06	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618844.54	4845875.95	178.02
On site Crossover07 - 20 20 50	~	OPT2unmit_cross07	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618771.71	4846103.48	179.41
On site Crossover08 - 20 20 50	~	OPT2unmit_cross08	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618812.65	4846116.19	179.25
On site Crossover09 - 20 20 50	~	OPT2unmit_cross09	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618833.55	4846124.81	179.13
On site Crossover10 - 20 20 50	~	OPT2unmit_cross10	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618849.28	4846133.86	179.10
On site Crossover11 - 20 20 50	~	OPT2unmit_cross11	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618869.97	4846141.40	178.98
On site Crossover12 - 20 20 50	~	OPT2unmit_cross12	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618881.17	4846150.02	178.92
On site Crossover01 - 10 10 15	~	OPT2mit_cross01	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618959.60	4845910.42	177.44
On site Crossover02 - 10 10 15	~	OPT2mit_cross02	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618935.03	4845902.23	177.68
On site Crossover03 - 10 10 15	~	OPT2mit_cross03	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618914.35	4845896.63	177.89
On site Crossover04 - 10 10 15	~	OPT2mit_cross04	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618895.82	4845891.46	178.07
On site Crossover05 - 10 10 15	~	OPT2mit_cross05	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618869.97	4845884.14	178.10
On site Crossover06 - 10 10 15	~	OPT2mit_cross06	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618844.54	4845875.95	178.02
On site Crossover07 - 10 10 15	~	OPT2mit_cross07	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618771.71	4846103.48	179.41
On site Crossover08 - 10 10 15	~	OPT2mit_cross08	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618812.65	4846116.19	179.25
On site Crossover09 - 10 10 15	~	OPT2mit_cross09	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618833.55	4846124.81	179.13
On site Crossover10 - 10 10 15	~	OPT2mit_cross10	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618849.28	4846133.86	179.10
On site Crossover11 - 10 10 15	~	OPT2mit_cross11	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618869.97	4846141.40	178.98
On site Crossover12 - 10 10 15	~	OPT2mit_cross12	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618881.17	4846150.02	178.92
On site Crossover01 - 20 20 50	~	OPT3unmit_cross01	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618784.00	4845948.25	178.28
On site Crossover02 - 20 20 50	~	OPT3unmit_cross02	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618775.81	4845972.82	178.49
On site Crossover03 - 20 20 50	~	OPT3unmit_cross03	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618770.21	4845993.50	178.67
On site Crossover04 - 20 20 50	~	OPT3unmit_cross04	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618765.04	4846012.03	178.83
On site Crossover05 - 20 20 50	~	OPT3unmit_cross05	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618757.71	4846037.89	179.06
On site Crossover06 - 20 20 50	~	OPT3unmit_cross06	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618749.53	4846063.31	179.26
On site Crossover07 - 20 20 50	~	OPT3unmit_cross07	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618976.63	4846136.57	178.38
On site Crossover08 - 20 20 50	~	OPT3unmit_cross08	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618981.37	4846108.56	178.22
On site Crossover09 - 20 20 50	~	OPT3unmit_cross09	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618988.69	4846071.50	178.10
On site Crossover10 - 20 20 50	~	OPT3unmit_cross10	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	619000.76	4846055.55	178.10
On site Crossover11 - 20 20 50	~	OPT3unmit_cross11	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	619010.24	4846039.18	178.04
On site Crossover12 - 20 20 50	~	OPT3unmit_cross12	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	619013.69	4846020.65	177.87
On site Crossover01 - 10 10 15	~	OPT3mit_cross01	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618784.00	4845948.25	178.28
On site Crossover02 - 10 10 15	~	OPT3mit_cross02	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618775.81	4845972.82	178.49
On site Crossover03 - 10 10 15	~	OPT3mit_cross03	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618770.21	4845993.50	178.67
On site Crossover04 - 10 10 15	~	OPT3mit_cross04	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618765.04	4846012.03	178.83
On site Crossover05 - 10 10 15	~	OPT3mit_cross05	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618757.71	4846037.89	179.06
On site Crossover06 - 10 10 15	~	OPT3mit_cross06	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618749.53	4846063.31	179.26
On site Crossover07 - 10 10 15	~	OPT3mit_cross07	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618976.63	4846136.57	178.38
On site Crossover08 - 10 10 15	~	OPT3mit_cross08	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618981.37	4846108.56	178.22
On site Crossover09 - 10 10 15	~	OPT3mit_cross09	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618988.69	4846071.50	178.10
On site Crossover10 - 10 10 15	~	OPT3mit_cross10	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	619000.76	4846055.55	178.10
On site Crossover11 - 10 10 15	~	OPT3mit_cross11	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	619010.24	4846039.18	178.04
On site Crossover12 - 10 10 15	~	OPT3mit_cross12	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	619013.69	4846020.65	177.87
On site Crossover01 - 20 20 50	~	OPT4unmit_cross01	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618799.97	4846122.43	179.37
On site Crossover02 - 20 20 50	~	OPT4unmit_cross02	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618824.53	4846130.62	179.23
On site Crossover03 - 20 20 50	~	OPT4unmit_cross03	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618845.21	4846136.22	179.10
On site Crossover04 - 20 20 50	~	OPT4unmit_cross04	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618863.74	4846141.39	179.03
On site Crossover05 - 20 20 50	~	OPT4unmit_cross05	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618889.60	4846148.72	178.85
On site Crossover06 - 20 20 50	~	OPT4unmit_cross06	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618915.02	4846156.91	178.73
On site Crossover07 - 20 20 50	~	OPT4unmit_cross07	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618980.38	4845925.45	177.31
On site Crossover08 - 20 20 50	~	OPT4unmit_cross08	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618946.75	4845912.08	177.58
On site Crossover09 - 20 20 50	~	OPT4unmit_cross09	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618928.54	4845904.67	177.76
On site Crossover10 - 20 20 50	~	OPT4unmit_cross10	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618909.25	4845897.59	177.94
On site Crossover11 - 20 20 50	~	OPT4unmit_cross11	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618890.92	4845891.14	178.10
On site Crossover12 - 20 20 50	~	OPT4unmit_cross12	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618873.99	4845882.97	178.10
On site Crossover01 - 10 10 15	~	OPT4mit_cross01	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618799.97	4846122.43	179.37
On site Crossover02 - 10 10 15	~	OPT4mit_cross02	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618824.53	4846130.62	179.23
On site Crossover03 - 10 10 15	~	OPT4mit_cross03	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618845.21	4846136.22	179.10
On site Crossover04 - 10 10 15	~	OPT4mit_cross04	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618863.74	4846141.39	179.03
On site Crossover05 - 10 10 15	~	OPT4mit_cross05	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618889.60	4846148.72	178.85
On site Crossover06 - 10 10 15	~	OPT4mit_cross06	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618915.02	4846156.91	178.73
On site Crossover07 - 10 10 15	~	OPT4mit_cross07	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618980.38	4845925.45	177.31
On site Crossover08 - 10 10 15	~	OPT4mit_cross08	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618946.75	4845912.08	177.58

Finch MSF - Reference Design Mitigated

Name	M.	ID	Result. PWL			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night						X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		(m)		(m)	(m)	(m)
On site Crossover09 - 10 10 15	~	OPT4mit_cross09	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618928.54	4845904.67	177.76
On site Crossover10 - 10 10 15	~	OPT4mit_cross10	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618909.25	4845897.59	177.94
On site Crossover11 - 10 10 15	~	OPT4mit_cross11	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618890.92	4845891.14	178.10
On site Crossover12 - 10 10 15	~	OPT4mit_cross12	98.1	98.1	99.9	Lw	pCrossover10		10.0	10.0	11.8							0.0		(none)	0.10	r	618873.99	4845882.97	178.10
Emergency Generator 1	~	OPT1unmit_gen1	116.0	116.0	116.0	Lw	pGen800_1		0.0	0.0	0.0							0.0		(none)	3.00	r	618938.78	4846168.69	181.60
Emergency Generator 1	~	OPT2unmit_gen1	116.0	116.0	116.0	Lw	pGen800_1		0.0	0.0	0.0							0.0		(none)	3.00	r	619038.23	4845962.76	180.22
Emergency Generator 1	~	OPT3unmit_gen1	116.0	116.0	116.0	Lw	pGen800_1		0.0	0.0	0.0							0.0		(none)	3.00	r	618836.34	4845869.63	180.84
Emergency Generator 1	~	OPT4unmit_gen1	116.0	116.0	116.0	Lw	pGen800_1		0.0	0.0	0.0							0.0		(none)	3.00	r	618721.34	4846070.09	182.13
Emergency Generator 2	~	OPT1unmit_gen2	116.0	116.0	116.0	Lw	pGen800_2		0.0	0.0	0.0							0.0		(none)	3.00	r	618930.16	4846166.75	181.63
Emergency Generator 2	~	OPT2unmit_gen2	116.0	116.0	116.0	Lw	pGen800_2		0.0	0.0	0.0							0.0		(none)	3.00	r	619036.29	4845971.38	180.29
Emergency Generator 2	~	OPT3unmit_gen2	116.0	116.0	116.0	Lw	pGen800_2		0.0	0.0	0.0							0.0		(none)	3.00	r	618844.95	4845871.56	180.88
Emergency Generator 2	~	OPT4unmit_gen2	116.0	116.0	116.0	Lw	pGen800_2		0.0	0.0	0.0							0.0		(none)	3.00	r	618723.27	4846061.48	182.05
Emergency Generator 1	-	OPT1mit_gen1	116.0	116.0	116.0	Lw	pGen800_1		0.0	0.0	0.0				60.00	0.00	0.00	0.0		(none)	3.00	r	618938.78	4846168.69	181.60
Emergency Generator 1	-	OPT2mit_gen1	106.0	106.0	106.0	Lw	pGen800_1		0.0	0.0	0.0			10	60.00	0.00	0.00	0.0		(none)	3.00	r	619038.23	4845962.76	180.22
Emergency Generator 1	-	OPT3mit_gen1	106.0	106.0	106.0	Lw	pGen800_1		0.0	0.0	0.0			10	60.00	0.00	0.00	0.0		(none)	3.00	r	618836.34	4845869.63	180.84
Emergency Generator 1	-	OPT4mit_gen1	90.0	90.0	90.0	Lw	pGen800_1		0.0	0.0	0.0			26	60.00	0.00	0.00	0.0		(none)	3.00	r	618721.34	4846070.09	182.13
Emergency Generator 2	-	OPT1mit_gen2	116.0	116.0	116.0	Lw	pGen800_2		0.0	0.0	0.0				60.00	0.00	0.00	0.0		(none)	3.00	r	618930.16	4846166.75	181.63
Emergency Generator 2	-	OPT2mit_gen2	106.0	106.0	106.0	Lw	pGen800_2		0.0	0.0	0.0			10	60.00	0.00	0.00	0.0		(none)	3.00	r	619036.29	4845971.38	180.29
Emergency Generator 2	-	OPT3mit_gen2	106.0	106.0	106.0	Lw	pGen800_2		0.0	0.0	0.0			10	60.00	0.00	0.00	0.0		(none)	3.00	r	618844.95	4845871.56	180.88
Emergency Generator 2	-	OPT4mit_gen2	90.0	90.0	90.0	Lw	pGen800_2		0.0	0.0	0.0			26	60.00	0.00	0.00	0.0		(none)	3.00	r	618723.27	4846061.48	182.05
Transformer	~	OPT1_transformer	100.6	100.6	100.6	Lw	pTransformer		0.0	0.0	0.0							0.0		(none)	3.00	r	618944.16	4846166.83	181.57
Transformer	~	OPT2_transformer	100.6	100.6	100.6	Lw	pTransformer		0.0	0.0	0.0							0.0		(none)	3.00	r	619036.37	4845957.38	180.18
Transformer	~	OPT3_transformer	100.6	100.6	100.6	Lw	pTransformer		0.0	0.0	0.0							0.0		(none)	3.00	r	618830.95	4845871.48	180.84
Transformer	~	OPT4_transformer	100.6	100.6	100.6	Lw	pTransformer		0.0	0.0	0.0							0.0		(none)	3.00	r	618723.19	4846075.48	182.19
site wheel squeal 1 - 20 20 50	~	OPT1unmit_squeal1	106.1	106.1	110.1	Lw	pWheelSqueal		13.0	13.0	17.0							0.0		(none)	0.10	r	619045.00	4845941.08	177.16
site wheel squeal 2 - 20 20 50	~	OPT1unmit_squeal2	106.1	106.1	110.1	Lw	pWheelSqueal		13.0	13.0	17.0							0.0		(none)	0.10	r	618845.47	4845875.15	178.02
site wheel squeal 3 - 20 20 50	~	OPT1unmit_squeal3	106.1	106.1	110.1	Lw	pWheelSqueal		13.0	13.0	17.0							0.0		(none)	0.10	r	618725.67	4846066.06	179.20
site wheel squeal 4 - 20 20 50	~	OPT1unmit_squeal4	106.1	106.1	110.1	Lw	pWheelSqueal		13.0	13.0	17.0							0.0		(none)	0.10	r	618980.36	4846158.71	178.53
site wheel squeal 1 - 10 10 15	~	OPT1mit_squeal1	98.1	98.1	99.9	Lw	pWheelSqueal		10.0	10.0	11.8			5				0.0		(none)	0.10	r	619045.00	4845941.08	177.16
site wheel squeal 2 - 10 10 15	~	OPT1mit_squeal2	98.1	98.1	99.9	Lw	pWheelSqueal		10.0	10.0	11.8			5				0.0		(none)	0.10	r	618845.47	4845875.15	178.02
site wheel squeal 3 - 10 10 15	~	OPT1mit_squeal3	98.1	98.1	99.9	Lw	pWheelSqueal		10.0	10.0	11.8			5				0.0		(none)	0.10	r	618725.67	4846066.06	179.20
site wheel squeal 4 - 10 10 15	~	OPT1mit_squeal4	98.1	98.1	99.9	Lw	pWheelSqueal		10.0	10.0	11.8			5				0.0		(none)	0.10	r	618980.36	4846158.71	178.53
site wheel squeal 1 - 20 20 50	~	OPT2unmit_squeal1	106.1	106.1	110.1	Lw	pWheelSqueal		13.0	13.0	17.0							0.0		(none)	0.10	r	618810.62	4845856.54	177.70
site wheel squeal 2 - 20 20 50	~	OPT2unmit_squeal2	106.1	106.1	110.1	Lw	pWheelSqueal		13.0	13.0	17.0							0.0		(none)	0.10	r	618736.50	4846086.66	179.46
site wheel squeal 3 - 20 20 50	~	OPT2unmit_squeal3	106.1	106.1	110.1	Lw	pWheelSqueal		13.0	13.0	17.0							0.0		(none)	0.10	r	618937.99	4846171.42	178.72
site wheel squeal 4 - 20 20 50	~	OPT2unmit_squeal4	106.1	106.1	110.1	Lw	pWheelSqueal		13.0	13.0	17.0							0.0		(none)	0.10	r	619024.48	4845925.28	177.10
site wheel squeal 1 - 10 10 15	~	OPT2mit_squeal1	98.1	98.1	99.9	Lw	pWheelSqueal		10.0	10.0	11.8			5				0.0		(none)	0.10	r	618810.62	4845856.54	177.70
site wheel squeal 2 - 10 10 15	~	OPT2mit_squeal2	98.1	98.1	99.9	Lw	pWheelSqueal		10.0	10.0	11.8			5				0.0		(none)	0.10	r	618736.50	4846086.66	179.46
site wheel squeal 3 - 10 10 15	~	OPT2mit_squeal3	98.1	98.1	99.9	Lw	pWheelSqueal		10.0	10.0	11.8			5				0.0		(none)	0.10	r	618937.99	4846171.42	178.72
site wheel squeal 4 - 10 10 15	~	OPT2mit_squeal4	98.1	98.1	99.9	Lw	pWheelSqueal		10.0	10.0	11.8			5				0.0		(none)	0.10	r	619024.48	4845925.28	177.10
site wheel squeal 1 - 20 20 50	~	OPT3unmit_squeal1	106.1	106.1	110.1	Lw	pWheelSqueal		13.0	13.0	17.0							0.0		(none)	0.10	r	618730.12	4846097.23	179.54
site wheel squeal 2 - 20 20 50	~	OPT3unmit_squeal2	106.1	106.1	110.1	Lw	pWheelSqueal		13.0	13.0	17.0							0.0		(none)	0.10	r	618980.06	4846171.78	178.61
site wheel squeal 3 - 20 20 50	~	OPT3unmit_squeal3	106.1	106.1	110.1	Lw	pWheelSqueal		13.0	13.0	17.0							0.0		(none)	0.10	r	619044.99	4845969.86	177.37
site wheel squeal 4 - 20 20 50	~	OPT3unmit_squeal4	106.1	106.1	110.1	Lw	pWheelSqueal		13.0	13.0	17.0							0.0		(none)	0.10	r	618798.86	4845883.37	177.92
site wheel squeal 1 - 10 10 15	~	OPT3mit_squeal1	98.1	98.1	99.9	Lw	pWheelSqueal		10.0	10.0	11.8			5				0.0		(none)	0.10	r	618730.12	4846097.23	179.54
site wheel squeal 2 - 10 10 15	~	OPT3mit_squeal2	98.1	98.1	99.9	Lw	pWheelSqueal		10.0	10.0	11.8			5				0.0		(none)	0.10	r	618980.06	4846171.78	178.61
site wheel squeal 3 - 10 10 15	~	OPT3mit_squeal3	98.1	98.1	99.9	Lw	pWheelSqueal		10.0	10.0	11.8			5				0.0		(none)	0.10	r	619044.99	4845969.86	177.37
site wheel squeal 4 - 10 10 15	~	OPT3mit_squeal4	98.1	98.1	99.9	Lw	pWheelSqueal		10.0	10.0	11.8			5				0.0		(none)	0.10	r	618798.86	4845883.37	177.92
site wheel squeal 1 - 20 20 50	~	OPT4unmit_squeal1	106.1	106.1	110.1	Lw	pWheelSqueal		13.0	13.0	17.0							0.0		(none)	0.10	r	618948.94	4846176.31	178.70
site wheel squeal 2 - 20 20 50	~	OPT4unmit_squeal2	106.1	106.1	110.1	Lw	pWheelSqueal		13.0	13.0	17.0							0.0		(none)	0.10	r	619035.50	4845945.30	177.19
site wheel squeal 3 - 20 20 50	~	OPT4unmit_squeal3	106.1	106.1	110.1	Lw	pWheelSqueal		13.0	13.0	17.0							0.0		(none)	0.10	r	618821.57	4845861.44	177.80
site wheel squeal 4 - 20 20 50	~	OPT4unmit_squeal4	106.1	106.1	110.1	Lw	pWheelSqueal		13.0	13.0	17.0							0.0		(none)	0.10	r	618735.08	4846107.57	179.65
site wheel squeal 1 - 10 10 15	~	OPT4mit_squeal1	98.1	98.1	99.9	Lw	pWheelSqueal		10.0	10.0	11.8			5				0.0		(none)	0.10	r	618948.94	4846176.31	178.70
site wheel squeal 2 - 10 10 15	~	OPT4mit_squeal2	98.1	98.1	99.9	Lw	pWheelSqueal		10.0	10.0	11.8			5				0.0		(none)	0.10	r	619035.50	4845945.30	177.19
site wheel squeal 3 - 10 10 15	~	OPT4mit_squeal3	98.1	98.1	99.9	Lw	pWheelSqueal		10.0	10.0	11.8			5				0.0		(none)	0.10	r	618821.57	4845861.44	177.80
site wheel squeal 4 - 10 10 15	~	OPT4mit_squeal4	98.1	98.1	99.9	Lw	pWheelSqueal		10.0	10.0	11.8			5				0.0		(none)	0.10	r	618735.08	4846107.57	179.65
Generator1	~	RefDunmit_Gen1	116.0	116.0	116.0	Lw	pGen800_1		0.0	0.0	0.0							0.0		(none)	3.00	r	618723.27	4845986.15	181.39
Generator2	~	RefDunmit_Gen2	116.0	116.0	116.0	Lw	pGen800_2		0.0	0.0	0.0							0.0		(none)	3.00	r	618730.06	4845986.42	181.39
Operations AC1	~	RefDunmit_OPCO_AC1	107.0	107.0	107.0	Lw	pOpsCo_AC1		0.0	0.0	0.0							0.0		(none)	1.00	g	619001.52	4845926.75	186.30
Operations AC2	~	RefDunmit_OPCO_AC2	107.0	107.0	107.0	Lw	pOpsCo_AC2		0.0	0.0	0.0							0.0		(none)	1.00	g	619042.45	4845940.32	186.30
Way compressor1	~	RefDunmit_Way_comp1	101.6	101.6	101.6	Lw	pWay_comp1		0.0	0.0	0.0							0.0		(none)	1.00	g	618822.00	4845880.80	184.73
Way baydoor 1	~	RefDunmit_Way_bdoor1	106.1	106.1	106.1	Lw	pWay_Bdoor1		0.0	0.0	0.0							3.0		(none)	3.00	r	618823.06	4845885.49	180.95
Main Shop Wheel Truing1	~	RefDunmit_Main_wheel1	119.7	119.7	119.7	Lw	pMain_Bdoor_Wheel1		0.0	0.0	0.0							3.0		(none)	3.00	r	618818.43	4846045.92	182.00
Main Shop Wheel Truing2	~	RefDunmit_Main_wheel2	119.7	119.7	119.7	Lw	pMain_Bdoor_Wheel2		0.0	0.0	0.0							3.0		(none)	3.00	r	618931.95	4846082.45	181.14
Main Shop body/paint1	~	RefDunmit_Main_body1	106.1	106.1	106.1	Lw	pMain_Bdoor_body1		0.0	0.0	0.0							3.0		(none)	3.00	r	618837.12	4846040.50	181.84
Main Shop body/paint2	~	RefDunmit_Main_body2	86.9	86.9	86.9	Lw	pMain_Bdoor_body2		0.0	0.0	0.0							3.0		(none)	3.00	r	618920.18	4846067.40	181.17
Main Shop undercar clean1	~	RefDunmit_Main_clean1	97.6	97.6	97.6	Lw	pMain_Bdoor_clean1		0.0	0.0	0.0							3.0		(none)	3.00	r	618840.34	4846030.31	181.78
Main Shop undercar clean2	~	RefDunmit_Main_clean2	97.6	97.6	97.6	Lw	pMain_Bdoor_clean2		0.0	0.0	0.0							3.0		(none)	3.00	r	618923.41	4846057.26	181.11
Main Shop daily wash 1	~	RefDunmit_Main_wash1	97.6	97.6	97.6	Lw	pMain_Bdoor_wash1		0.0	0.0	0.0							3.0		(none)	3.00	r	618843.53	4846020.19	181.69
Main Shop daily wash 2	~	RefDunmit_Main_wash2	97.6	97.6	97.6	Lw	pMain_Bdoor_wash2		0.0	0.0	0.0							3.0		(none)	3.00	r	618926.75	4846046.76	181.04
Main Shop inspection 1	~	RefDunmit_Main_insp1	106.1	106.1	106.1	Lw	pMain_Bdoor_inspec1		0.0	0.0	0.0							3.0		(none)	3.00	r	618846.21	4846011.70	181.62

Finch MSF - Reference Design Mitigated

Name	M.	ID	Result. PWL			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night						X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		(m)		(m)	(m)	(m)
Main Shop inspection 2	~	RefDunmit_Main_insp2	95.6	95.6	95.6	Lw	pMain_Bdoor_inspec2		0.0	0.0	0.0							3.0		(none)	3.00	r	618929.72	4846037.45	181.00
Main Shop maintenance 1	~	RefDunmit_Main_maint1	106.1	106.1	106.1	Lw	pMain_Bdoor_Maint1		0.0	0.0	0.0							3.0		(none)	3.00	r	618849.01	4846002.86	181.54
Main Shop maintenance 2	~	RefDunmit_Main_maint2	95.6	95.6	95.6	Lw	pMain_Bdoor_Maint2		0.0	0.0	0.0							3.0		(none)	3.00	r	618932.04	4846030.17	181.00
Main Shop maintenance 3	~	RefDunmit_Main_maint3	106.1	106.1	106.1	Lw	pMain_Bdoor_Maint3		0.0	0.0	0.0							3.0		(none)	3.00	r	618851.56	4845994.76	181.46
Main Shop maintenance 4	~	RefDunmit_Main_maint4	95.6	95.6	95.6	Lw	pMain_Bdoor_Maint4		0.0	0.0	0.0							3.0		(none)	3.00	r	618934.65	4846021.99	181.00
Main Shop compressor1	~	RefDunmit_Main_comp1	101.6	101.6	101.6	Lw	pMain_comp1		0.0	0.0	0.0							0.0		(none)	1.00	g	618901.14	4846075.97	193.50
Main Shop compressor2	~	RefDunmit_Main_comp2	101.6	101.6	101.6	Lw	pMain_comp2		0.0	0.0	0.0							0.0		(none)	1.00	g	618853.94	4846018.52	193.50
Crossover 3 20 20 50	~	RefDunmit_cross03	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618956.89	4845941.86	177.60
Crossover 4 20 20 50	~	RefDunmit_cross04	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618860.79	4845914.28	178.10
Crossover 5 20 20 50	~	RefDunmit_cross05	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618847.87	4845909.54	178.10
Crossover 6 20 20 50	~	RefDunmit_cross06	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618814.90	4845922.90	178.19
Crossover 7 20 20 50	~	RefDunmit_cross07	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618806.71	4845932.38	178.24
Crossover 820 20 50	~	RefDunmit_cross08	104.9	104.9	108.9	Lw	pCrossover20		13.0	13.0	17.0							0.0		(none)	0.10	r	618792.28	4845950.69	178.33
Crossover 9 2 2 8	~	RefDunmit_cross09	94.9	94.9	100.9	Lw	pCrossover20		3.0	3.0	9.0							0.0		(none)	0.10	r	618787.97	4845963.83	178.41
Crossover 10 1 1 4	~	RefDunmit_cross10	91.9	91.9	97.9	Lw	pCrossover20		0.0	0.0	6.0							0.0		(none)	0.10	r	618783.23	4845973.53	178.49
Crossover 11 1 1 4	~	RefDunmit_cross11	91.9	91.9	97.9	Lw	pCrossover20		0.0	0.0	6.0							0.0		(none)	0.10	r	618787.75	4845974.39	178.50
Crossover 12 18 18 42	~	RefDunmit_cross12	104.4	104.4	108.1	Lw	pCrossover20		12.5	12.5	16.2							0.0		(none)	0.10	r	618753.60	4846010.99	178.80
Crossover 13 17 17 40	~	RefDunmit_cross13	104.2	104.2	107.9	Lw	pCrossover20		12.3	12.3	16.0							0.0		(none)	0.10	r	618749.52	4846025.65	178.92
Crossover 14 13 13 32	~	RefDunmit_cross14	103.0	103.0	106.9	Lw	pCrossover20		11.1	11.1	15.0							0.0		(none)	0.10	r	618745.45	4846036.38	179.03
Crossover 15 9 9 24	~	RefDunmit_cross15	101.4	101.4	105.7	Lw	pCrossover20		9.5	9.5	13.8							0.0		(none)	0.10	r	618742.05	4846047.91	179.10
Crossover 16 5 5 16	~	RefDunmit_cross16	98.9	98.9	103.9	Lw	pCrossover20		7.0	7.0	12.0							0.0		(none)	0.10	r	618738.66	4846059.45	179.19
Crossover 17 4 4 8	~	RefDunmit_cross17	97.9	97.9	100.9	Lw	pCrossover20		6.0	6.0	9.0							0.0		(none)	0.10	r	618772.04	4846068.54	179.17
Crossover 18 4 4 8	~	RefDunmit_cross18	97.9	97.9	100.9	Lw	pCrossover20		6.0	6.0	9.0							0.0		(none)	0.10	r	618767.59	4846073.15	179.22
Crossover 19 4 4 8	~	RefDunmit_cross19	97.9	97.9	100.9	Lw	pCrossover20		6.0	6.0	9.0							0.0		(none)	0.10	r	618762.81	4846088.20	179.36
Crossover 20 4 4 8	~	RefDunmit_cross20	97.9	97.9	100.9	Lw	pCrossover20		6.0	6.0	9.0							0.0		(none)	0.10	r	618760.58	4846098.63	179.44
Wheel Squeal 2 20 20 50	~	RefDunmit_WSQ01	106.1	106.1	110.1	Lw	pWheelSqueal		13.0	13.0	17.0							0.0		(none)	0.10	r	619050.12	4845974.20	177.40
Wheel Squeal 2 20 20 50	~	RefDunmit_WSQ02	106.1	106.1	110.1	Lw	pWheelSqueal		13.0	13.0	17.0							0.0		(none)	0.10	r	618828.45	4845913.48	178.13
Wheel Squeal 3 1 1 5	~	RefDunmit_WSQ03	93.1	93.1	100.1	Lw	pWheelSqueal		0.0	0.0	7.0							0.0		(none)	0.10	r	618758.02	4846046.19	179.10
Wheel Squeal 4 4 4 8	~	RefDunmit_WSQ04	99.1	99.1	102.1	Lw	pWheelSqueal		6.0	6.0	9.0							0.0		(none)	0.10	r	618756.52	4846058.19	179.19
Wheel Squeal 5 4 4 8	~	RefDunmit_WSQ05	99.1	99.1	102.1	Lw	pWheelSqueal		6.0	6.0	9.0							0.0		(none)	0.10	r	618753.71	4846066.88	179.26
Wheel Squeal 6 4 4 8	~	RefDunmit_WSQ06	99.1	99.1	102.1	Lw	pWheelSqueal		6.0	6.0	9.0							0.0		(none)	0.10	r	618745.95	4846075.72	179.37
Wheel Squeal 7 4 4 8	~	RefDunmit_WSQ07	99.1	99.1	102.1	Lw	pWheelSqueal		6.0	6.0	9.0							0.0		(none)	0.10	r	618743.14	4846087.36	179.47
Wheel Squeal 8 1 1 5	~	RefDunmit_WSQ08	93.1	93.1	100.1	Lw	pWheelSqueal		0.0	0.0	7.0							0.0		(none)	0.10	r	618739.27	4846090.81	179.51
Wheel Squeal 9 4 4 4	~	RefDunmit_WSQ09	99.1	99.1	99.1	Lw	pWheelSqueal		6.0	6.0	6.0							0.0		(none)	0.10	r	618736.03	4846099.43	179.58
Wheel Squeal 10 4 4 4	~	RefDunmit_WSQ10	99.1	99.1	99.1	Lw	pWheelSqueal		6.0	6.0	6.0							0.0		(none)	0.10	r	618958.46	4846166.67	178.60
Wheel Squeal 11 4 4 4	~	RefDunmit_WSQ11	99.1	99.1	99.1	Lw	pWheelSqueal		6.0	6.0	6.0							0.0		(none)	0.10	r	619030.51	4845990.72	177.57
Transformer		RefD_transformer	100.6	100.6	100.6	Lw	pTransformer		0.0	0.0	0.0							0.0		(none)	3.00	r	618715.23	4845984.90	181.33
Generator1	-	RefDmit_Gen1	98.0	98.0	98.0	Lw	pGen800_1		0.0	0.0	0.0			18				0.0		(none)	3.00	r	618723.27	4845986.15	181.39
Generator2	-	RefDmit_Gen2	98.0	98.0	98.0	Lw	pGen800_2		0.0	0.0	0.0			18				0.0		(none)	3.00	r	618730.06	4845986.42	181.39
Operations AC1		RefDmit_OPCO_AC1	102.0	102.0	102.0	Lw	pOpsCo_AC1		0.0	0.0	0.0			5				0.0		(none)	1.00	g	619001.52	4845926.75	186.30
Operations AC2		RefDmit_OPCO_AC2	102.0	102.0	102.0	Lw	pOpsCo_AC2		0.0	0.0	0.0			5				0.0		(none)	1.00	g	619042.45	4845940.32	186.30
Way AC1		RefD_Way_AC1	91.6	91.6	91.6	Lw	pWay_AC1		0.0	0.0	0.0							0.0		(none)	1.00	g	618825.71	4845870.71	184.73
Way AC2		RefD_Way_AC2	83.1	83.1	83.1	Lw	pWay_AC2		0.0	0.0	0.0							0.0		(none)	1.00	g	618874.03	4845883.73	184.73
Way HV1		RefD_Way_HV1	91.4	91.4	91.4	Lw	pWay_HV1		0.0	0.0	0.0							0.0		(none)	1.00	g	618831.14	4845871.79	184.73
Way HV2		RefD_Way_HV2	82.9	82.9	82.9	Lw	pWay_HV2		0.0	0.0	0.0							0.0		(none)	1.00	g	618867.79	4845884.55	184.73
Way compressor1		RefDmit_Way_comp1	89.6	89.6	89.6	Lw	pWay_comp1		0.0	0.0	0.0			12				0.0		(none)	1.00	g	618822.00	4845880.80	184.73
Way baydoor 1		RefDmit_Way_bdoor1	103.1	106.1	106.1	Lw	pWay_Bdoor1		-3.0	0.0	0.0				30.00	60.00	0.00	3.0		(none)	3.00	r	618823.06	4845885.49	180.95
Way baydoor 2		RefD_Way_bdoor2	95.6	95.6	95.6	Lw	pWay_Bdoor2		0.0	0.0	0.0							3.0		(none)	3.00	r	618832.19	4845888.54	181.00
Way baydoor 3		RefD_Way_bdoor3	86.9	86.9	86.9	Lw	pWay_Bdoor3		0.0	0.0	0.0							3.0		(none)	3.00	r	618844.65	4845892.71	181.00
Way baydoor 4		RefD_Way_bdoor4	86.9	86.9	86.9	Lw	pWay_Bdoor4		0.0	0.0	0.0							3.0		(none)	3.00	r	618855.73	4845896.42	181.00
Way baydoor 5		RefD_Way_bdoor5	86.9	86.9	86.9	Lw	pWay_Bdoor5		0.0	0.0	0.0							3.0		(none)	3.00	r	618865.21	4845899.59	181.00
Main Shop body/paint2		RefDmit_Main_body2	86.9	86.9	83.9	Lw	pMain_Bdoor_body2		0.0	0.0	-3.0							3.0		(none)	3.00	r	618920.18	4846067.40	181.17
Main Shop undercar clean2		RefDmit_Main_clean2	97.6	97.6	94.6	Lw	pMain_Bdoor_clean2		0.0	0.0	-3.0							3.0		(none)	3.00	r	618923.41	4846057.26	181.11
Main Shop daily wash 2		RefDmit_Main_wash2	97.6	97.6	94.6	Lw	pMain_Bdoor_wash2		0.0	0.0	-3.0							3.0		(none)	3.00	r	618926.75	4846046.76	181.04
Main Shop inspection 2		RefDmit_Main_insp2	95.6	95.6	92.6	Lw	pMain_Bdoor_inspec2		0.0	0.0	-3.0							3.0		(none)	3.00	r	618929.72	4846037.45	181.00
Main Shop maintenance 2		RefDmit_Main_maint2	95.6	95.6	92.6	Lw	pMain_Bdoor_Maint2		0.0	0.0	-3.0							3.0		(none)	3.00	r	618932.04	4846030.17	181.00
Main Shop maintenance 4		RefDmit_Main_maint4	95.6	95.6	92.6	Lw	pMain_Bdoor_Maint4		0.0	0.0	-3.0							3.0		(none)	3.00	r	618934.65	4846021.99	181.00
Main Shop compressor1		RefDmit_Main_comp1	90.6	90.6	90.6	Lw	pMain_comp1		0.0	0.0	0.0			11				0.0		(none)	1.00	g	618901.14	4846075.97	193.50
Main Shop compressor2		RefDmit_Main_comp2	90.6	90.6	90.6	Lw	pMain_comp2		0.0	0.0	0.0			11				0.0		(none)	1.00	g	618853.94	4846018.52	193.50
Main Shop paint booth 1		RefD_Main_PB1	90.0	90.0	90.0	Lw	pMain_PB1		0.0	0.0	0.0							0.0		(none)	3.00	g	618862.15	4846044.51	195.50
Main Shop heating ventilation 1		RefD_Main_HV1	87.3	87.3	87.3	Lw	pMain_HV1		0.0	0.0	0.0							0.0		(none)	1.00	g	618905.56	4846079.69	193.50
Main Shop heating ventilation 2		RefD_Main_HV2	87.3	87.3	87.3	Lw	pMain_HV2		0.0	0.0	0.0							0.0		(none)	1.00	g	618876.69	4846070.85	193.50
Main Shop heating ventilation 3		RefD_Main_HV3	87.3	87.3	87.3	Lw	pMain_HV3		0.0	0.0	0.0							0.0		(none)	1.00	g	618843.08	4846059.65	193.50
Main Shop heating ventilation 4		RefD_Main_HV4	88.4	88.4	88.4	Lw	pMain_HV4		0.0	0.0	0.0							0.0		(none)	1.00	g	618849.97	4846021.52	193.50
Main Shop heating ventilation 5		RefD_Main_HV5	91.4	91.4	91.4	Lw	pMain_HV5		0.0	0.0	0.0							0.0		(none)	1.00	g	618861.61	4845986.61	193.50
Main Shop heating ventilation 6		RefD_Main_HV6	91.1	91.1	91.1	Lw	pMain_HV6		0.0	0.0	0.0							0.0		(none)	1.00	g	618899.31	4845993.72	193.50
Main Shop heating ventilation 7		RefD_Main_HV7	91.1	91.1	91.1	Lw	pMain_HV7		0.0	0.0	0.0							0.0		(none)	1.00	g	618939.17	4846002.56	193.50
Main Shop makeup air 1		RefD_Main_MAU1	88.4	88.4	88.4	Lw	pMain_MAU1		0.0	0.0	0.0							0.0		(none)	1.00	g	618872.63	4846072.78	193.50
Main Shop makeup air 2		RefD_Main_MAU2	83.4	83.4	83.4	Lw	pMain_MAU2		0.0	0.0	0.0							0.0		(none)	1.00	g	618847.64	4846026.03	193.50
Main Shop makeup air 3		RefD_Main_MAU3	85.7	85.7	85.7	Lw	pMain_MAU3		0.0	0.0	0.0							0.0		(none)	1.00	g	618906.24	4845993.93	193.50
Main Shop air condition1		RefD_Main_ac1	91.6	91.6	91.6	Lw	pMain_AC1		0.0	0.0	0.0							0.0		(none)	1.00	g	618896.91	4846073.66	193.50

Finch MSF - Reference Design Mitigated

Name	M.	ID	Result. PWL			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night						X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		(m)		(m)	(m)	(m)
Main Shop air condition2		RefD_Main_ac2	85.8	85.8	85.8	Lw	pMain_AC2		0.0	0.0	0.0							0.0		(none)	1.00	g	618838.08	4846056.56	193.50
Main Shop air condition3		RefD_Main_ac3	85.8	85.8	85.8	Lw	pMain_AC3		0.0	0.0	0.0							0.0		(none)	1.00	g	618858.95	4845980.29	193.50
Main Shop air condition4		RefD_Main_ac4	86.2	86.2	86.2	Lw	pMain_AC4		0.0	0.0	0.0							0.0		(none)	1.00	g	618933.16	4846001.16	193.50
Main Shop exhaust fan 1		RefD_Main_ef1	70.4	70.4	70.4	Lw	pMain_EF1		0.0	0.0	0.0							0.0		(none)	1.00	g	618909.12	4846071.97	193.50
Main Shop exhaust fan 2		RefD_Main_EF2	67.1	67.1	67.1	Lw	pMain_EF2		0.0	0.0	0.0							0.0		(none)	1.00	g	618893.56	4846065.81	193.50
Main Shop air condition3		RefD_Main_exhaust fan 3	66.1	66.1	66.1	Lw	pMain_EF3		0.0	0.0	0.0							0.0		(none)	1.00	g	618878.17	4846063.25	193.50
Main Shop exhaust fan 4		RefD_Main_EF4	59.6	59.6	59.6	Lw	pMain_EF4		0.0	0.0	0.0							0.0		(none)	1.00	g	618859.53	4846057.77	193.50
Main Shop exhaust fan 5		RefD_Main_EF5	59.6	59.6	59.6	Lw	pMain_EF5		0.0	0.0	0.0							0.0		(none)	1.00	g	618841.23	4846051.62	193.50
Main Shop exhaust fan 6		RefD_Main_EF6	59.6	59.6	59.6	Lw	pMain_EF6		0.0	0.0	0.0							0.0		(none)	1.00	g	618846.02	4846038.28	193.50
Main Shop exhaust fan 7		RefD_Main_EF7	75.2	75.2	75.2	Lw	pMain_EF7		0.0	0.0	0.0							0.0		(none)	1.00	g	618851.83	4846025.11	193.50
Main Shop exhaust fan 8		RefD_Main_EF8	71.5	71.5	71.5	Lw	pMain_EF8		0.0	0.0	0.0							0.0		(none)	1.00	g	618857.99	4846004.93	193.50
Main Shop exhaust fan 9		RefD_Main_EF9	59.6	59.6	59.6	Lw	pMain_EF9		0.0	0.0	0.0							0.0		(none)	1.00	g	618864.15	4845982.53	193.50
Main Shop exhaust fan 10		RefD_Main_EF10	59.6	59.6	59.6	Lw	pMain_EF10		0.0	0.0	0.0							0.0		(none)	1.00	g	618879.37	4845985.95	193.50
Main Shop exhaust fan 11		RefD_Main_EF11	59.6	59.6	59.6	Lw	pMain_EF11		0.0	0.0	0.0							0.0		(none)	1.00	g	618898.52	4845989.54	193.50
Main Shop exhaust fan 12		RefD_Main_EF12	59.6	59.6	59.6	Lw	pMain_EF12		0.0	0.0	0.0							0.0		(none)	1.00	g	618919.21	4845996.55	193.50
Main Shop exhaust fan 13		RefD_Main_EF13	81.4	81.4	81.4	Lw	pMain_EF13		0.0	0.0	0.0							0.0		(none)	1.00	g	618944.35	4846003.74	193.50
Main Shop exhaust fan 14		RefD_Main_EF14	76.4	76.4	76.4	Lw	pMain_EF14		0.0	0.0	0.0							0.0		(none)	1.00	g	618878.00	4846035.71	193.50
Main Shop exhaust fan 15		RefD_Main_EF15	81.3	81.3	81.3	Lw	pMain_EF15		0.0	0.0	0.0							0.0		(none)	1.00	g	618886.89	4846021.52	193.50
Crossover 3 31 31 76		RefDmit_cross03	103.0	103.0	106.9	Lw	pCrossover10		14.9	14.9	18.8							0.0		(none)	0.10	r	618956.89	4845941.86	177.60
Crossover 4 9 9 9		RefDmit_cross04	97.6	97.6	97.6	Lw	pCrossover10		9.5	9.5	9.5							0.0		(none)	0.10	r	618860.79	4845914.28	178.10
Crossover 5 9 9 9		RefDmit_cross05	97.6	97.6	97.6	Lw	pCrossover10		9.5	9.5	9.5							0.0		(none)	0.10	r	618847.87	4845909.54	178.10
Crossover 6 9 9 9		RefDmit_cross06	97.6	97.6	97.6	Lw	pCrossover10		9.5	9.5	9.5							0.0		(none)	0.10	r	618814.90	4845922.90	178.19
Crossover 7 9 9 9		RefDmit_cross07	97.6	97.6	97.6	Lw	pCrossover10		9.5	9.5	9.5							0.0		(none)	0.10	r	618806.71	4845932.38	178.24
Crossover 8 9 9 9		RefDmit_cross08	97.6	97.6	97.6	Lw	pCrossover10		9.5	9.5	9.5							0.0		(none)	0.10	r	618792.28	4845950.69	178.33
Crossover 9 1 1 2		RefDmit_cross09	88.1	88.1	88.1	Lw	pCrossover10		0.0	0.0	0.0							0.0		(none)	0.10	r	618787.97	4845963.83	178.41
Crossover 10 1 1 1		RefDmit_cross10	88.1	88.1	88.1	Lw	pCrossover10		0.0	0.0	0.0							0.0		(none)	0.10	r	618783.23	4845973.53	178.49
Crossover 11 0 0 0		RefDmit_cross11	88.1	88.1	88.1	Lw	pCrossover10		0.0	0.0	0.0				0.00	0.00	0.00	0.0		(none)	0.10	r	618787.75	4845974.39	178.50
Crossover 12 8 8 8		RefDmit_cross12	97.1	97.1	97.1	Lw	pCrossover10		9.0	9.0	9.0							0.0		(none)	0.10	r	618753.60	4846010.99	178.80
Crossover 13 8 8 8		RefDmit_cross13	97.1	97.1	97.1	Lw	pCrossover10		9.0	9.0	9.0							0.0		(none)	0.10	r	618749.52	4846025.65	178.92
Crossover 14 6 6 6		RefDmit_cross14	95.9	95.9	95.9	Lw	pCrossover10		7.8	7.8	7.8							0.0		(none)	0.10	r	618745.45	4846036.38	179.03
Crossover 15 4 4 4		RefDmit_cross15	94.1	94.1	94.1	Lw	pCrossover10		6.0	6.0	6.0							0.0		(none)	0.10	r	618742.05	4846047.91	179.10
Crossover 16 2 2 2		RefDmit_cross16	91.1	91.1	91.1	Lw	pCrossover10		3.0	3.0	3.0							0.0		(none)	0.10	r	618738.66	4846059.45	179.19
Crossover 17 2 2 2		RefDmit_cross17	91.1	91.1	91.1	Lw	pCrossover10		3.0	3.0	3.0							0.0		(none)	0.10	r	618772.04	4846068.54	179.17
Crossover 18 2 2 2		RefDmit_cross18	91.1	91.1	91.1	Lw	pCrossover10		3.0	3.0	3.0							0.0		(none)	0.10	r	618767.59	4846073.15	179.22
Crossover 19 2 2 2		RefDmit_cross19	91.1	91.1	91.1	Lw	pCrossover10		3.0	3.0	3.0							0.0		(none)	0.10	r	618762.81	4846088.20	179.36
Crossover 20 2 2 2		RefDmit_cross20	91.1	91.1	91.1	Lw	pCrossover10		3.0	3.0	3.0							0.0		(none)	0.10	r	618760.58	4846098.63	179.44
Wheel Squeal 2 20 20 30		RefDmit_WSQ01	101.1	101.1	102.9	Lw	pWheelSqueal		13.0	13.0	14.8			5				0.0		(none)	0.10	r	619048.22	4845975.29	177.40
Wheel Squeal 2 9 9 9		RefDmit_WSQ02	97.6	97.6	97.6	Lw	pWheelSqueal		9.5	9.5	9.5			5				0.0		(none)	0.10	r	618828.45	4845913.48	178.13
Wheel Squeal 3 0 0 0		RefDmit_WSQ03	88.1	88.1	91.1	Lw	pWheelSqueal		0.0	0.0	3.0			5	0.00	0.00	0.00	0.0		(none)	0.10	r	618758.02	4846046.19	179.10
Wheel Squeal 4 2 2 2		RefDmit_WSQ04	91.1	91.1	91.1	Lw	pWheelSqueal		3.0	3.0	3.0			5				0.0		(none)	0.10	r	618756.52	4846058.19	179.19
Wheel Squeal 5 2 2 2		RefDmit_WSQ05	91.1	91.1	91.1	Lw	pWheelSqueal		3.0	3.0	3.0			5				0.0		(none)	0.10	r	618753.71	4846066.88	179.26
Wheel Squeal 6 2 2 2		RefDmit_WSQ06	91.1	91.1	91.1	Lw	pWheelSqueal		3.0	3.0	3.0			5				0.0		(none)	0.10	r	618745.95	4846075.72	179.37
Wheel Squeal 7 2 2 2		RefDmit_WSQ07	91.1	91.1	91.1	Lw	pWheelSqueal		3.0	3.0	3.0			5				0.0		(none)	0.10	r	618743.14	4846087.36	179.47
Wheel Squeal 8 0 0 0		RefDmit_WSQ08	88.1	88.1	91.1	Lw	pWheelSqueal		0.0	0.0	3.0			5	0.00	0.00	0.00	0.0		(none)	0.10	r	618739.27	4846090.81	179.51
Wheel Squeal 9 4 4 4		RefDmit_WSQ09	94.1	94.1	94.1	Lw	pWheelSqueal		6.0	6.0	6.0			5				0.0		(none)	0.10	r	618736.03	4846099.43	179.58
Wheel Squeal 10 4 4 4		RefDmit_WSQ10	94.1	94.1	94.1	Lw	pWheelSqueal		6.0	6.0	6.0			5				0.0		(none)	0.10	r	618958.46	4846166.67	178.60
Wheel Squeal 11 4 4 4		RefDmit_WSQ11	94.1	94.1	94.1	Lw	pWheelSqueal		6.0	6.0	6.0			5				0.0		(none)	0.10	r	619026.70	4845990.58	177.58
Crossover 21 11 11 21		RefDmit_cross21	98.5	98.5	101.2	Lw	pCrossover10		10.4	10.4	13.1							0.0		(none)	0.10	r	618982.75	4845959.03	177.54
Crossover 22 11 11 21		RefDmit_cross22	98.5	98.5	101.3	Lw	pCrossover10		10.4	10.4	13.2							0.0		(none)	0.10	r	619008.09	4845988.36	177.62
Crossover 23 11 11 21		RefDmit_cross23	98.5	98.5	101.3	Lw	pCrossover10		10.4	10.4	13.2							0.0		(none)	0.10	r	619008.36	4846001.67	177.73
Crossover 25 1 1 1		RefDmit_cross25	88.1	88.1	88.1	Lw	pCrossover10		0.0	0.0	0.0							0.0		(none)	0.10	r	619001.57	4846033.17	178.01
Crossover 24 11 11 21		RefDmit_cross24	98.5	98.5	101.3	Lw	pCrossover10		10.4	10.4	13.2							0.0		(none)	0.10	r	619009.18	4846013.89	177.83
Crossover 26 1 1 1		RefDmit_cross26	88.1	88.1	88.1	Lw	pCrossover10		0.0	0.0	0.0							0.0		(none)	0.10	r	619005.65	4846024.89	177.93
Crossover 27 10 10 20		RefDmit_cross27	98.1	98.1	101.1	Lw	pCrossover10		10.0	10.0	13.0							0.0		(none)	0.10	r	618993.97	4846076.09	178.10
Crossover 28 10 10 20		RefDmit_cross28	98.1	98.1	101.1	Lw	pCrossover10		10.0	10.0	13.0							0.0		(none)	0.10	r	618989.35	4846089.40	178.10
Crossover 29 9 9 18		RefDmit_cross29	97.6	97.6	100.7	Lw	pCrossover10		9.5	9.5	12.6							0.0		(none)	0.10	r	618983.65	4846102.70	178.17
Crossover 30 7 7 14		RefDmit_cross30	96.6	96.6	99.6	Lw	pCrossover10		8.5	8.5	11.5							0.0		(none)	0.10	r	618978.76	4846113.84	178.24
Crossover 31 5 5 10		RefDmit_cross31	95.1	95.1	98.1	Lw	pCrossover10		7.0	7.0	10.0							0.0		(none)	0.10	r	618974.14	4846125.52	178.30
Crossover 32 3 3 6		RefDmit_cross32	92.9	92.9	95.9	Lw	pCrossover10		4.8	4.8	7.8							0.0		(none)	0.10	r	618970.07	4846136.38	178.37
Crossover 33 2 2 4		RefDmit_cross33	91.1	91.1	94.1	Lw	pCrossover10		3.0	3.0	6.0							0.0		(none)	0.10	r	618940.00	4846122.11	178.41
Crossover 34 2 2 4		RefDmit_cross34	91.1	91.1	94.1	Lw	pCrossover10		3.0	3.0	6.0							0.0		(none)	0.10	r	618939.46	4846128.08	178.45
Crossover 35 2 2 4		RefDmit_cross35	91.1	91.1	94.1	Lw	pCrossover10		3.0	3.0	6.0							0.0		(none)	0.10	r	618934.43	4846143.97	178.57
Crossover 36 2 2 4		RefDmit_cross36	91.1	91.1	94.1	Lw	pCrossover10		3.0	3.0	6.0							0.0		(none)	0.10	r	618928.87	4846152.39	178.65
Wheel Squeal 12 11 11 21		RefDmit_WSQ12	98.5	98.5	101.3	Lw	pWheelSqueal		10.4	10.4	13.2			5				0.0		(none)	0.10	r	619002.41	4845971.59	177.49
Wheel Squeal 13 1 1 2		RefDmit_WSQ13	88.1	88.1	91.1	Lw	pWheelSqueal		0.0	0.0	3.0			5				0.0		(none)	0.10	r	618963.73	4846113.62	178.26
Wheel Squeal 14 2 2 4		RefDmit_WSQ14	91.1	91.1	94.1	Lw	pWheelSqueal		3.0	3.0	6.0			5				0.0		(none)	0.10	r	618960.74	4846123.88	178.33
Wheel Squeal 15 2 2 4		RefDmit_WSQ15	91.1	91.1	94.1	Lw	pWheelSqueal		3.0	3.0	6.0			5				0.0		(none)	0.10	r	618958.81	4846130.04	178.38
Wheel Squeal 16 2 2 4		RefDmit_WSQ16	91.1	91.1	94.1	Lw	pWheelSqueal		3.0	3.0	6.0			5				0.0		(none)	0.10	r	618954.11	4846144.07	178.48
Wheel Squeal 17 2 2 4		RefDmit_WSQ17	91.1	91.1	94.1	Lw	pWheelSqueal		3.0	3.0	6.0			5				0.0		(none)	0.10	r	618949.74	4846154.34	178.57
Wheel Squeal 17 1 1 2		RefDmit_WSQ17	88.1	88.1	91.1	Lw	pWheelSqueal		0.0	0.0	3.0			5				0.0		(none)	0.10	r	618949.74	4846160.58	178.60
Main Shop maintenance 3		RefDmit_Main_maint3	100.1	100.1	100.1	Lw	pMain_Bdoor_Maint3		0.0	0.0	0.0			6	60.00	60.00	0.00	3.0		(none)	3.00	r	618851.56	4845994.76	181.46

Finch MSF - Reference Design Mitigated

Name	M.	ID	Result. PWL			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night						X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		(m)		(m)	(m)	(m)
Main Shop maintenance 1		RefDmit_Main_maint1	100.1	100.1	100.1	Lw	pMain_Bdoor_Maint1		0.0	0.0	0.0			6	60.00	60.00	0.00	3.0		(none)	3.00	r	618849.01	4846002.86	181.54
Main Shop inspection 1		RefDmit_Main_insp1	100.1	100.1	100.1	Lw	pMain_Bdoor_inspec1		0.0	0.0	0.0			6	60.00	60.00	0.00	3.0		(none)	3.00	r	618846.21	4846011.70	181.62
Main Shop daily wash 1		RefDmit_Main_wash1	91.6	91.6	91.6	Lw	pMain_Bdoor_wash1		0.0	0.0	0.0			6	60.00	60.00	0.00	3.0		(none)	3.00	r	618843.53	4846020.19	181.69
Main Shop undercar clean1		RefDmit_Main_clean1	91.6	91.6	91.6	Lw	pMain_Bdoor_clean1		0.0	0.0	0.0			6	60.00	60.00	0.00	3.0		(none)	3.00	r	618840.34	4846030.31	181.78
Main Shop body/paint1		RefDmit_Main_body1	100.1	100.1	100.1	Lw	pMain_Bdoor_body1		0.0	0.0	0.0			6	60.00	60.00	0.00	3.0		(none)	3.00	r	618837.12	4846040.50	181.84
	~	ROW_cross1	105.9	105.9	104.5	Lw	pCrossover60_noPen		14.4	14.4	13.0							0.0		(none)	0.50	r	619061.21	4845913.95	177.50
	~	ROW_cross2	105.9	105.9	104.5	Lw	pCrossover60_noPen		14.4	14.4	13.0							0.0		(none)	0.50	r	619114.05	4845932.11	177.57
	~	ROW_cross3	97.6	97.6	98.4	Lw	pCrossover_noPen		9.7	9.7	10.5							0.0		(none)	0.50	r	619075.36	4845950.09	177.62
wheel squeal 1 - half total deploy/return	~	ROW_squeal1	99.8	99.8	100.6	Lw	pWheelSqueal_nopen		6.7	6.7	7.5							0.0		(none)	0.50	r	619071.67	4845929.07	177.50
wheel squeal 2 - half total deploy/return	~	ROW_squeal2	99.8	99.8	100.6	Lw	pWheelSqueal_nopen		6.7	6.7	7.5							0.0		(none)	0.50	r	619100.43	4845935.40	177.55
	~	ROW_squeal3	102.8	102.8	103.6	Lw	pWheelSqueal_nopen		9.7	9.7	10.5							0.0		(none)	0.50	r	619061.39	4845975.80	177.81

Line Sources

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src			
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number			Speed
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night	(km/h)
Onsite LRT movements 1	~	OPT1unmit_OnsiteLRT1	101.8	101.8	105.7	73.0	73.0	77.0	PWL-Pt	pLRTmovement20		0.0	0.0	0.0							0.0		(none)	20.0	20.0	50.0	20.0
Onsite LRT movements 1	~	OPT1mit_OnsiteLRT1	98.7	98.7	100.5	70.0	70.0	71.8	PWL-Pt	pLRTmovement20		0.0	0.0	0.0							0.0		(none)	10.0	10.0	15.0	20.0
LRT brake test part 1	~	OPT1_braketestP1	88.1	88.1	88.1	66.1	66.1	66.1	PWL-Pt	pLRTmovement20		0.0	0.0	0.0							0.0		(none)	4.0	4.0	4.0	20.0
LRT brake test squeal 4 4 4	~	OPT1_braketestP2	99.1	99.1	99.1	81.2	81.2	81.2	Lw	pWheelSqueal		6.0	6.0	6.0							0.0		(none)				
LRT brake test part 3	~	OPT1_braketestP3	83.6	83.6	83.6	66.1	66.1	66.1	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	4.0	4.0	4.0	20.0
Onsite LRT movements 1	~	OPT2unmit_OnsiteLRT1	102.0	102.0	106.0	73.0	73.0	77.0	PWL-Pt	pLRTmovement20		0.0	0.0	0.0							0.0		(none)	20.0	20.0	50.0	20.0
Onsite LRT movements 1	~	OPT2mit_OnsiteLRT1	99.0	99.0	100.8	70.0	70.0	71.8	PWL-Pt	pLRTmovement20		0.0	0.0	0.0							0.0		(none)	10.0	10.0	15.0	20.0
LRT brake test part 1	~	OPT2_braketestP1	88.1	88.1	88.1	66.1	66.1	66.1	PWL-Pt	pLRTmovement20		0.0	0.0	0.0							0.0		(none)	4.0	4.0	4.0	20.0
LRT brake test squeal 4 4 4	~	OPT2_braketestP2	99.1	99.1	99.1	81.2	81.2	81.2	Lw	pWheelSqueal		6.0	6.0	6.0							0.0		(none)				
LRT brake test part 3	~	OPT2_braketestP3	83.6	83.6	83.6	66.1	66.1	66.1	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	4.0	4.0	4.0	20.0
Onsite LRT movements 1	~	OPT3unmit_OnsiteLRT1	102.0	102.0	106.0	73.0	73.0	77.0	PWL-Pt	pLRTmovement20		0.0	0.0	0.0							0.0		(none)	20.0	20.0	50.0	20.0
Onsite LRT movements 1	~	OPT3mit_OnsiteLRT1	96.0	96.0	97.8	67.0	67.0	68.8	PWL-Pt	pLRTmovement10		0.0	0.0	0.0							0.0		(none)	10.0	10.0	15.0	10.0
LRT brake test part 1	~	OPT3_braketestP1	88.1	88.1	88.1	66.1	66.1	66.1	PWL-Pt	pLRTmovement20		0.0	0.0	0.0							0.0		(none)	4.0	4.0	4.0	20.0
LRT brake test squeal 4 4 4	~	OPT3_braketestP2	99.1	99.1	99.1	81.2	81.2	81.2	Lw	pWheelSqueal		6.0	6.0	6.0							0.0		(none)				
LRT brake test part 3	~	OPT3_braketestP3	83.6	83.6	83.6	66.1	66.1	66.1	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	4.0	4.0	4.0	20.0
Onsite LRT movements 1	~	OPT4unmit_OnsiteLRT1	102.1	102.1	106.0	73.0	73.0	77.0	PWL-Pt	pLRTmovement20		0.0	0.0	0.0							0.0		(none)	20.0	20.0	50.0	20.0
Onsite LRT movements 1	~	OPT4mit_OnsiteLRT1	96.0	96.0	97.8	67.0	67.0	68.8	PWL-Pt	pLRTmovement10		0.0	0.0	0.0							0.0		(none)	10.0	10.0	15.0	10.0
LRT brake test part 1	~	OPT4_braketestP1	88.1	88.1	88.1	66.1	66.1	66.1	PWL-Pt	pLRTmovement20		0.0	0.0	0.0							0.0		(none)	4.0	4.0	4.0	20.0
LRT brake test squeal 4 4 4	~	OPT4_braketestP2	99.1	99.1	99.1	81.2	81.2	81.2	Lw	pWheelSqueal		6.0	6.0	6.0							0.0		(none)				
LRT brake test part 3	~	OPT4_braketestP3	83.6	83.6	83.6	66.1	66.1	66.1	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	4.0	4.0	4.0	20.0
LRT movements south part 1	~	refdunmit_LRTs1	93.3	93.3	97.2	73.0	73.0	77.0	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	20.0	20.0	50.0	20.0
LRT movements south part 2	~	refdunmit_LRTs2	93.0	93.0	97.0	73.0	73.0	77.0	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	20.0	20.0	50.0	20.0
LRT MOVEMENTS west PART 1	~	REFDUNMIT_LRTW01	92.4	92.4	96.4	73.0	73.0	77.0	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	20.0	20.0	50.0	20.0
LRT MOVEMENTS west PART 2	~	REFDUNMIT_LRTW02	73.7	73.7	79.7	63.0	63.0	69.1	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	2.0	2.0	8.0	20.0
LRT MOVEMENTS west PART 3	~	REFDUNMIT_LRTW03	69.4	69.4	75.4	60.0	60.0	66.1	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	1.0	1.0	4.0	20.0
LRT MOVEMENTS west PART 4	~	REFDUNMIT_LRTW04	68.9	68.9	74.9	60.0	60.0	66.1	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	1.0	1.0	4.0	20.0
LRT MOVEMENTS west PART 5	~	REFDUNMIT_LRTW05	78.2	78.2	81.2	60.0	60.0	63.0	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	1.0	1.0	2.0	20.0
LRT MOVEMENTS west PART 6	~	REFDUNMIT_LRTW06	-21.9	-21.9	81.1	-40.0	-40.0	63.0	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	0.0	0.0	2.0	20.0
LRT MOVEMENTS west PART 7	~	REFDUNMIT_LRTW07	78.1	78.1	81.1	60.0	60.0	63.0	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	1.0	1.0	2.0	20.0
LRT MOVEMENTS west PART 8	~	REFDUNMIT_LRTW08	-22.0	-22.0	81.0	-40.0	-40.0	63.0	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	0.0	0.0	2.0	20.0
LRT MOVEMENTS west PART 9	~	REFDUNMIT_LRTW09	90.9	90.9	94.6	72.6	72.6	76.3	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	18.0	18.0	42.0	20.0
LRT MOVEMENTS west PART 10	~	REFDUNMIT_LRTW10	82.9	82.9	86.6	72.3	72.3	76.1	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	17.0	17.0	40.0	20.0
LRT MOVEMENTS west PART 11	~	REFDUNMIT_LRTW11	80.5	80.5	84.4	71.2	71.2	75.1	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	13.0	13.0	32.0	20.0
LRT MOVEMENTS west PART 12	~	REFDUNMIT_LRTW12	78.9	78.9	83.2	69.6	69.6	73.8	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	9.0	9.0	24.0	20.0
LRT MOVEMENTS west PART 13	~	REFDUNMIT_LRTW13	76.5	76.5	81.5	67.0	67.0	72.1	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	5.0	5.0	16.0	20.0
LRT MOVEMENTS west PART 14	~	REFDUNMIT_LRTW14	82.7	82.7	89.7	60.0	60.0	67.0	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	1.0	1.0	5.0	20.0
LRT MOVEMENTS west PART 15	~	REFDUNMIT_LRTW15	82.9	82.9	85.9	66.1	66.1	69.1	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	4.0	4.0	8.0	20.0
LRT MOVEMENTS west PART 16	~	REFDUNMIT_LRTW16	82.2	82.2	85.2	66.1	66.1	69.1	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	4.0	4.0	8.0	20.0
LRT MOVEMENTS west PART 17	~	REFDUNMIT_LRTW17	82.1	82.1	85.1	66.1	66.1	69.1	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	4.0	4.0	8.0	20.0
LRT MOVEMENTS west PART 18	~	REFDUNMIT_LRTW18	82.5	82.5	85.5	66.1	66.1	69.1	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	4.0	4.0	8.0	20.0
LRT MOVEMENTS west PART 19	~	REFDUNMIT_LRTW19	83.9	83.9	86.9	63.0	63.0	66.1	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	2.0	2.0	4.0	20.0
LRT MOVEMENTS west PART 20	~	REFDUNMIT_LRTW20	83.9	83.9	86.9	63.0	63.0	66.1	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	2.0	2.0	4.0	20.0
LRT MOVEMENTS west PART 21	~	REFDUNMIT_LRTW21	84.0	84.0	87.1	63.0	63.0	66.1	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	2.0	2.0	4.0	20.0
LRT MOVEMENTS west PART 22	~	REFDUNMIT_LRTW22	84.0	84.0	87.0	63.0	63.0	66.1	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	2.0	2.0	4.0	20.0
LRT MOVEMENTS west PART 23	~	REFDUNMIT_LRTW23	84.2	84.2	87.2	63.0	63.0	66.1	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	2.0	2.0	4.0	20.0
LRT MOVEMENTS west PART 24	~	REFDUNMIT_LRTW24	84.0	84.0	87.0	63.0	63.0	66.1	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	2.0	2.0	4.0	20.0
LRT MOVEMENTS west PART 25	~	REFDUNMIT_LRTW25	83.9	83.9	86.9	63.0	63.0	66.1	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	2.0	2.0	4.0	20.0
LRT MOVEMENTS west PART 26	~	REFDUNMIT_LRTW26	83.7	83.7	86.7	63.0	63.0	66.1	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	2.0	2.0	4.0	20.0
LRT MOVEMENTS west PART 27	~	REFDUNMIT_LRTW27	83.5	83.5	90.5	60.0	60.0	67.0	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	1.0	1.0	5.0	20.0
LRT brake test part 1		refd_braketest1	90.1	90.1	90.1	66.1	66.1	66.1	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	4.0	4.0	4.0	20.0
LRT brake test part 2 4 4 4		refd_braketest2	99.1	99.1	99.1	79.7	79.7	79.7	Lw	pWheelSqueal		6.0	6.0	6.0							0.0		(none)				
LRT brake test part 3		refd_braketest3	91.6	91.6	91.6	66.1	66.1	66.1	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	4.0	4.0	4.0	20.0
LRT movements south part 1		refdmit_LRTs1	93.0	93.0	94.8	73.0	73.0	74.8	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	20.0	20.0	30.0	20.0

Finch MSF - Reference Design Mitigated

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src			
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number			Speed
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night	(km/h)
LRT movements south part 2		refdmit_LRTs2	94.9	94.9	97.1	74.9	74.9	77.1	PWL-Pt	pLRTmovement20		6.0	6.0	6.0							0.0		(none)	31.0	31.0	51.0	20.0
LRT MOVEMENTS west PART 1		REFDMIT_LRTW01	85.9	85.9	85.9	66.6	66.6	66.6	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	9.0	9.0	9.0	10.0
LRT MOVEMENTS west PART 2		REFDmit_LRTW02	67.7	67.7	67.7	57.0	57.0	57.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	1.0	1.0	1.0	10.0
LRT MOVEMENTS west PART 3		REFDmit_LRTW03	66.3	66.3	66.3	57.0	57.0	57.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	1.0	1.0	1.0	10.0
LRT MOVEMENTS west PART 4		REFDmit_LRTW04	-34.1	-34.1	-34.1	-43.0	-43.0	-43.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	0.0	0.0	0.0	10.0
LRT MOVEMENTS west PART 5		REFDmit_LRTW05	75.2	75.2	75.2	57.0	57.0	57.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	1.0	1.0	1.0	10.0
LRT MOVEMENTS west PART 6		REFDmit_LRTW06	-24.9	-24.9	-24.9	-43.0	-43.0	-43.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	0.0	0.0	0.0	10.0
LRT MOVEMENTS west PART 7		REFDmit_LRTW07	-24.9	-24.9	-24.9	-43.0	-43.0	-43.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	0.0	0.0	0.0	10.0
LRT MOVEMENTS west PART 8		REFDmit_LRTW08	-25.1	-25.1	-25.1	-43.0	-43.0	-43.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	0.0	0.0	0.0	10.0
LRT MOVEMENTS west PART 9		REFDmit_LRTW09	84.4	84.4	84.4	66.1	66.1	66.1	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	8.0	8.0	8.0	10.0
LRT MOVEMENTS west PART 10		REFDmit_LRTW10	76.6	76.6	76.6	66.1	66.1	66.1	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	8.0	8.0	8.0	10.0
LRT MOVEMENTS west PART 11		REFDmit_LRTW11	74.2	74.2	74.2	64.8	64.8	64.8	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	6.0	6.0	6.0	10.0
LRT MOVEMENTS west PART 12		REFDmit_LRTW12	72.4	72.4	72.4	63.0	63.0	63.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	4.0	4.0	4.0	10.0
LRT MOVEMENTS west PART 13		REFDmit_LRTW13	69.5	69.5	69.5	60.0	60.0	60.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	2.0	2.0	2.0	10.0
LRT MOVEMENTS west PART 14		REFDmit_LRTW14	-21.4	-21.4	-21.4	-43.0	-43.0	-43.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	0.0	0.0	0.0	10.0
LRT MOVEMENTS west PART 15		REFDmit_LRTW15	79.9	79.9	79.9	63.0	63.0	63.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	4.0	4.0	4.0	10.0
LRT MOVEMENTS west PART 16		REFDmit_LRTW16	79.2	79.2	79.2	63.0	63.0	63.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	4.0	4.0	4.0	10.0
LRT MOVEMENTS west PART 17		REFDmit_LRTW17	79.1	79.1	79.1	63.0	63.0	63.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	4.0	4.0	4.0	10.0
LRT MOVEMENTS west PART 18		REFDmit_LRTW18	79.5	79.5	79.5	63.0	63.0	63.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	4.0	4.0	4.0	10.0
LRT MOVEMENTS west PART 19		REFDmit_LRTW19	76.1	76.1	76.1	57.0	57.0	57.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	1.0	1.0	1.0	10.0
LRT MOVEMENTS west PART 20		REFDmit_LRTW20	76.0	76.0	76.0	57.0	57.0	57.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	1.0	1.0	1.0	10.0
LRT MOVEMENTS west PART 21		REFDmit_LRTW21	76.2	76.2	76.2	57.0	57.0	57.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	1.0	1.0	1.0	10.0
LRT MOVEMENTS west PART 22		REFDmit_LRTW22	76.2	76.2	76.2	57.0	57.0	57.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	1.0	1.0	1.0	10.0
LRT MOVEMENTS west PART 23		REFDmit_LRTW23	76.3	76.3	76.3	57.0	57.0	57.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	1.0	1.0	1.0	10.0
LRT MOVEMENTS west PART 24		REFDmit_LRTW24	76.1	76.1	76.1	57.0	57.0	57.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	1.0	1.0	1.0	10.0
LRT MOVEMENTS west PART 25		REFDmit_LRTW25	76.0	76.0	76.0	57.0	57.0	57.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	1.0	1.0	1.0	10.0
LRT MOVEMENTS west PART 26		REFDmit_LRTW26	75.8	75.8	75.8	57.0	57.0	57.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	1.0	1.0	1.0	10.0
LRT MOVEMENTS west PART 27		REFDmit_LRTW27	-22.6	-22.6	-22.6	-43.0	-43.0	-43.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	0.0	0.0	0.0	10.0
LRT MOVEMENTS east PART 1		REFDmit_LRTE01	87.4	87.4	90.2	67.4	67.4	70.2	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	11.0	11.0	21.0	10.0
LRT MOVEMENTS east PART 2		REFDmit_LRTE02	70.2	70.2	70.2	57.0	57.0	57.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	1.0	1.0	1.0	10.0
LRT MOVEMENTS east PART 3		REFDmit_LRTE03	75.1	75.1	75.1	57.0	57.0	57.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	1.0	1.0	1.0	10.0
LRT MOVEMENTS east PART 4		REFDmit_LRTE04	-24.5	-24.5	-24.5	-43.0	-43.0	-43.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	0.0	0.0	0.0	10.0
LRT MOVEMENTS east PART 5		REFDmit_LRTE05	85.8	85.8	88.8	67.0	67.0	70.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	10.0	10.0	20.0	10.0
LRT MOVEMENTS east PART 6		REFDmit_LRTE06	76.8	76.8	79.8	66.6	66.6	69.6	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	9.0	9.0	18.0	10.0
LRT MOVEMENTS east PART 7		REFDmit_LRTE07	74.7	74.7	77.7	65.5	65.5	68.5	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	7.0	7.0	14.0	10.0
LRT MOVEMENTS east PART 8		REFDmit_LRTE08	73.7	73.7	76.7	64.0	64.0	67.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	5.0	5.0	10.0	10.0
LRT MOVEMENTS east PART 8		REFDmit_LRTE08	71.2	71.2	74.9	61.8	61.8	65.5	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	3.0	3.0	7.0	10.0
LRT MOVEMENTS east PART 9		REFDmit_LRTE09	78.5	78.5	81.5	57.0	57.0	60.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	1.0	1.0	2.0	10.0
LRT MOVEMENTS east PART 10		REFDmit_LRTE10	76.7	76.7	79.7	60.0	60.0	63.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	2.0	2.0	4.0	10.0
LRT MOVEMENTS east PART 11		REFDmit_LRTE11	76.0	76.0	79.0	60.0	60.0	63.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	2.0	2.0	4.0	10.0
LRT MOVEMENTS east PART 12		REFDmit_LRTE12	75.8	75.8	78.8	60.0	60.0	63.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	2.0	2.0	4.0	10.0
LRT MOVEMENTS east PART 13		REFDmit_LRTE13	76.2	76.2	79.2	60.0	60.0	63.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	2.0	2.0	4.0	10.0
LRT MOVEMENTS east PART 14		REFDmit_LRTE14	75.7	75.7	78.7	57.0	57.0	60.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	1.0	1.0	2.0	10.0
LRT MOVEMENTS east PART 15		REFDmit_LRTE15	75.4	75.4	78.4	57.0	57.0	60.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	1.0	1.0	2.0	10.0
LRT MOVEMENTS east PART 16		REFDmit_LRTE16	75.8	75.8	78.8	57.0	57.0	60.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	1.0	1.0	2.0	10.0
LRT MOVEMENTS east PART 17		REFDmit_LRTE17	75.8	75.8	78.8	57.0	57.0	60.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	1.0	1.0	2.0	10.0
LRT MOVEMENTS east PART 18		REFDmit_LRTE18	75.9	75.9	78.9	57.0	57.0	60.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	1.0	1.0	2.0	10.0
LRT MOVEMENTS east PART 19		REFDmit_LRTE19	75.8	75.8	78.8	57.0	57.0	60.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	1.0	1.0	2.0	10.0
LRT MOVEMENTS east PART 20		REFDmit_LRTE20	75.6	75.6	78.7	57.0	57.0	60.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	1.0	1.0	2.0	10.0
LRT MOVEMENTS east PART 21		REFDmit_LRTE21	75.6	75.6	78.6	57.0	57.0	60.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	1.0	1.0	2.0	10.0
LRT MOVEMENTS east PART 22		REFDmit_LRTE22	79.1	79.1	82.1	57.0	57.0	60.0	PWL-Pt	pLRTmovement10		6.0	6.0	6.0							0.0		(none)	1.0	1.0	2.0	10.0

Area Sources

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night
Main Shop Heating Ventilation 1	~	OPT1_Main_HV1	87.3	87.3	87.3	48.8	48.8	48.8	Lw	pMain_HV1		0.0	0.0	0.0							0.0		(none)			
Main Shop Heating Ventilation 2	~	OPT1_Main_HV2	87.3	87.3	87.3	48.8	48.8	48.8	Lw	pMain_HV2		0.0	0.0	0.0							0.0		(none)			
Main Shop Heating Ventilation 3	~	OPT1_Main_HV3	87.3	87.3	87.3	48.8	48.8	48.8	Lw	pMain_HV3		0.0	0.0	0.0							0.0		(none)			
Main Shop Heating Ventilation 4	~	OPT1_Main_HV4	88.4	88.4	88.4	49.8	49.8	49.8	Lw	pMain_HV4		0.0	0.0	0.0							0.0		(none)			
Main Shop Heating Ventilation 5	~	OPT1_Main_HV5	91.4	91.4	91.4	52.9	52.9	52.9	Lw	pMain_HV5		0.0	0.0	0.0							0.0		(none)			
Main Shop Heating Ventilation 6	~	OPT1_Main_HV6	91.1	91.1	91.1	52.5	52.5	52.5	Lw	pMain_HV6		0.0	0.0	0.0							0.0		(none)			
Main Shop Heating Ventilation 7	~	OPT1_Main_HV7	91.1	91.1	91.1	52.5	52.5	52.5	Lw	pMain_HV7		0.0	0.0	0.0							0.0		(none)			
Main Shop Makeup air 1	~	OPT1_Main_MAU1	88.4	88.4	88.4	49.8	49.8	49.8	Lw	pMain_MAU1		0.0	0.0	0.0							0.0		(none)			
Main Shop Makeup air 2	~	OPT1_Main_MAU2	83.4	83.4	83.4	44.9	44.9	44.9	Lw	pMain_MAU2		0.0	0.0	0.0							0.0		(none)			
Main Shop Makeup air 3	~	OPT1_Main_MAU3	85.7	85.7	85.7	47.2	47.2	47.2	Lw	pMain_MAU3		0.0	0.0	0.0							0.0		(none)			
Operations Company Air Conditioning 1	~	OPT1unmit_OpsCo_AC1	107.0	107.0	107.0	68.4	68.4	68.4	Lw	pOpsCo_AC1		0.0	0.0	0.0							0.0		(none)			
Operations Company Air Conditioning 2	~	OPT1unmit_OpsCo_AC2	107.0	107.0	107.0	68.4	68.4	68.4	Lw	pOpsCo_AC2		0.0	0.0	0.0							0.0		(none)			
Operations Company Air Conditioning 1	~	OPT1mit_OpsCo_AC1	87.0	87.0	87.0	48.4	48.4	48.4	Lw	pOpsCo_AC1		0.0	0.0	0.0			20				0.0		(none)			

Finch MSF - Reference Design Mitigated

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night
Operations Company Air Conditioning 2	~	OPT1mit_OpsCo_AC2	87.0	87.0	87.0	48.4	48.4	48.4	Lw	pOpsCo_AC2		0.0	0.0	0.0			20				0.0		(none)			
Main Shop Air conditioning 1	~	OPT1_Main_AC1	91.6	91.6	91.6	53.1	53.1	53.1	Lw	pMain_AC1		0.0	0.0	0.0							0.0		(none)			
Main Shop Air conditioning 2	~	OPT1_Main_AC2	85.8	85.8	85.8	47.3	47.3	47.3	Lw	pMain_AC2		0.0	0.0	0.0							0.0		(none)			
Main Shop Air conditioning 3	~	OPT1_Main_AC3	85.8	85.8	85.8	47.3	47.3	47.3	Lw	pMain_AC3		0.0	0.0	0.0							0.0		(none)			
Main Shop Air conditioning 4	~	OPT1_Main_AC4	86.2	86.2	86.2	47.6	47.6	47.6	Lw	pMain_AC4		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 1	~	OPT1_Main_EF01	70.4	70.4	70.4	31.8	31.8	31.8	Lw	pMain_EF1		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 2	~	OPT1_Main_EF02	67.1	67.1	67.1	28.5	28.5	28.5	Lw	pMain_EF2		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 3	~	OPT1_Main_EF03	66.1	66.1	66.1	27.6	27.6	27.6	Lw	pMain_EF3		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 4	~	OPT1_Main_EF04	59.6	59.6	59.6	21.0	21.0	21.0	Lw	pMain_EF4		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 5	~	OPT1_Main_EF05	59.6	59.6	59.6	21.0	21.0	21.0	Lw	pMain_EF5		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 6	~	OPT1_Main_EF06	59.6	59.6	59.6	21.0	21.0	21.0	Lw	pMain_EF6		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 7	~	OPT1_Main_EF07	75.2	75.2	75.2	36.6	36.6	36.6	Lw	pMain_EF7		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 8	~	OPT1_Main_EF08	71.5	71.5	71.5	33.0	33.0	33.0	Lw	pMain_EF8		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 9	~	OPT1_Main_EF09	59.6	59.6	59.6	21.0	21.0	21.0	Lw	pMain_EF9		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 10	~	OPT1_Main_EF10	59.6	59.6	59.6	21.0	21.0	21.0	Lw	pMain_EF10		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 11	~	OPT1_Main_EF11	59.6	59.6	59.6	21.0	21.0	21.0	Lw	pMain_EF11		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 12	~	OPT1_Main_EF12	59.6	59.6	59.6	21.0	21.0	21.0	Lw	pMain_EF12		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 13	~	OPT1_Main_EF13	81.4	81.4	81.4	42.8	42.8	42.8	Lw	pMain_EF13		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 14	~	OPT1_Main_EF14	76.4	76.4	76.4	37.9	37.9	37.9	Lw	pMain_EF14		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 15	~	OPT1_Main_EF15	81.3	81.3	81.3	42.7	42.7	42.7	Lw	pMain_EF15		0.0	0.0	0.0							0.0		(none)			
Wayside Air Conditioning 1	~	OPT1_Way_AC1	91.6	91.6	91.6	53.1	53.1	53.1	Lw	pWay_AC1		0.0	0.0	0.0							0.0		(none)			
Wayside Air Conditioning 2	~	OPT1_Way_AC2	83.1	83.1	83.1	44.5	44.5	44.5	Lw	pWay_AC2		0.0	0.0	0.0							0.0		(none)			
Wayside Heating Ventilation 1	~	OPT1_Way_HV1	91.4	91.4	91.4	52.9	52.9	52.9	Lw	pWay_HV1		0.0	0.0	0.0							0.0		(none)			
Wayside Heating Ventilation 2	~	OPT1_Way_HV2	82.9	82.9	82.9	44.3	44.3	44.3	Lw	pWay_HV2		0.0	0.0	0.0							0.0		(none)			
Main Shop Paint Booth 1	~	OPT1_Main_PB1	90.0	90.0	90.0	51.4	51.4	51.4	Lw	pMain_PB1		0.0	0.0	0.0							0.0		(none)			
Main Shop Compressor 1	~	OPT1unmit_Main_Comp1	101.6	101.6	101.6	63.0	63.0	63.0	Lw	pMain_comp1		0.0	0.0	0.0							0.0		(none)			
Main Shop Compressor 2	~	OPT1unmit_Main_Comp2	101.6	101.6	101.6	63.0	63.0	63.0	Lw	pMain_Comp2		0.0	0.0	0.0							0.0		(none)			
Wayside Compressor 1	~	OPT1unmit_Way_comp1	101.6	101.6	101.6	63.0	63.0	63.0	Lw	pWay_comp1		0.0	0.0	0.0							0.0		(none)			
Main Shop Compressor 1	~	OPT1mit_Main_Comp1	86.6	86.6	86.6	48.0	48.0	48.0	Lw	pMain_comp1		0.0	0.0	0.0			15				0.0		(none)			
Main Shop Compressor 2	~	OPT1mit_Main_Comp2	86.6	86.6	86.6	48.0	48.0	48.0	Lw	pMain_Comp2		0.0	0.0	0.0			15				0.0		(none)			
Wayside Compressor 1	~	OPT1mit_Way_comp1	86.6	86.6	86.6	48.0	48.0	48.0	Lw	pWay_comp1		0.0	0.0	0.0			15				0.0		(none)			
Main Shop bay door wash 1	~	OPT1unmit_Main_wash1	97.6	97.6	97.6	59.1	59.1	59.1	Lw	pMain_Bdoor_wash1		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door wash 2	~	OPT1unmit_Main_wash2	97.6	97.6	97.6	59.1	59.1	59.1	Lw	pMain_Bdoor_wash2		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door wash 1	~	OPT1mit_Main_wash1	94.6	94.6	94.6	56.1	56.1	56.1	Lw	pMain_Bdoor_wash1		0.0	0.0	0.0			3	60.00	60.00	0.00	0.0		(none)			
Main Shop bay door wash 2	~	OPT1mit_Main_wash2	94.6	94.6	94.6	56.1	56.1	56.1	Lw	pMain_Bdoor_wash2		0.0	0.0	0.0			3	60.00	60.00	0.00	0.0		(none)			
Main Shop bay door Wheel truing 1	~	OPT1unmit_Main_Bdoor_w1	119.7	119.7	119.7	81.1	81.1	81.1	Lw	pMain_Bdoor_Wheel1		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door Wheel truing 2	~	OPT1unmit_Main_Bdoor_w2	119.7	119.7	119.7	81.1	81.1	81.1	Lw	pMain_Bdoor_Wheel2		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door under car clean 1	~	OPT1unmit_Main_clean1	97.6	97.6	97.6	59.1	59.1	59.1	Lw	pMain_Bdoor_clean1		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door under car clean 2	~	OPT1unmit_Main_clean2	97.6	97.6	97.6	59.1	59.1	59.1	Lw	pMain_Bdoor_clean2		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door under car clean 1	~	OPT1mit_Main_clean1	94.6	94.6	94.6	56.1	56.1	56.1	Lw	pMain_Bdoor_clean1		0.0	0.0	0.0			3	60.00	60.00	0.00	0.0		(none)			
Main Shop bay door under car clean 2	~	OPT1mit_Main_clean2	94.6	94.6	94.6	56.1	56.1	56.1	Lw	pMain_Bdoor_clean2		0.0	0.0	0.0			3	60.00	60.00	0.00	0.0		(none)			
Main Shop bay door bodyshop 1	~	OPT1unmit_Main_body1	106.1	106.1	106.1	67.6	67.6	67.6	Lw	pMain_Bdoor_body1		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door bodyshop 2 - paint	~	OPT1unmit_Main_body2	86.9	86.9	86.9	48.3	48.3	48.3	Lw	pMain_Bdoor_body2		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door bodyshop 1	~	OPT1mit_Main_body1	103.1	103.1	103.1	64.6	64.6	64.6	Lw	pMain_Bdoor_body1		0.0	0.0	0.0			3	60.00	60.00	0.00	0.0		(none)			
Main Shop bay door bodyshop 2 - paint	~	OPT1mit_Main_body2	86.9	86.9	86.9	48.3	48.3	48.3	Lw	pMain_Bdoor_body2		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)			
Main Shop bay door bodyshop 1	~	OPT1unmit_Main_body1	106.1	106.1	106.1	67.6	67.6	67.6	Lw	pMain_Bdoor_body1		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door bodyshop 2 - paint	~	OPT1unmit_Main_body2	86.9	86.9	86.9	48.3	48.3	48.3	Lw	pMain_Bdoor_body2		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door bodyshop 1	~	OPT1mit_Main_body1	103.1	103.1	103.1	64.6	64.6	64.6	Lw	pMain_Bdoor_body1		0.0	0.0	0.0			3	60.00	60.00	0.00	0.0		(none)			
Main Shop bay door bodyshop 2 - paint	~	OPT1mit_Main_body2	86.9	86.9	86.9	48.3	48.3	48.3	Lw	pMain_Bdoor_body2		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)			
Main Shop bay door inspection 1	~	OPT1unmit_Main_insp1	106.1	106.1	106.1	67.6	67.6	67.6	Lw	pMain_Bdoor_inspec1		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door inspection 2	~	OPT1unmit_Main_insp2	95.6	95.6	95.6	57.0	57.0	57.0	Lw	pMain_Bdoor_inspec2		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door inspection 1	~	OPT1mit_Main_insp1	103.1	103.1	103.1	64.6	64.6	64.6	Lw	pMain_Bdoor_inspec1		0.0	0.0	0.0			3	60.00	60.00	0.00	0.0		(none)			
Main Shop bay door inspection 2	~	OPT1mit_Main_insp2	95.6	95.6	95.6	57.0	57.0	57.0	Lw	pMain_Bdoor_inspec2		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)			
Main Shop bay door maintenance and repair 1	~	OPT1unmit_Main_maint1	106.1	106.1	106.1	67.6	67.6	67.6	Lw	pMain_Bdoor_Maint1		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door maintenance and repair 2	~	OPT1unmit_Main_maint2	95.6	95.6	95.6	57.0	57.0	57.0	Lw	pMain_Bdoor_Maint2		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door maintenance and repair 3	~	OPT1unmit_Main_maint3	106.1	106.1	106.1	67.6	67.6	67.6	Lw	pMain_Bdoor_Maint3		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door maintenance and repair 4	~	OPT1unmit_Main_maint4	95.6	95.6	95.6	57.0	57.0	57.0	Lw	pMain_Bdoor_Maint4		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door maintenance and repair 1	~	OPT1mit_Main_maint1	103.1	103.1	103.1	64.6	64.6	64.6	Lw	pMain_Bdoor_Maint1		0.0	0.0	0.0			3	60.00	60.00	0.00	0.0		(none)			
Main Shop bay door maintenance and repair 2	~	OPT1mit_Main_maint2	95.6	95.6	95.6	57.0	57.0	57.0	Lw	pMain_Bdoor_Maint2		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)			
Main Shop bay door maintenance and repair 3	~	OPT1mit_Main_maint3	103.1	103.1	103.1	64.6	64.6	64.6	Lw	pMain_Bdoor_Maint3		0.0	0.0	0.0			3	60.00	60.00	0.00	0.0		(none)			
Main Shop bay door maintenance and repair 4	~	OPT1mit_Main_maint4	95.6	95.6	95.6	57.0	57.0	57.0	Lw	pMain_Bdoor_Maint4		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)			
Wayside Bay door1	~	OPT1_Way_Bdoor_1	106.1	106.1	106.1	67.6	67.6	67.6	Lw	pWay_Bdoor1		0.0	0.0	0.0							0.0		(none)			
Wayside Bay door2	~	OPT1_Way_Bdoor_2	95.6	95.6	95.6	57.0	57.0	57.0	Lw	pWay_Bdoor2		0.0	0.0	0.0							0.0		(none)			
Wayside Bay door3	~	OPT1_Way_Bdoor_3	86.9	86.9	86.9	48.3	48.3	48.3	Lw	pWay_Bdoor3		0.0	0.0	0.0							0.0		(none)			
Wayside Bay door4	~	OPT1_Way_Bdoor_4	86.9	86.9	86.9	48.3	48.3	48.3	Lw	pWay_Bdoor4		0.0	0.0	0.0							0.0		(none)			
Wayside Bay door5	~	OPT1_Way_Bdoor_5	86.9	86.9	86.9	48.3	48.3	48.3	Lw	pWay_Bdoor5		0.0	0.0	0.0							0.0		(none)			
Main Shop Heating Ventilation 1	~	OPT2_Main_HV1	87.3	87.3	87.3	48.8	48.8	48.8	Lw	pMain_HV1		0.0	0.0	0.0							0.0		(none)			
Main Shop Heating Ventilation 2	~	OPT2_Main_HV2	87.3	87.3	87.3	48.8	48.8	48.8	Lw	pMain_HV2		0.0	0.0	0.0							0.0		(none)			
Main Shop Heating Ventilation 3	~	OPT2_Main_HV3	87.3	87.3	87.3	48.8	48.8	48.8	Lw	pMain_HV3		0.0	0.0	0.0							0.0		(none)			
Main Shop Heating Ventilation 4	~	OPT2_Main_HV4	88.4	88.4	88.4	49.8	49.8	49.8	Lw	pMain_HV4		0.0	0.0	0.0							0.0		(none)			
Main Shop Heating Ventilation 5	~	OPT2_Main_HV5	91.4	91.4	91.4	52.9	52.9	52.9	Lw	pMain_HV5		0.0	0.0	0.0							0.0		(none)			

Finch MSF - Reference Design Mitigated

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night
Main Shop Heating Ventilation 6	~	OPT2_Main_HV6	91.1	91.1	91.1	52.5	52.5	52.5	Lw	pMain_HV6		0.0	0.0	0.0							0.0		(none)			
Main Shop Heating Ventilation 7	~	OPT2_Main_HV7	91.1	91.1	91.1	52.5	52.5	52.5	Lw	pMain_HV7		0.0	0.0	0.0							0.0		(none)			
Main Shop Makeup air 1	~	OPT2_Main_MAU1	88.4	88.4	88.4	49.8	49.8	49.8	Lw	pMain_MAU1		0.0	0.0	0.0							0.0		(none)			
Main Shop Makeup air 2	~	OPT2_Main_MAU2	83.4	83.4	83.4	44.9	44.9	44.9	Lw	pMain_MAU2		0.0	0.0	0.0							0.0		(none)			
Main Shop Makeup air 3	~	OPT2_Main_MAU3	85.7	85.7	85.7	47.2	47.2	47.2	Lw	pMain_MAU3		0.0	0.0	0.0							0.0		(none)			
Operations Company Air Conditioning 1	~	OPT2unmit_OpsCo_AC1	107.0	107.0	107.0	68.4	68.4	68.4	Lw	pOpsCo_AC1		0.0	0.0	0.0							0.0		(none)			
Operations Company Air Conditioning 2	~	OPT2unmit_OpsCo_AC2	107.0	107.0	107.0	68.4	68.4	68.4	Lw	pOpsCo_AC2		0.0	0.0	0.0							0.0		(none)			
Operations Company Air Conditioning 1	~	OPT2mit_OpsCo_AC1	92.0	92.0	92.0	53.4	53.4	53.4	Lw	pOpsCo_AC1		0.0	0.0	0.0			15				0.0		(none)			
Operations Company Air Conditioning 2	~	OPT2mit_OpsCo_AC2	92.0	92.0	92.0	53.4	53.4	53.4	Lw	pOpsCo_AC2		0.0	0.0	0.0			15				0.0		(none)			
Main Shop Air conditioning 1	~	OPT2_Main_AC1	91.6	91.6	91.6	53.1	53.1	53.1	Lw	pMain_AC1		0.0	0.0	0.0							0.0		(none)			
Main Shop Air conditioning 2	~	OPT2_Main_AC2	85.8	85.8	85.8	47.3	47.3	47.3	Lw	pMain_AC2		0.0	0.0	0.0							0.0		(none)			
Main Shop Air conditioning 3	~	OPT2_Main_AC3	85.8	85.8	85.8	47.3	47.3	47.3	Lw	pMain_AC3		0.0	0.0	0.0							0.0		(none)			
Main Shop Air conditioning 4	~	OPT2_Main_AC4	86.2	86.2	86.2	47.6	47.6	47.6	Lw	pMain_AC4		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 1	~	OPT2_Main_EF01	70.4	70.4	70.4	31.8	31.8	31.8	Lw	pMain_EF1		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 2	~	OPT2_Main_EF02	67.1	67.1	67.1	28.5	28.5	28.5	Lw	pMain_EF2		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 3	~	OPT2_Main_EF03	66.1	66.1	66.1	27.6	27.6	27.6	Lw	pMain_EF3		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 4	~	OPT2_Main_EF04	59.6	59.6	59.6	21.0	21.0	21.0	Lw	pMain_EF4		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 5	~	OPT2_Main_EF05	59.6	59.6	59.6	21.0	21.0	21.0	Lw	pMain_EF5		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 6	~	OPT2_Main_EF06	59.6	59.6	59.6	21.0	21.0	21.0	Lw	pMain_EF6		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 7	~	OPT2_Main_EF07	75.2	75.2	75.2	36.6	36.6	36.6	Lw	pMain_EF7		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 8	~	OPT2_Main_EF08	71.5	71.5	71.5	33.0	33.0	33.0	Lw	pMain_EF8		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 9	~	OPT2_Main_EF09	59.6	59.6	59.6	21.0	21.0	21.0	Lw	pMain_EF9		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 10	~	OPT2_Main_EF10	59.6	59.6	59.6	21.0	21.0	21.0	Lw	pMain_EF10		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 11	~	OPT2_Main_EF11	59.6	59.6	59.6	21.0	21.0	21.0	Lw	pMain_EF11		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 12	~	OPT2_Main_EF12	59.6	59.6	59.6	21.0	21.0	21.0	Lw	pMain_EF12		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 13	~	OPT2_Main_EF13	81.4	81.4	81.4	42.8	42.8	42.8	Lw	pMain_EF13		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 14	~	OPT2_Main_EF14	76.4	76.4	76.4	37.9	37.9	37.9	Lw	pMain_EF14		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 15	~	OPT2_Main_EF15	81.3	81.3	81.3	42.7	42.7	42.7	Lw	pMain_EF15		0.0	0.0	0.0							0.0		(none)			
Wayside Air Conditioning 1	~	OPT2_Way_AC1	91.6	91.6	91.6	53.1	53.1	53.1	Lw	pWay_AC1		0.0	0.0	0.0							0.0		(none)			
Wayside Air Conditioning 2	~	OPT2_Way_AC2	83.1	83.1	83.1	44.5	44.5	44.5	Lw	pWay_AC2		0.0	0.0	0.0							0.0		(none)			
Wayside Heating Ventilation 1	~	OPT2_Way_HV1	91.4	91.4	91.4	52.9	52.9	52.9	Lw	pWay_HV1		0.0	0.0	0.0							0.0		(none)			
Wayside Heating Ventilation 2	~	OPT2_Way_HV2	82.9	82.9	82.9	44.3	44.3	44.3	Lw	pWay_HV2		0.0	0.0	0.0							0.0		(none)			
Main Shop Paint Booth 1	~	OPT2_Main_PB1	90.0	90.0	90.0	51.4	51.4	51.4	Lw	pMain_PB1		0.0	0.0	0.0							0.0		(none)			
Main Shop Compressor 1	~	OPT2unmit_Main_Comp1	101.6	101.6	101.6	63.0	63.0	63.0	Lw	pMain_comp1		0.0	0.0	0.0							0.0		(none)			
Main Shop Compressor 2	~	OPT2unmit_Main_Comp2	101.6	101.6	101.6	63.0	63.0	63.0	Lw	pMain_Comp2		0.0	0.0	0.0							0.0		(none)			
Wayside Compressor 1	~	OPT2unmit_Way_comp1	101.6	101.6	101.6	63.0	63.0	63.0	Lw	pWay_comp1		0.0	0.0	0.0							0.0		(none)			
Main Shop Compressor 1	~	OPT2mit_Main_Comp1	91.6	91.6	91.6	53.0	53.0	53.0	Lw	pMain_comp1		0.0	0.0	0.0			10				0.0		(none)			
Main Shop Compressor 2	~	OPT2mit_Main_Comp2	91.6	91.6	91.6	53.0	53.0	53.0	Lw	pMain_Comp2		0.0	0.0	0.0			10				0.0		(none)			
Wayside Compressor 1	~	OPT2mit_Way_comp1	91.6	91.6	91.6	53.0	53.0	53.0	Lw	pWay_comp1		0.0	0.0	0.0			10				0.0		(none)			
Main Shop bay door wash 1	~	OPT2unmit_Main_wash1	97.6	97.6	97.6	59.1	59.1	59.1	Lw	pMain_Bdoor_wash1		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door wash 2	~	OPT2unmit_Main_wash2	97.6	97.6	97.6	59.1	59.1	59.1	Lw	pMain_Bdoor_wash2		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door wash 1	~	OPT2mit_Main_wash1	97.6	97.6	97.6	59.1	59.1	59.1	Lw	pMain_Bdoor_wash1		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)			
Main Shop bay door wash 2	~	OPT2mit_Main_wash2	97.6	97.6	97.6	59.1	59.1	59.1	Lw	pMain_Bdoor_wash2		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)			
Main Shop bay door Wheel truing 1	~	OPT2unmit_Main_wheel1	119.7	119.7	119.7	81.1	81.1	81.1	Lw	pMain_Bdoor_Wheel1		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door Wheel truing 2	~	OPT2unmit_Main_wheel2	119.7	119.7	119.7	81.1	81.1	81.1	Lw	pMain_Bdoor_Wheel2		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door under car clean 1	~	OPT2unmit_Main_clean1	97.6	97.6	97.6	59.1	59.1	59.1	Lw	pMain_Bdoor_clean1		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)			
Main Shop bay door under car clean 2	~	OPT2unmit_Main_clean2	97.6	97.6	97.6	59.1	59.1	59.1	Lw	pMain_Bdoor_clean2		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door under car clean 1	~	OPT2mit_Main_clean1	97.6	97.6	97.6	59.1	59.1	59.1	Lw	pMain_Bdoor_clean1		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)			
Main Shop bay door under car clean 2	~	OPT2mit_Main_clean2	97.6	97.6	97.6	59.1	59.1	59.1	Lw	pMain_Bdoor_clean2		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)			
Main Shop bay door bodyshop 1	~	OPT2unmit_Main_body1	106.1	106.1	106.1	67.6	67.6	67.6	Lw	pMain_Bdoor_body1		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door bodyshop 2 - paint	~	OPT2unmit_Main_body2	86.9	86.9	86.9	48.3	48.3	48.3	Lw	pMain_Bdoor_body2		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door bodyshop 1	~	OPT2mit_Main_body1	106.1	106.1	106.1	67.6	67.6	67.6	Lw	pMain_Bdoor_body1		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)			
Main Shop bay door bodyshop 2 - paint	~	OPT2mit_Main_body2	86.9	86.9	86.9	48.3	48.3	48.3	Lw	pMain_Bdoor_body2		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)			
Main Shop bay door inspection 1	~	OPT2unmit_Main_insp1	106.1	106.1	106.1	67.6	67.6	67.6	Lw	pMain_Bdoor_inspec1		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door inspection 2	~	OPT2unmit_Main_insp2	95.6	95.6	95.6	57.0	57.0	57.0	Lw	pMain_Bdoor_inspec2		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door inspection 1	~	OPT2mit_Main_insp1	106.1	106.1	106.1	67.6	67.6	67.6	Lw	pMain_Bdoor_inspec1		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)			
Main Shop bay door inspection 2	~	OPT2mit_Main_insp2	95.6	95.6	95.6	57.0	57.0	57.0	Lw	pMain_Bdoor_inspec2		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)			
Main Shop bay door maintenance and repair 1	~	OPT2unmit_Main_maint1	106.1	106.1	106.1	67.6	67.6	67.6	Lw	pMain_Bdoor_Maint1		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door maintenance and repair 2	~	OPT2unmit_Main_maint2	95.6	95.6	95.6	57.0	57.0	57.0	Lw	pMain_Bdoor_Maint2		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door maintenance and repair 3	~	OPT2unmit_Main_maint3	106.1	106.1	106.1	67.6	67.6	67.6	Lw	pMain_Bdoor_Maint3		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door maintenance and repair 4	~	OPT2unmit_Main_maint4	95.6	95.6	95.6	57.0	57.0	57.0	Lw	pMain_Bdoor_Maint4		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door maintenance and repair 1	~	OPT2mit_Main_maint1	106.1	106.1	106.1	67.6	67.6	67.6	Lw	pMain_Bdoor_Maint1		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)			
Main Shop bay door maintenance and repair 2	~	OPT2mit_Main_maint2	95.6	95.6	95.6	57.0	57.0	57.0	Lw	pMain_Bdoor_Maint2		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)			
Main Shop bay door maintenance and repair 3	~	OPT2mit_Main_maint3	106.1	106.1	106.1	67.6	67.6	67.6	Lw	pMain_Bdoor_Maint3		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)			
Main Shop bay door maintenance and repair 4	~	OPT2mit_Main_maint4	95.6	95.6	95.6	57.0	57.0	57.0	Lw	pMain_Bdoor_Maint4		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)			
Wayside Bay door1	~	OPT2unmit_Way_Bdoor_1	106.1	106.1	106.1	67.6	67.6	67.6	Lw	pWay_Bdoor1		0.0	0.0	0.0							0.0		(none)			
Wayside Bay door2	~	OPT2unmit_Way_Bdoor_2	95.6	95.6	95.6	57.0	57.0	57.0	Lw	pWay_Bdoor2		0.0	0.0	0.0							0.0		(none)			
Wayside Bay door3	~	OPT2unmit_Way_Bdoor_3	86.9	86.9	86.9	48.3	48.3	48.3	Lw	pWay_Bdoor3		0.0	0.0	0.0							0.0		(none)			
Wayside Bay door4	~	OPT2unmit_Way_Bdoor_4	86.9	86.9	86.9	48.3	48.3	48.3	Lw	pWay_Bdoor4		0.0	0.0	0.0							0.0		(none)			
Wayside Bay door5	~	OPT2unmit_Way_Bdoor_5	86.9	86.9	86.9	48.3	48.3	48.3	Lw	pWay_Bdoor5		0.0	0.0	0.0							0.0		(none)			
Wayside Bay door1	~	OPT2mit_Way_Bdoor_1	106.1	106.1	106.1	67.6	67.6	67.6	Lw	pWay_Bdoor1		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)			

Finch MSF - Reference Design Mitigated

Name	M.	ID	Result. PWL			Result. PWL''				Lw / Li		Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night
Wayside Bay door2	~	OPT2mit_Way_Bdoor_2	95.6	95.6	95.6	57.0	57.0	57.0	Lw	pWay_Bdoor2		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)			
Wayside Bay door3	~	OPT2mit_Way_Bdoor_3	86.9	86.9	86.9	48.3	48.3	48.3	Lw	pWay_Bdoor3		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)			
Wayside Bay door4	~	OPT2mit_Way_Bdoor_4	86.9	86.9	86.9	48.3	48.3	48.3	Lw	pWay_Bdoor4		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)			
Wayside Bay door5	~	OPT2mit_Way_Bdoor_5	86.9	86.9	86.9	48.3	48.3	48.3	Lw	pWay_Bdoor5		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)			
Main Shop Heating Ventilation 1	~	OPT3_Main_HV1	87.3	87.3	87.3	48.8	48.8	48.8	Lw	pMain_HV1		0.0	0.0	0.0							0.0		(none)			
Main Shop Heating Ventilation 2	~	OPT3_Main_HV2	87.3	87.3	87.3	48.8	48.8	48.8	Lw	pMain_HV2		0.0	0.0	0.0							0.0		(none)			
Main Shop Heating Ventilation 3	~	OPT3_Main_HV3	87.3	87.3	87.3	48.8	48.8	48.8	Lw	pMain_HV3		0.0	0.0	0.0							0.0		(none)			
Main Shop Heating Ventilation 4	~	OPT3_Main_HV4	88.4	88.4	88.4	49.8	49.8	49.8	Lw	pMain_HV4		0.0	0.0	0.0							0.0		(none)			
Main Shop Heating Ventilation 5	~	OPT3_Main_HV5	91.4	91.4	91.4	52.9	52.9	52.9	Lw	pMain_HV5		0.0	0.0	0.0							0.0		(none)			
Main Shop Heating Ventilation 6	~	OPT3_Main_HV6	91.1	91.1	91.1	52.5	52.5	52.5	Lw	pMain_HV6		0.0	0.0	0.0							0.0		(none)			
Main Shop Heating Ventilation 7	~	OPT3_Main_HV7	91.1	91.1	91.1	52.5	52.5	52.5	Lw	pMain_HV7		0.0	0.0	0.0							0.0		(none)			
Main Shop Makeup air 1	~	OPT3_Main_MAU1	88.4	88.4	88.4	49.8	49.8	49.8	Lw	pMain_MAU1		0.0	0.0	0.0							0.0		(none)			
Main Shop Makeup air 2	~	OPT3_Main_MAU2	83.4	83.4	83.4	44.9	44.9	44.9	Lw	pMain_MAU2		0.0	0.0	0.0							0.0		(none)			
Main Shop Makeup air 3	~	OPT3_Main_MAU3	85.7	85.7	85.7	47.2	47.2	47.2	Lw	pMain_MAU3		0.0	0.0	0.0							0.0		(none)			
Operations Company Air Conditioning 1	~	OPT3unmit_OpsCo_AC1	107.0	107.0	107.0	68.4	68.4	68.4	Lw	pOpsCo_AC1		0.0	0.0	0.0							0.0		(none)			
Operations Company Air Conditioning 2	~	OPT3unmit_OpsCo_AC2	107.0	107.0	107.0	68.4	68.4	68.4	Lw	pOpsCo_AC2		0.0	0.0	0.0							0.0		(none)			
Operations Company Air Conditioning 1	~	OPT3mit_OpsCo_AC1	97.0	97.0	97.0	58.4	58.4	58.4	Lw	pOpsCo_AC1		0.0	0.0	0.0			10				0.0		(none)			
Operations Company Air Conditioning 2	~	OPT3mit_OpsCo_AC2	97.0	97.0	97.0	58.4	58.4	58.4	Lw	pOpsCo_AC2		0.0	0.0	0.0			10				0.0		(none)			
Main Shop Air conditioning 1	~	OPT3_Main_AC1	91.6	91.6	91.6	53.1	53.1	53.1	Lw	pMain_AC1		0.0	0.0	0.0							0.0		(none)			
Main Shop Air conditioning 2	~	OPT3_Main_AC2	85.8	85.8	85.8	47.3	47.3	47.3	Lw	pMain_AC2		0.0	0.0	0.0							0.0		(none)			
Main Shop Air conditioning 3	~	OPT3_Main_AC3	85.8	85.8	85.8	47.3	47.3	47.3	Lw	pMain_AC3		0.0	0.0	0.0							0.0		(none)			
Main Shop Air conditioning 4	~	OPT3_Main_AC4	86.2	86.2	86.2	47.6	47.6	47.6	Lw	pMain_AC4		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 1	~	OPT3_Main_EF01	70.4	70.4	70.4	31.8	31.8	31.8	Lw	pMain_EF1		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 2	~	OPT3_Main_EF02	67.1	67.1	67.1	28.5	28.5	28.5	Lw	pMain_EF2		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 3	~	OPT3_Main_EF03	66.1	66.1	66.1	27.6	27.6	27.6	Lw	pMain_EF3		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 4	~	OPT3_Main_EF04	59.6	59.6	59.6	21.0	21.0	21.0	Lw	pMain_EF4		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 5	~	OPT3_Main_EF05	59.6	59.6	59.6	21.0	21.0	21.0	Lw	pMain_EF5		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 6	~	OPT3_Main_EF06	59.6	59.6	59.6	21.0	21.0	21.0	Lw	pMain_EF6		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 7	~	OPT3_Main_EF07	75.2	75.2	75.2	36.6	36.6	36.6	Lw	pMain_EF7		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 8	~	OPT3_Main_EF08	71.5	71.5	71.5	33.0	33.0	33.0	Lw	pMain_EF8		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 9	~	OPT3_Main_EF09	59.6	59.6	59.6	21.0	21.0	21.0	Lw	pMain_EF9		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 10	~	OPT3_Main_EF10	59.6	59.6	59.6	21.0	21.0	21.0	Lw	pMain_EF10		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 11	~	OPT3_Main_EF11	59.6	59.6	59.6	21.0	21.0	21.0	Lw	pMain_EF11		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 12	~	OPT3_Main_EF12	59.6	59.6	59.6	21.0	21.0	21.0	Lw	pMain_EF12		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 13	~	OPT3_Main_EF13	81.4	81.4	81.4	42.8	42.8	42.8	Lw	pMain_EF13		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 14	~	OPT3_Main_EF14	76.4	76.4	76.4	37.9	37.9	37.9	Lw	pMain_EF14		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 15	~	OPT3_Main_EF15	81.3	81.3	81.3	42.7	42.7	42.7	Lw	pMain_EF15		0.0	0.0	0.0							0.0		(none)			
Wayside Air Conditioning 1	~	OPT3_Way_AC1	91.6	91.6	91.6	53.1	53.1	53.1	Lw	pWay_AC1		0.0	0.0	0.0							0.0		(none)			
Wayside Air Conditioning 2	~	OPT3_Way_AC2	83.1	83.1	83.1	44.5	44.5	44.5	Lw	pWay_AC2		0.0	0.0	0.0							0.0		(none)			
Wayside Heating Ventilation 1	~	OPT3_Way_HV1	91.4	91.4	91.4	52.9	52.9	52.9	Lw	pWay_HV1		0.0	0.0	0.0							0.0		(none)			
Wayside Heating Ventilation 2	~	OPT3_Way_HV2	82.9	82.9	82.9	44.3	44.3	44.3	Lw	pWay_HV2		0.0	0.0	0.0							0.0		(none)			
Main Shop Paint Booth 1	~	OPT3_Main_PB1	90.0	90.0	90.0	51.4	51.4	51.4	Lw	pMain_PB1		0.0	0.0	0.0							0.0		(none)			
Main Shop Compressor 1	~	OPT3unmit_Main_Comp1	101.6	101.6	101.6	63.0	63.0	63.0	Lw	pMain_comp1		0.0	0.0	0.0							0.0		(none)			
Main Shop Compressor 2	~	OPT3unmit_Main_Comp2	101.6	101.6	101.6	63.0	63.0	63.0	Lw	pMain_Comp2		0.0	0.0	0.0							0.0		(none)			
Wayside Compressor 1	~	OPT3unmit_Way_comp1	101.6	101.6	101.6	63.0	63.0	63.0	Lw	pWay_comp1		0.0	0.0	0.0							0.0		(none)			
Main Shop Compressor 1	~	OPT3mit_Main_Comp1	96.6	96.6	96.6	58.0	58.0	58.0	Lw	pMain_comp1		0.0	0.0	0.0			5				0.0		(none)			
Main Shop Compressor 2	~	OPT3mit_Main_Comp2	96.6	96.6	96.6	58.0	58.0	58.0	Lw	pMain_Comp2		0.0	0.0	0.0			5				0.0		(none)			
Wayside Compressor 1	~	OPT3mit_Way_comp1	96.6	96.6	96.6	58.0	58.0	58.0	Lw	pWay_comp1		0.0	0.0	0.0			5				0.0		(none)			
Main Shop bay door wash 1	~	OPT3unmit_Main_wash1	97.6	97.6	97.6	59.1	59.1	59.1	Lw	pMain_Bdoor_wash1		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door wash 2	~	OPT3unmit_Main_wash2	97.6	97.6	97.6	59.1	59.1	59.1	Lw	pMain_Bdoor_wash2		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door wash 1	~	OPT3mit_Main_wash1	91.6	91.6	91.6	53.1	53.1	53.1	Lw	pMain_Bdoor_wash1		0.0	0.0	0.0			6	60.00	60.00	0.00	0.0		(none)			
Main Shop bay door wash 2	~	OPT3mit_Main_wash2	91.6	91.6	91.6	53.1	53.1	53.1	Lw	pMain_Bdoor_wash2		0.0	0.0	0.0			6	60.00	60.00	0.00	0.0		(none)			
Main Shop bay door Wheel truing 1	~	OPT3unmit_Main_wheel1	119.7	119.7	119.7	81.1	81.1	81.1	Lw	pMain_Bdoor_Wheel1		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door Wheel truing 2	~	OPT3unmit_Main_wheel2	119.7	119.7	119.7	81.1	81.1	81.1	Lw	pMain_Bdoor_Wheel2		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door under car clean 1	~	OPT3unmit_Main_clean1	97.6	97.6	97.6	59.1	59.1	59.1	Lw	pMain_Bdoor_clean1		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door under car clean 2	~	OPT3unmit_Main_clean2	97.6	97.6	97.6	59.1	59.1	59.1	Lw	pMain_Bdoor_clean2		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door under car clean 1	~	OPT3mit_Main_clean1	91.6	91.6	91.6	53.1	53.1	53.1	Lw	pMain_Bdoor_clean1		0.0	0.0	0.0			6	60.00	60.00	0.00	0.0		(none)			
Main Shop bay door under car clean 2	~	OPT3mit_Main_clean2	91.6	91.6	91.6	53.1	53.1	53.1	Lw	pMain_Bdoor_clean2		0.0	0.0	0.0			6	60.00	60.00	0.00	0.0		(none)			
Main Shop bay door bodyshop 1	~	OPT3unmit_Main_body1	106.1	106.1	106.1	67.6	67.6	67.6	Lw	pMain_Bdoor_body1		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door bodyshop 2 - paint	~	OPT3unmit_Main_body2	86.9	86.9	86.9	48.3	48.3	48.3	Lw	pMain_Bdoor_body2		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door bodyshop 1	~	OPT3mit_Main_body1	100.1	100.1	100.1	61.6	61.6	61.6	Lw	pMain_Bdoor_body1		0.0	0.0	0.0			6	60.00	60.00	0.00	0.0		(none)			
Main Shop bay door bodyshop 2 - paint	~	OPT3mit_Main_body2	80.9	80.9	80.9	42.3	42.3	42.3	Lw	pMain_Bdoor_body2		0.0	0.0	0.0			6	60.00	60.00	0.00	0.0		(none)			
Main Shop bay door inspection 1	~	OPT3unmit_Main_insp1	106.1	106.1	106.1	67.6	67.6	67.6	Lw	pMain_Bdoor_inspec1		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door inspection 2	~	OPT3unmit_Main_insp2	95.6	95.6	95.6	57.0	57.0	57.0	Lw	pMain_Bdoor_inspec2		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door inspection 1	~	OPT3mit_Main_insp1	100.1	100.1	100.1	61.6	61.6	61.6	Lw	pMain_Bdoor_inspec1		0.0	0.0	0.0			6	60.00	60.00	0.00	0.0		(none)			
Main Shop bay door inspection 2	~	OPT3mit_Main_insp2	89.6	89.6	89.6	51.0	51.0	51.0	Lw	pMain_Bdoor_inspec2		0.0	0.0	0.0			6	60.00	60.00	0.00	0.0		(none)			
Main Shop bay door maintenance and repair 1	~	OPT3unmit_Main_maint1	106.1	106.1	106.1	67.6	67.6	67.6	Lw	pMain_Bdoor_Maint1		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door maintenance and repair 2	~	OPT3unmit_Main_maint2	95.6	95.6	95.6	57.0	57.0	57.0	Lw	pMain_Bdoor_Maint2		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door maintenance and repair 3	~	OPT3unmit_Main_maint3	106.1	106.1	106.1	67.6	67.6	67.6	Lw	pMain_Bdoor_Maint3		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door maintenance and repair 4	~	OPT3unmit_Main_maint4	95.6	95.6	95.6	57.0	57.0	57.0	Lw	pMain_Bdoor_Maint4		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door maintenance and repair 1	~	OPT3mit_Main_maint1	100.1	100.1	100.1	61.6	61.6	61.6	Lw	pMain_Bdoor_Maint1		0.0	0.0	0.0			6	60.00	60.00	0.00	0.0		(none)			

Finch MSF - Reference Design Mitigated

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night
Main Shop bay door maintenance and repair 2	~	OPT3mit_Main_maint2	89.6	89.6	89.6	51.0	51.0	51.0	Lw	pMain_Bdoor_Maint2		0.0	0.0	0.0			6	60.00	60.00	0.00	0.0		(none)			
Main Shop bay door maintenance and repair 3	~	OPT3mit_Main_maint3	100.1	100.1	100.1	61.6	61.6	61.6	Lw	pMain_Bdoor_Maint3		0.0	0.0	0.0			6	60.00	60.00	0.00	0.0		(none)			
Main Shop bay door maintenance and repair 4	~	OPT3mit_Main_maint4	89.6	89.6	89.6	51.0	51.0	51.0	Lw	pMain_Bdoor_Maint4		0.0	0.0	0.0			6	60.00	60.00	0.00	0.0		(none)			
Wayside Bay door1	~	OPT3unmit_Way_Bdoor_1	106.1	106.1	106.1	67.6	67.6	67.6	Lw	pWay_Bdoor1		0.0	0.0	0.0							0.0		(none)			
Wayside Bay door2	~	OPT3unmit_Way_Bdoor_2	95.6	95.6	95.6	57.0	57.0	57.0	Lw	pWay_Bdoor2		0.0	0.0	0.0							0.0		(none)			
Wayside Bay door3	~	OPT3unmit_Way_Bdoor_3	86.9	86.9	86.9	48.3	48.3	48.3	Lw	pWay_Bdoor3		0.0	0.0	0.0							0.0		(none)			
Wayside Bay door4	~	OPT3unmit_Way_Bdoor_4	86.9	86.9	86.9	48.3	48.3	48.3	Lw	pWay_Bdoor4		0.0	0.0	0.0							0.0		(none)			
Wayside Bay door5	~	OPT3unmit_Way_Bdoor_5	86.9	86.9	86.9	48.3	48.3	48.3	Lw	pWay_Bdoor5		0.0	0.0	0.0							0.0		(none)			
Wayside Bay door1	~	OPT3mit_Way_Bdoor_1	103.1	103.1	103.1	64.6	64.6	64.6	Lw	pWay_Bdoor1		0.0	0.0	0.0			3	60.00	60.00	0.00	0.0		(none)			
Wayside Bay door2	~	OPT3mit_Way_Bdoor_2	92.6	92.6	92.6	54.0	54.0	54.0	Lw	pWay_Bdoor2		0.0	0.0	0.0			3	60.00	60.00	0.00	0.0		(none)			
Wayside Bay door3	~	OPT3mit_Way_Bdoor_3	83.9	83.9	83.9	45.3	45.3	45.3	Lw	pWay_Bdoor3		0.0	0.0	0.0			3	60.00	60.00	0.00	0.0		(none)			
Wayside Bay door4	~	OPT3mit_Way_Bdoor_4	83.9	83.9	83.9	45.3	45.3	45.3	Lw	pWay_Bdoor4		0.0	0.0	0.0			3	60.00	60.00	0.00	0.0		(none)			
Wayside Bay door5	~	OPT3mit_Way_Bdoor_5	83.9	83.9	83.9	45.3	45.3	45.3	Lw	pWay_Bdoor5		0.0	0.0	0.0			3	60.00	60.00	0.00	0.0		(none)			
Main Shop Heating Ventilation 1	~	OPT4_Main_HV1	87.3	87.3	87.3	48.8	48.8	48.8	Lw	pMain_HV1		0.0	0.0	0.0							0.0		(none)			
Main Shop Heating Ventilation 2	~	OPT4_Main_HV2	87.3	87.3	87.3	48.8	48.8	48.8	Lw	pMain_HV2		0.0	0.0	0.0							0.0		(none)			
Main Shop Heating Ventilation 3	~	OPT4_Main_HV3	87.3	87.3	87.3	48.8	48.8	48.8	Lw	pMain_HV3		0.0	0.0	0.0							0.0		(none)			
Main Shop Heating Ventilation 4	~	OPT4_Main_HV4	88.4	88.4	88.4	49.8	49.8	49.8	Lw	pMain_HV4		0.0	0.0	0.0							0.0		(none)			
Main Shop Heating Ventilation 5	~	OPT4_Main_HV5	91.4	91.4	91.4	52.9	52.9	52.9	Lw	pMain_HV5		0.0	0.0	0.0							0.0		(none)			
Main Shop Heating Ventilation 6	~	OPT4_Main_HV6	91.1	91.1	91.1	52.5	52.5	52.5	Lw	pMain_HV6		0.0	0.0	0.0							0.0		(none)			
Main Shop Heating Ventilation 7	~	OPT4_Main_HV7	91.1	91.1	91.1	52.5	52.5	52.5	Lw	pMain_HV7		0.0	0.0	0.0							0.0		(none)			
Main Shop Makeup air 1	~	OPT4_Main_MAU1	88.4	88.4	88.4	49.8	49.8	49.8	Lw	pMain_MAU1		0.0	0.0	0.0							0.0		(none)			
Main Shop Makeup air 2	~	OPT4_Main_MAU2	83.4	83.4	83.4	44.9	44.9	44.9	Lw	pMain_MAU2		0.0	0.0	0.0							0.0		(none)			
Main Shop Makeup air 3	~	OPT4_Main_MAU3	85.7	85.7	85.7	47.2	47.2	47.2	Lw	pMain_MAU3		0.0	0.0	0.0							0.0		(none)			
Operations Company Air Conditioning 1	~	OPT4unmit_OpsCo_AC1	107.0	107.0	107.0	68.4	68.4	68.4	Lw	pOpsCo_AC1		0.0	0.0	0.0							0.0		(none)			
Operations Company Air Conditioning 2	~	OPT4unmit_OpsCo_AC2	107.0	107.0	107.0	68.4	68.4	68.4	Lw	pOpsCo_AC2		0.0	0.0	0.0							0.0		(none)			
Operations Company Air Conditioning 1	~	OPT4mit_OpsCo_AC1	87.0	87.0	87.0	48.4	48.4	48.4	Lw	pOpsCo_AC1		0.0	0.0	0.0			20				0.0		(none)			
Operations Company Air Conditioning 2	~	OPT4mit_OpsCo_AC2	87.0	87.0	87.0	48.4	48.4	48.4	Lw	pOpsCo_AC2		0.0	0.0	0.0			20				0.0		(none)			
Main Shop Air conditioning 1	~	OPT4_Main_AC1	91.6	91.6	91.6	53.1	53.1	53.1	Lw	pMain_AC1		0.0	0.0	0.0							0.0		(none)			
Main Shop Air conditioning 2	~	OPT4_Main_AC2	85.8	85.8	85.8	47.3	47.3	47.3	Lw	pMain_AC2		0.0	0.0	0.0							0.0		(none)			
Main Shop Air conditioning 3	~	OPT4_Main_AC3	85.8	85.8	85.8	47.3	47.3	47.3	Lw	pMain_AC3		0.0	0.0	0.0							0.0		(none)			
Main Shop Air conditioning 4	~	OPT4_Main_AC4	86.2	86.2	86.2	47.6	47.6	47.6	Lw	pMain_AC4		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 1	~	OPT4_Main_EF01	70.4	70.4	70.4	31.8	31.8	31.8	Lw	pMain_EF1		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 2	~	OPT4_Main_EF02	67.1	67.1	67.1	28.5	28.5	28.5	Lw	pMain_EF2		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 3	~	OPT4_Main_EF03	66.1	66.1	66.1	27.6	27.6	27.6	Lw	pMain_EF3		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 4	~	OPT4_Main_EF04	59.6	59.6	59.6	21.0	21.0	21.0	Lw	pMain_EF4		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 5	~	OPT4_Main_EF05	59.6	59.6	59.6	21.0	21.0	21.0	Lw	pMain_EF5		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 6	~	OPT4_Main_EF06	59.6	59.6	59.6	21.0	21.0	21.0	Lw	pMain_EF6		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 7	~	OPT4_Main_EF07	75.2	75.2	75.2	36.6	36.6	36.6	Lw	pMain_EF7		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 8	~	OPT4_Main_EF08	71.5	71.5	71.5	33.0	33.0	33.0	Lw	pMain_EF8		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 9	~	OPT4_Main_EF09	59.6	59.6	59.6	21.0	21.0	21.0	Lw	pMain_EF9		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 10	~	OPT4_Main_EF10	59.6	59.6	59.6	21.0	21.0	21.0	Lw	pMain_EF10		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 11	~	OPT4_Main_EF11	59.6	59.6	59.6	21.0	21.0	21.0	Lw	pMain_EF11		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 12	~	OPT4_Main_EF12	59.6	59.6	59.6	21.0	21.0	21.0	Lw	pMain_EF12		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 13	~	OPT4_Main_EF13	81.4	81.4	81.4	42.8	42.8	42.8	Lw	pMain_EF13		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 14	~	OPT4_Main_EF14	76.4	76.4	76.4	37.9	37.9	37.9	Lw	pMain_EF14		0.0	0.0	0.0							0.0		(none)			
Main Shop Exhaust Fan 15	~	OPT4_Main_EF15	81.3	81.3	81.3	42.7	42.7	42.7	Lw	pMain_EF15		0.0	0.0	0.0							0.0		(none)			
Wayside Air Conditioning 1	~	OPT4_Way_AC1	91.6	91.6	91.6	53.1	53.1	53.1	Lw	pWay_AC1		0.0	0.0	0.0							0.0		(none)			
Wayside Air Conditioning 2	~	OPT4_Way_AC2	83.1	83.1	83.1	44.5	44.5	44.5	Lw	pWay_AC2		0.0	0.0	0.0							0.0		(none)			
Wayside Heating Ventilation 1	~	OPT4_Way_HV1	91.4	91.4	91.4	52.9	52.9	52.9	Lw	pWay_HV1		0.0	0.0	0.0							0.0		(none)			
Wayside Heating Ventilation 2	~	OPT4_Way_HV2	82.9	82.9	82.9	44.3	44.3	44.3	Lw	pWay_HV2		0.0	0.0	0.0							0.0		(none)			
Main Shop Paint Booth 1	~	OPT4_Main_PB1	90.0	90.0	90.0	51.4	51.4	51.4	Lw	pMain_PB1		0.0	0.0	0.0							0.0		(none)			
Main Shop Compressor 1	~	OPT4unmit_Main_Comp1	101.6	101.6	101.6	63.0	63.0	63.0	Lw	pMain_comp1		0.0	0.0	0.0							0.0		(none)			
Main Shop Compressor 2	~	OPT4unmit_Main_Comp2	101.6	101.6	101.6	63.0	63.0	63.0	Lw	pMain_Comp2		0.0	0.0	0.0							0.0		(none)			
Wayside Compressor 1	~	OPT4unmit_Way_comp1	101.6	101.6	101.6	63.0	63.0	63.0	Lw	pWay_comp1		0.0	0.0	0.0							0.0		(none)			
Main Shop Compressor 1	~	OPT4mit_Main_Comp1	81.6	81.6	81.6	43.0	43.0	43.0	Lw	pMain_comp1		0.0	0.0	0.0			20				0.0		(none)			
Main Shop Compressor 2	~	OPT4mit_Main_Comp2	81.6	81.6	81.6	43.0	43.0	43.0	Lw	pMain_Comp2		0.0	0.0	0.0			20				0.0		(none)			
Wayside Compressor 1	~	OPT4mit_Way_comp1	81.6	81.6	81.6	43.0	43.0	43.0	Lw	pWay_comp1		0.0	0.0	0.0			20				0.0		(none)			
Main Shop bay door wash 1	~	OPT4unmit_Main_wash1	97.6	97.6	97.6	59.1	59.1	59.1	Lw	pMain_Bdoor_wash1		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door wash 2	~	OPT4unmit_Main_wash2	97.6	97.6	97.6	59.1	59.1	59.1	Lw	pMain_Bdoor_wash2		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door wash 1	~	OPT4mit_Main_wash1	91.6	91.6	91.6	53.1	53.1	53.1	Lw	pMain_Bdoor_wash1		0.0	0.0	0.0			6	60.00	60.00	0.00	0.0		(none)			
Main Shop bay door wash 2	~	OPT4mit_Main_wash2	91.6	91.6	91.6	53.1	53.1	53.1	Lw	pMain_Bdoor_wash2		0.0	0.0	0.0			6	60.00	60.00	0.00	0.0		(none)			
Main Shop bay door Wheel truing 1	~	OPT4unmit_Main_wheel1	119.7	119.7	119.7	81.1	81.1	81.1	Lw	pMain_Bdoor_Wheel1		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door Wheel truing 2	~	OPT4unmit_Main_wheel2	119.7	119.7	119.7	81.1	81.1	81.1	Lw	pMain_Bdoor_Wheel2		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door under car clean 1	~	OPT4unmit_Main_clean1	97.6	97.6	97.6	59.1	59.1	59.1	Lw	pMain_Bdoor_clean1		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door under car clean 2	~	OPT4unmit_Main_clean2	97.6	97.6	97.6	59.1	59.1	59.1	Lw	pMain_Bdoor_clean2		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door under car clean 1	~	OPT4mit_Main_clean1	91.6	91.6	91.6	53.1	53.1	53.1	Lw	pMain_Bdoor_clean1		0.0	0.0	0.0			6	60.00	60.00	0.00	0.0		(none)			
Main Shop bay door under car clean 2	~	OPT4mit_Main_clean2	91.6	91.6	91.6	53.1	53.1	53.1	Lw	pMain_Bdoor_clean2		0.0	0.0	0.0			6	60.00	60.00	0.00	0.0		(none)			
Main Shop bay door bodyshop 1	~	OPT4unmit_Main_body1	106.1	106.1	106.1	67.6	67.6	67.6	Lw	pMain_Bdoor_body1		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door bodyshop 2 - paint	~	OPT4unmit_Main_body2	86.9	86.9	86.9	48.3	48.3	48.3	Lw	pMain_Bdoor_body2		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door bodyshop 1	~	OPT4mit_Main_body1	100.1	100.1	100.1	61.6	61.6	61.6	Lw	pMain_Bdoor_body1		0.0	0.0	0.0			6	60.00	60.00	0.00	0.0		(none)			
Main Shop bay door bodyshop 2 - paint	~	OPT4mit_Main_body2	80.9	80.9	80.9	42.3	42.3	42.3	Lw	pMain_Bdoor_body2		0.0	0.0	0.0			6	60.00	60.00	0.00	0.0		(none)			

Finch MSF - Reference Design Mitigated

Name	M.	ID	Result. PWL			Result. PWL"			Lw / Li			Correction			Sound Reduction		Attenuation	Operating Time			K0	Freq.	Direct.	Moving Pt. Src		
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Evening	Night	R	Area		Day	Special	Night				Number		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	(Hz)		Day	Evening	Night
Main Shop bay door inspection 1	~	OPT4unmit_Main_insp1	106.1	106.1	106.1	67.6	67.6	67.6	Lw	pMain_Bdoor_inspec1		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door inspection 2	~	OPT4unmit_Main_insp2	95.6	95.6	95.6	57.0	57.0	57.0	Lw	pMain_Bdoor_inspec2		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door inspection 1	~	OPT4mit_Main_insp1	100.1	100.1	100.1	61.6	61.6	61.6	Lw	pMain_Bdoor_inspec1		0.0	0.0	0.0			6	60.00	60.00	0.00	0.0		(none)			
Main Shop bay door inspection 2	~	OPT4mit_Main_insp2	89.6	89.6	89.6	51.0	51.0	51.0	Lw	pMain_Bdoor_inspec2		0.0	0.0	0.0			6	60.00	60.00	0.00	0.0		(none)			
Main Shop bay door maintenance and repair 1	~	OPT4unmit_Main_maint1	106.1	106.1	106.1	67.6	67.6	67.6	Lw	pMain_Bdoor_Maint1		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door maintenance and repair 2	~	OPT4unmit_Main_maint2	95.6	95.6	95.6	57.0	57.0	57.0	Lw	pMain_Bdoor_Maint2		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door maintenance and repair 3	~	OPT4unmit_Main_maint3	106.1	106.1	106.1	67.6	67.6	67.6	Lw	pMain_Bdoor_Maint3		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door maintenance and repair 4	~	OPT4unmit_Main_maint4	95.6	95.6	95.6	57.0	57.0	57.0	Lw	pMain_Bdoor_Maint4		0.0	0.0	0.0							0.0		(none)			
Main Shop bay door maintenance and repair 1	~	OPT4mit_Main_maint1	100.1	100.1	100.1	61.6	61.6	61.6	Lw	pMain_Bdoor_Maint1		0.0	0.0	0.0			6	60.00	60.00	0.00	0.0		(none)			
Main Shop bay door maintenance and repair 2	~	OPT4mit_Main_maint2	89.6	89.6	89.6	51.0	51.0	51.0	Lw	pMain_Bdoor_Maint2		0.0	0.0	0.0			6	60.00	60.00	0.00	0.0		(none)			
Main Shop bay door maintenance and repair 3	~	OPT4mit_Main_maint3	100.1	100.1	100.1	61.6	61.6	61.6	Lw	pMain_Bdoor_Maint3		0.0	0.0	0.0			6	60.00	60.00	0.00	0.0		(none)			
Main Shop bay door maintenance and repair 4	~	OPT4mit_Main_maint4	89.6	89.6	89.6	51.0	51.0	51.0	Lw	pMain_Bdoor_Maint4		0.0	0.0	0.0			6	60.00	60.00	0.00	0.0		(none)			
Wayside Bay door1	~	OPT4unmit_Way_Bdoor_1	106.1	106.1	106.1	67.6	67.6	67.6	Lw	pWay_Bdoor1		0.0	0.0	0.0							0.0		(none)			
Wayside Bay door2	~	OPT4unmit_Way_Bdoor_2	95.6	95.6	95.6	57.0	57.0	57.0	Lw	pWay_Bdoor2		0.0	0.0	0.0							0.0		(none)			
Wayside Bay door3	~	OPT4unmit_Way_Bdoor_3	86.9	86.9	86.9	48.3	48.3	48.3	Lw	pWay_Bdoor3		0.0	0.0	0.0							0.0		(none)			
Wayside Bay door4	~	OPT4unmit_Way_Bdoor_4	86.9	86.9	86.9	48.3	48.3	48.3	Lw	pWay_Bdoor4		0.0	0.0	0.0							0.0		(none)			
Wayside Bay door5	~	OPT4unmit_Way_Bdoor_5	86.9	86.9	86.9	48.3	48.3	48.3	Lw	pWay_Bdoor5		0.0	0.0	0.0							0.0		(none)			
Wayside Bay door1	~	OPT4mit_Way_Bdoor_1	106.1	106.1	106.1	67.6	67.6	67.6	Lw	pWay_Bdoor1		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)			
Wayside Bay door2	~	OPT4mit_Way_Bdoor_2	95.6	95.6	95.6	57.0	57.0	57.0	Lw	pWay_Bdoor2		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)			
Wayside Bay door3	~	OPT4mit_Way_Bdoor_3	86.9	86.9	86.9	48.3	48.3	48.3	Lw	pWay_Bdoor3		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)			
Wayside Bay door4	~	OPT4mit_Way_Bdoor_4	86.9	86.9	86.9	48.3	48.3	48.3	Lw	pWay_Bdoor4		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)			
Wayside Bay door5	~	OPT4mit_Way_Bdoor_5	86.9	86.9	86.9	48.3	48.3	48.3	Lw	pWay_Bdoor5		0.0	0.0	0.0				60.00	60.00	0.00	0.0		(none)			

Receiver Table

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Eve	Night	Day	Eve	Night	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(m)		(m)	(m)	(m)
Wheatsheaf_res1		Wheatsheaf_res1	44.9	44.9	45.9	50.5	50.5	45.5				4.50	r	618866.21	4846297.92	183.84
Wheatsheaf_res2		Wheatsheaf_res2	45.1	45.9	45.7	50.5	51.5	45.5				4.50	r	618791.83	4846274.04	184.25
Yorkgate_appt		Yorkgate_appt	48.1	48.2	49.2	54.5	58.5	50.5				11.50	r	619043.60	4846353.90	191.50
Yorkgate_res		Yorkgate_res	49.5	49.5	50.2	54.5	58.5	50.5				4.50	r	619099.19	4846368.55	185.40
ElanaDr		ElanaDr	61.3	61.3	61.8	67.5	68.5	63.5				4.50	r	619077.44	4845891.61	181.46
Pelican_nursing		Pelican_nursing	61.1	61.1	62.1	67.5	68.5	63.5				7.50	r	619010.75	4845864.44	184.47
Pelican_medical		Pelican_medical	57.7	57.8	58.9	67.5	68.5	63.5				16.00	r	618882.50	4845820.58	193.27
NorFinch_medical		NorFinch_medical	61.1	62.2	60.4	67.5	68.5	63.5				10.00	r	618764.75	4845861.15	187.45
NorFinch_school		NorFinch_school	49.0	49.5	48.1	50.5	51.5	0.0				1.50	r	618688.60	4846053.36	180.45

Barrier Table

Name	M.	ID	Absorption		Z-Ext.	Cantilever		Height			
			left	right		horz.	vert.	Begin		End	
					(m)	(m)	(m)	(m)		(m)	
	~	OPT1mit_						8.00	r		
		Refdmit_						6.00	r		
		Refdmit_						5.00	r		
		Refdmit_						7.00	r		
	~	OPT1mit_						4.00	r		
	~	OPT2mit_						4.00	r		
	~	OPT2mit_						5.00	r		
	~	OPT3mit_						4.00	r		
	~	OPT3mit_						6.50	r		
	~	OPT4mit_						9.00	r		
	~	OPT4mit_						4.50	r		
	~	OPT4mit_						7.00	r		
	~	OPT4mit_						6.00	r		
		Refdmit_						2.00	r		

Sound Power Spectra

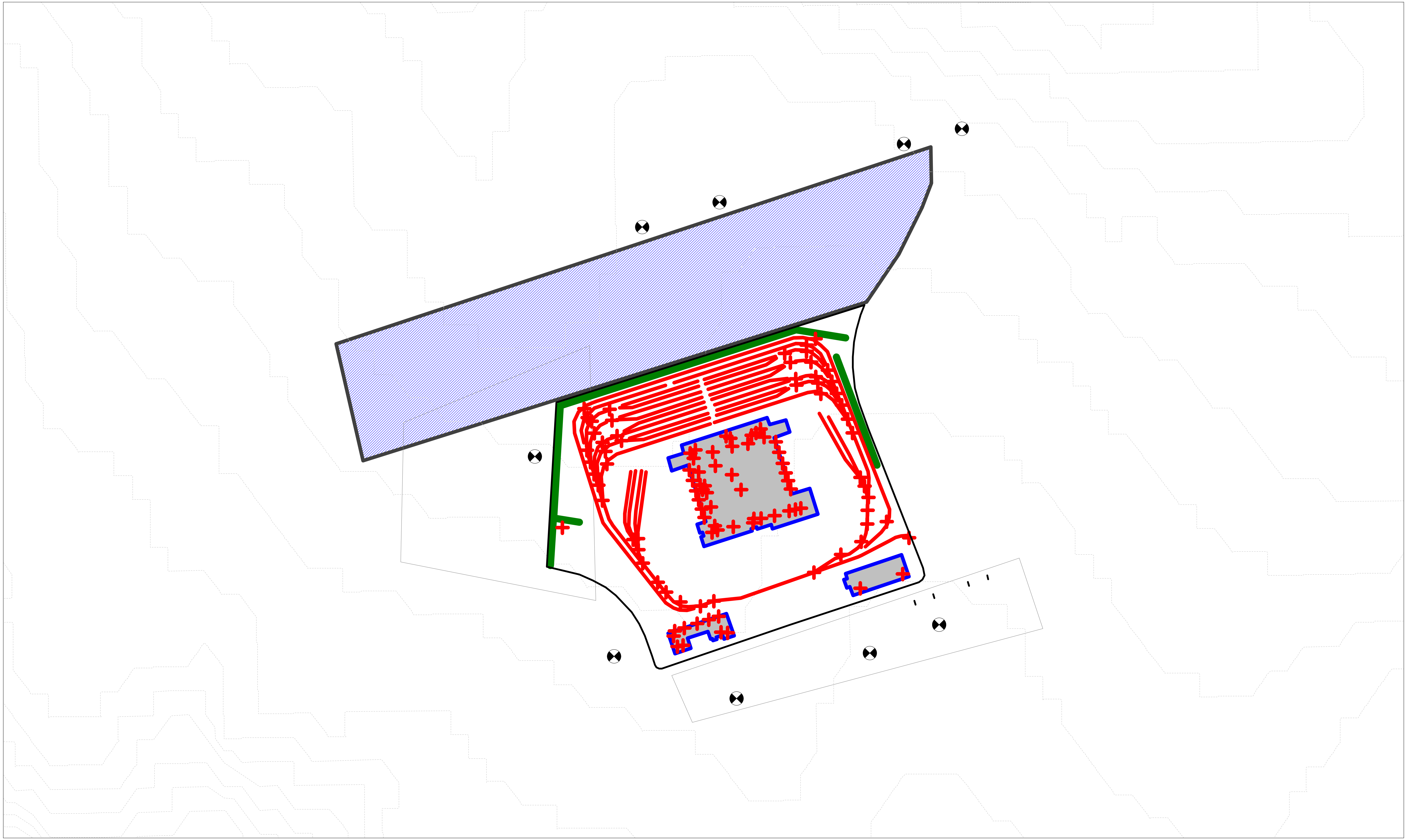
Finch MSF - Reference Design Mitigated

Name	ID	Type	Oktave Spectrum (dB)												Source
			Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	
0	0	Li		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0	9.5	0
Main Shop heating ventilation 1 ()	pMain_HV1	Lw		0.0	97.9	97.9	87.9	82.9	80.9	75.9	70.9	65.9	87.3	101.3	(ASHRAE PREDICT) - (S)
Main Shop heating ventilation 2 ()	pMain_HV2	Lw		0.0	97.9	97.9	87.9	82.9	80.9	75.9	70.9	65.9	87.3	101.3	(ASHRAE PREDICT) - (S)
Main Shop heating ventilation 3 ()	pMain_HV3	Lw		0.0	97.9	97.9	87.9	82.9	80.9	75.9	70.9	65.9	87.3	101.3	(ASHRAE PREDICT) - (S)
Main Shop heating ventilation 4 ()	pMain_HV4	Lw		0.0	99.0	99.0	89.0	84.0	82.0	77.0	72.0	67.0	88.4	102.4	(ASHRAE PREDICT) - (S)
Main Shop heating ventilation 5 ()	pMain_HV5	Lw		0.0	102.0	102.0	92.0	87.0	85.0	80.0	75.0	70.0	91.4	105.4	(ASHRAE PREDICT) - (S)
Main Shop heating ventilation 6 ()	pMain_HV6	Lw		0.0	101.7	101.7	91.7	86.7	84.7	79.7	74.7	69.7	91.1	105.0	(ASHRAE PREDICT) - (s)
Main Shop heating ventilation 7 ()	pMain_HV7	Lw		0.0	101.7	101.7	91.7	86.7	84.7	79.7	74.7	69.7	91.1	105.0	(ASHRAE PREDICT) - (s)
Main Shop - Makeup Air 1 ()	pMain_MAU1	Lw		0.0	99.0	99.0	89.0	84.0	82.0	77.0	72.0	67.0	88.4	102.4	(ASHRAE PREDICT) - (S)
Main Shop - Makeup Air 2 ()	pMain_MAU2	Lw		0.0	94.0	94.0	84.0	79.0	77.0	72.0	67.0	62.0	83.4	97.4	(ASHRAE PREDICT) - (S)
Mainshop Makeup Air 3 ()	pMain_MAU3	Lw		0.0	96.3	96.3	86.3	81.3	79.3	74.3	69.3	64.3	85.7	99.7	(ASHRAE PREDICT) - (S)
Operations Company AC1 ()	pOpsCo_AC1	Lw		0.0	100.6	98.6	105.6	103.6	102.6	99.6	93.6	89.6	107.0	110.3	(ASHRAE PREDICT) - (S)
Operations Company AC2 ()	pOpsCo_AC2	Lw		0.0	100.6	98.6	105.6	103.6	102.6	99.6	93.6	89.6	107.0	110.3	(ASHRAE PREDICT) - (S)
Main Shop - AC1 ()	pMain_AC1	Lw		0.0	85.2	83.2	90.2	88.2	87.2	84.2	78.2	74.2	91.6	95.0	(ASHRAE PREDICT) - (S)
Main Shop - AC2 ()	pMain_AC2	Lw		0.0	79.4	77.4	84.4	82.4	81.4	78.4	72.4	68.4	85.8	89.2	(ASHRAE PREDICT) - (S)
Main Shop - AC3 ()	pMain_AC3	Lw		0.0	79.4	77.4	84.4	82.4	81.4	78.4	72.4	68.4	85.8	89.2	(ASHRAE PREDICT) - (S)
Main Shop - AC4 ()	pMain_AC4	Lw		0.0	79.8	77.8	84.8	82.8	81.8	78.8	72.8	68.8	86.2	89.6	(ASHRAE PREDICT) - (S)
Main Shop - EF1 ()	pMain_EF1	Lw		0.0	74.0	74.0	75.0	68.0	63.0	57.0	53.0	48.0	70.4	79.6	(ASHRAE PREDICT) - (S)
Main Shop - EF2 ()	pMain_EF2	Lw		0.0	70.7	70.7	71.7	64.7	59.7	53.7	49.7	44.7	67.1	76.3	(ASHRAE PREDICT) - (S)
Main Shop - EF3 ()	pMain_EF3	Lw		0.0	69.7	69.7	70.7	63.7	58.7	52.7	48.7	43.7	66.1	75.3	(ASHRAE PREDICT) - (S)
Main Shop - EF4 ()	pMain_EF4	Lw		0.0	63.2	63.2	64.2	57.2	52.2	46.2	42.2	37.2	59.6	68.8	(ASHRAE PREDICT) - (S)
Main Shop - EF5 ()	pMain_EF5	Lw		0.0	63.2	63.2	64.2	57.2	52.2	46.2	42.2	37.2	59.6	68.8	(ASHRAE PREDICT) - (S)
Main Shop - EF6 ()	pMain_EF6	Lw		0.0	63.2	63.2	64.2	57.2	52.2	46.2	42.2	37.2	59.6	68.8	(ASHRAE PREDICT) - (S)
Main Shop - EF7 ()	pMain_EF7	Lw		0.0	78.8	78.8	79.8	72.8	67.8	61.8	57.8	52.8	75.2	84.3	(ASHRAE PREDICT) - (S)
Main Shop - EF8 ()	pMain_EF8	Lw		0.0	75.1	75.1	76.1	69.1	64.1	58.1	54.1	49.1	71.5	80.7	(ASHRAE PREDICT) - (S)
Main Shop - EF9 ()	pMain_EF9	Lw		0.0	63.2	63.2	64.2	57.2	52.2	46.2	42.2	37.2	59.6	68.8	(ASHRAE PREDICT) - (S)
Main Shop - EF10 ()	pMain_EF10	Lw		0.0	63.2	63.2	64.2	57.2	52.2	46.2	42.2	37.2	59.6	68.8	(ASHRAE PREDICT) - (S)
Main Shop - EF11 ()	pMain_EF11	Lw		0.0	63.2	63.2	64.2	57.2	52.2	46.2	42.2	37.2	59.6	68.8	(ASHRAE PREDICT) - (S)
Main Shop - EF12 ()	pMain_EF12	Lw		0.0	63.2	63.2	64.2	57.2	52.2	46.2	42.2	37.2	59.6	68.8	(ASHRAE PREDICT) - (S)
Main Shop - EF13 ()	pMain_EF13	Lw		0.0	85.0	85.0	86.0	79.0	74.0	68.0	64.0	59.0	81.4	90.6	(ASHRAE PREDICT) - (S)
Main Shop - EF14 ()	pMain_EF14	Lw		0.0	80.0	80.0	81.0	74.0	69.0	63.0	59.0	54.0	76.4	85.6	(ASHRAE PREDICT) - (S)
Main Shop - EF15 ()	pMain_EF15	Lw		0.0	84.9	84.9	85.9	78.9	73.9	67.9	63.9	58.9	81.3	90.5	(ASHRAE PREDICT) - (S)
Maintenance of Way - AC1 ()	pWay_AC1	Lw		0.0	85.2	83.2	90.2	88.2	87.2	84.2	78.2	74.2	91.6	95.0	(ASHRAE PREDICT) - (S)
Maintenance of Way - AC2 ()	pWay_AC2	Lw		0.0	76.7	74.7	81.7	79.7	78.7	75.7	69.7	65.7	83.1	86.5	(ASHRAE PREDICT) - (S)
Maintenance of Way - Heating ventilation 1 ()	pWay_HV1	Lw		0.0	102.0	102.0	92.0	87.0	85.0	80.0	75.0	70.0	91.4	105.4	(ASHRAE PREDICT) - (S)
Maintenance of Way - Heating ventilation 2 ()	pWay_HV2	Lw		0.0	93.5	93.5	83.5	78.5	76.5	71.5	66.5	61.5	82.9	96.8	(ASHRAE PREDICT) - (S)
Maintenane shop paint booth 1 ()	pMain_PB1	Lw		0.0	93.6	93.6	94.6	87.6	82.6	76.6	72.6	67.6	90.0	99.2	(ASHRAE PREDICT) - (S)
Main Shop - Compressor 1 ()	pMain_comp1	Lw (c)		96.0	91.0	91.0	90.0	93.0	96.0	96.0	94.0	91.0	101.6	103.3	(~) - (S)
Maintenance of Way - Compressor 1 ()	pWay_comp1	Lw (c)		96.0	91.0	91.0	90.0	93.0	96.0	96.0	94.0	91.0	101.6	103.3	(~) - (S)
Main Shop - Compressor 2 ()	pMain_Comp2	Lw (c)		96.0	91.0	91.0	90.0	93.0	96.0	96.0	94.0	91.0	101.6	103.3	(~) - (S)
Main shop bay door - Wash 1 ()	pMain_Bdoor_wash1	Lw (c)		104.5	101.0	93.5	89.8	89.3	94.3	92.0	84.5	75.6	97.6	106.9	(~) - (S)
Main shop bay door - Wash 2 ()	pMain_Bdoor_wash2	Lw (c)		104.5	101.0	93.5	89.8	89.3	94.3	92.0	84.5	75.6	97.6	106.9	(~) - (S)
Main shop bay door - wheel truing 1 ()	pMain_Bdoor_Wheel1	Lw (c)		101.9	107.9	97.9	95.9	94.9	101.9	117.9	107.9	103.9	119.7	119.1	(~) - (T)
Main shop bay door - wheel truing 2 ()	pMain_Bdoor_Wheel2	Lw (c)		101.9	107.9	97.9	95.9	94.9	101.9	117.9	107.9	103.9	119.7	119.1	(~) - (T)
Main shop bay door - unterior undercar clean 1 ()	pMain_Bdoor_clean1	Lw (c)		104.5	101.0	93.5	89.8	89.3	94.3	92.0	84.5	75.6	97.6	106.9	(~) - (S)
Main shop bay door - unterior undercar clean 2 ()	pMain_Bdoor_clean2	Lw (c)		104.5	101.0	93.5	89.8	89.3	94.3	92.0	84.5	75.6	97.6	106.9	(~) - (S)
Main shop bay door - body shop 1 ()	pMain_Bdoor_body1	Lw (c)		88.7	86.9	88.4	84.6	86.5	95.2	102.2	98.4	99.5	106.1	105.8	(~) - (I)
Main shop bay door - body shop 2 - paint booth side ()	pMain_Bdoor_body2	Lw (c)		88.9	88.4	84.6	80.8	80.4	81.7	81.5	76.2	74.5	86.9	93.7	(~) - (S)
Main Shop bay door - inspection 1 ()	pMain_Bdoor_inspec1	Lw (c)		88.7	86.9	88.4	84.6	86.5	95.2	102.2	98.4	99.5	106.1	105.8	(~) - (I)
Main Shop bay door - inspection 2 ()	pMain_Bdoor_inspec2	Lw (c)		82.4	82.6	79.1	83.3	88.3	92.3	86.8	85.8	87.2	95.6	96.5	(~) - (S)
Main Shop-bay door - maintenance and repair 1 ()	pMain_Bdoor_Maint1	Lw (c)		88.7	86.9	88.4	84.6	86.5	95.2	102.2	98.4	99.5	106.1	105.8	(~) - (I)
Main Shop-bay door - maintenance and repair 2 ()	pMain_Bdoor_Maint2	Lw (c)		82.4	82.6	79.1	83.3	88.3	92.3	86.8	85.8	87.2	95.6	96.5	(~) - (S)
Main Shop-bay door - maintenance and repair 3 ()	pMain_Bdoor_Maint3	Lw (c)		88.7	86.9	88.4	84.6	86.5	95.2	102.2	98.4	99.5	106.1	105.8	(~) - (I)
Main Shop-bay door - maintenance and repair 4 ()	pMain_Bdoor_Maint4	Lw (c)		82.4	82.6	79.1	83.3	88.3	92.3	86.8	85.8	87.2	95.6	96.5	(~) - (S)
Wayside bay door 1 ()	pWay_Bdoor1	Lw (c)		88.7	86.9	88.4	84.6	86.5	95.2	102.2	98.4	99.5	106.1	105.8	(~) - (I)
Wayside bay door 2 ()	pWay_Bdoor2	Lw (c)		82.4	82.6	79.1	83.3	88.3	92.3	86.8	85.8	87.2	95.6	96.5	(~) - (S)
Wayside bay door 3 ()	pWay_Bdoor3	Lw (c)		88.9	88.4	84.6	80.8	80.4	81.7	81.5	76.2	74.5	86.9	93.7	(~) - (S)
Wayside bay door 4 ()	pWay_Bdoor4	Lw (c)		88.9	88.4	84.6	80.8	80.4	81.7	81.5	76.2	74.5	86.9	93.7	(~) - (S)
Wayside bay door 5 ()	pWay_Bdoor5	Lw (c)		88.9	88.4	84.6	80.8	80.4	81.7	81.5	76.2	74.5	86.9	93.7	(~) - (S)
LRT_Movements ()	pLRTmovement	Lw (c)		98.0	104.0	94.0	92.0	91.0	98.0	104.0	104.0	100.0	109.1	110.2	(~) - (S)
Crossover event ()	pCrossover	Lw (c)		86.9	92.9	82.9	80.9	79.9	86.9	92.9	92.9	88.9	97.9	99.1	(~) - (I)
Transformer ()	pTransformer	Lw		97.3	103.3	105.3	100.3	100.3	94.3	89.3	84.3	77.3	100.6	109.3	(~) - (T)

Finch MSF - Reference Design Mitigated

Name	ID	Type	Oktave Spectrum (dB)												Source
			Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	
Wheel squeel ()	pWheelSqueal	Lw (c)		75.4	81.4	71.4	69.4	68.4	75.4	91.4	81.4	77.4	93.1	92.5	(~) - (T)
Generator 1 - 800 kW ()	pGen800_1	Lw	A	0.0	93.4	105.4	107.7	107.6	108.1	105.1	108.0	109.1	116.0	124.9	(MANUFACTURER) - (S)
Generator 2 - 800 kW ()	pGen800_2	Lw	A	0.0	93.4	105.4	107.7	107.6	108.1	105.1	108.0	109.1	116.0	124.9	(MANUFACTURER) - (S)
		Li											-99.9	-99.9	
LRT_Movements 20 km/hr ()	pLRTmovement20	Lw (c)		92.0	98.0	88.0	86.0	85.0	92.0	98.0	98.0	94.0	103.0	104.2	(~) - (S)
Crossover event 20 km/hr ()	pCrossover20	Lw (c)		80.9	86.9	76.9	74.9	73.9	80.9	86.9	86.9	82.9	91.9	93.1	(~) - (I)
LRT_Movements 10 km/hr ()	pLRTmovement10	Lw (c)		86.0	92.0	82.0	80.0	79.0	86.0	92.0	92.0	88.0	97.0	98.1	(~) - (S)
Crossover event 10 km/hr ()	pCrossover10	Lw (c)		77.0	83.0	73.0	71.0	70.0	77.0	83.0	83.0	79.0	88.1	89.2	(~) - (I)
Crossover event no Penalty ()	pCrossover_noPen	Lw (c)		76.9	82.9	72.9	70.9	69.9	76.9	82.9	82.9	78.9	87.9	89.1	(~) - (I)
Crossover event no Penalty 60 kkm/hr ()	pCrossover60_noPen	Lw (c)		80.5	86.5	76.5	74.5	73.5	80.5	86.5	86.5	82.5	91.5	92.6	(~) - (I)
Wheel squeel - no penalty ()	pWheelSqueal_nopen	Lw (c)		75.4	81.4	71.4	69.4	68.4	75.4	91.4	81.4	77.4	93.1	92.5	(~) - (T)

Example Model Space - Preferred Reference Design Mitigated



Appendix D

Appendix D: Example Vibration Calculation

U.S. Federal Transit Administration
Transit Noise and Vibration Impact Assessment

"FTA General Vibration Assessment 2006"

Project No.	60318592
Project Name	Finch LRT MSF

Case Example calculation

Note: All distances are in ft and All vibration levels in dB are VdB re: 1 µin/s

1. Factors Affecting Vibration Source (Source Factor)

1.1. Train/Vehicle Type and Speed

				Resulting Adjustments
Train Type	L	(F) reight, (L)RT/Rapid Transit, (B)us		
Train Speed	12.4	mph 20 KPH		-12.1

1.2. Train/Vehicle Type and Parameters (not additive, apply greatest value only)

Stiff Suspension?	n	(y/n, usually n) yes when vertical resonance frequency greater than 15 Hz	0	
Resilient Wheels?	n	No effect on vibration, included to match standard (y/n)	0	0.0
Worn wheels or wheels with flats?	n	(y/n, No for new or well maintained system)	0	

If both the wheels and the track are worn, only one adjustment should be used.

1.3. Track Conditions (not additive, apply greatest value only)

Worn or Corrugated track?	n	Worn track (y/n, usually n for new or well maintained system)	0	
Special Trackwork?	y	Crossovers, diamonds, frogs, etc. (y/n)	10	10.0
Jointed Track or Uneven Road Surfaces?	CWR	Jointed Track (J), Continuous Welded Rail (CWR), or Rough Road	0	

1.4. Track Treatments (not additive, apply greatest value only)

Floating slab trackbed?	n	Concrete floating slab on spring isolators (y/n)	0	
Ballast mats?	n	Rubber mat placed over concrete, under the ballast (y/n)	0	0
High Resilience Fasterners?	n	Used with concrete track slabs (y/n)	0	
Resiliently Supported Ties?	n	Concrete ties on rubber blocks, with resilient fasteners (y/n)	0	

2. Factors Affecting Vibration Path (Path Factor)

2.1. Track Configuration (not additive, apply greatest value only)

2.1.1. Type of Transit Stucture

Relative to at-grade tie & ballast:

Elevated Structure?	n	On berm or bridge (y/n)	0	
In open cut?	n	No effect on vibration, included to match standard (y/n)	0	

Mutually
May also both be "n"

Relative to bored subway tunnel in soil:

Station	n	0	
Cut and Cover	n	0	0
Rock-Based	n	0	

2.2. Ground-Borne Propagation Effects

2.2.1. Geologic Condition that Promote Efficient Vibration Propagation

Efficient propagation in soil

Efficient propagation in soil?	y	Accounts for clay soils or other mediums with efficient propagation (y/n)	10	
Propagation in Rock Layer?	n	Accounts for lower attenuation with distance in rock versus soil (y/n)		10
If y, Distance (50 ft, 100 ft, 150 ft, 200 ft)=	200	ft	0	

Mutually
exclusive
choices
May also both be "n"

Base Vibration Level at 10 ft	81.5	VdB, FTA base curve levels at 10 ft from track
Total Adjustments	7.9	VdB
Adjusted Vibration Level at 10 ft	**89.4**	VdB, including train type and track type adjustements above.

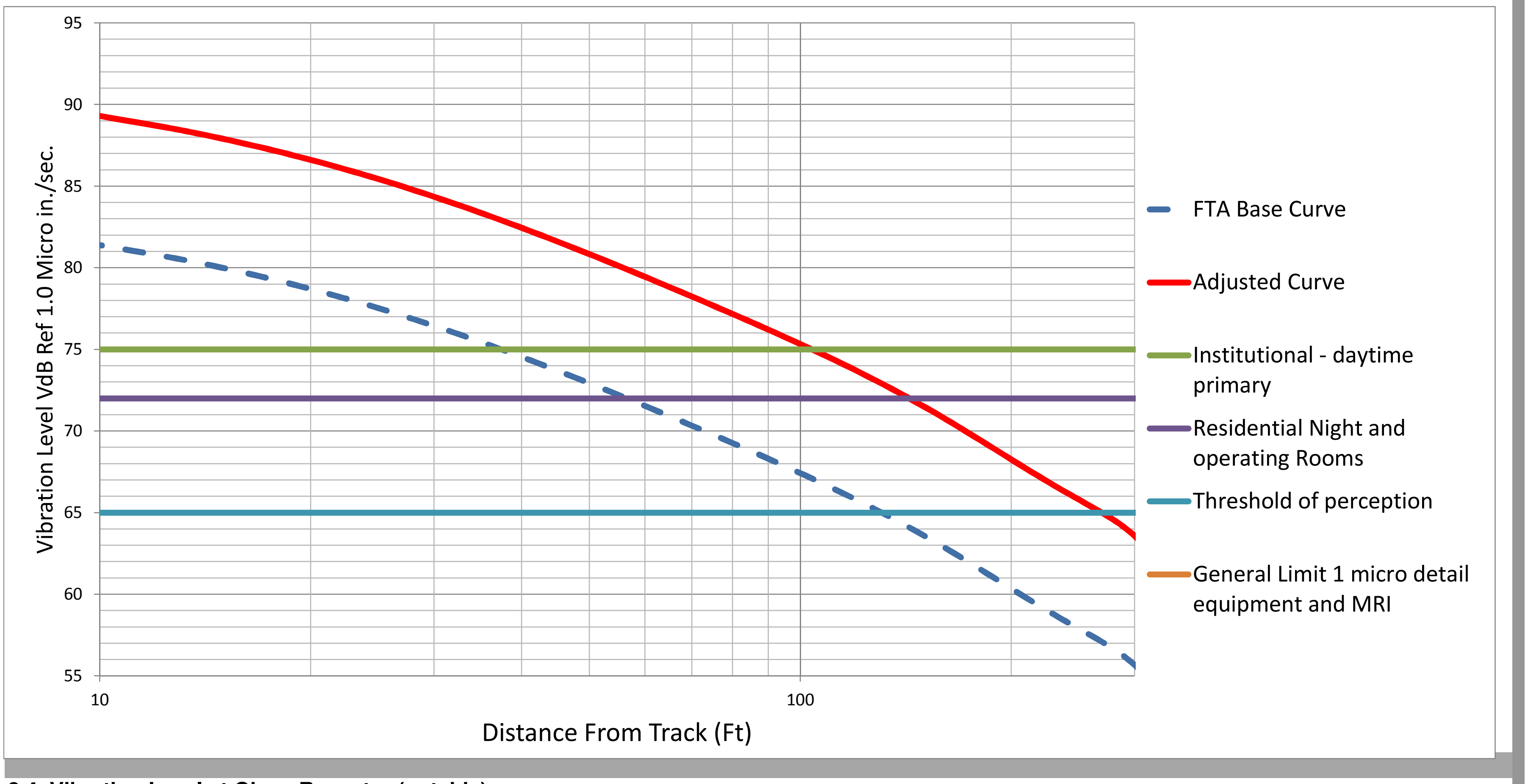
0.750 mm/sec (RMS)

2.3. Distance to Meet Guideline Limits

ISO 2631-2 Guidelines for Whole Body Vibration in Buidlings

Space	Limit VdB	Limit mm/sec	Limit µin/sec	Distance (ft)	Distance (m)	Req'd Mit @ 60 m
Institutional - daytime primary	75.0	0.14	5623	105.1	32.0	0.0 VdB
Residential Night and operating Rooms	72.0	0.10	3981	144.5	44.0	0.0
Threshold of perception	65.0	0.05	1778	272.5	83.0	3.5
General Limit 1 micro detail equipment and MRI	54.0	0.01	501	370.9	113.0	14.5

Distances greater than 300 ft are extrapolated
Provides the distance past which the guideline limits are met with no building effects
The limits are inside the building levels



2.4. Vibration Level at Given Receptor (outside)

Source-Receiver distance	196.850394	ft, from track to receptor (DISTANCE should be less than 300 ft)	-20.9
Total distance and path adjustments	-20.9	VdB (Distances >300ft are extrapolated through curve fitting) 60 m	
Vibration Level at distance	**68.5**	VdB **0.068** mm/s r.m.s.	

Appendix D

Air Quality Assessment Report

Metrolinx

Finch West Light Rail Transit Maintenance and Storage Facility Final Revised Air Quality Assessment Report

Prepared by:

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Project Number:

60318592

Date:

July 24, 2015

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Revision Log

Revision #	Revised By	Date	Issue / Revision Description
1	Matt Costigane	July 24, 2015	Addressed comments from MX
2	Danielle Arsenault	September 25, 2015	Addressed comments from MOECC
3	Danielle Arsenault	October 5, 2015	Clarification of Chromium VI emission rate calculation (Section 5.2.3) and Air Quality Modelling Results (Table 6-2)

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1. Introduction

1.1 Project Overview

AECOM Canada Ltd. (AECOM) was retained by Metrolinx to conduct an air quality assessment for the proposed Finch West Light Rail Transit (LRT) Maintenance and Storage Facility (MSF) located in the City of Toronto, Ontario. The focus of the assessment was to predict impacts at the nearby air-sensitive receptors from parking lot emissions as well as other stationary emission sources onsite.

1.2 Purpose of Project

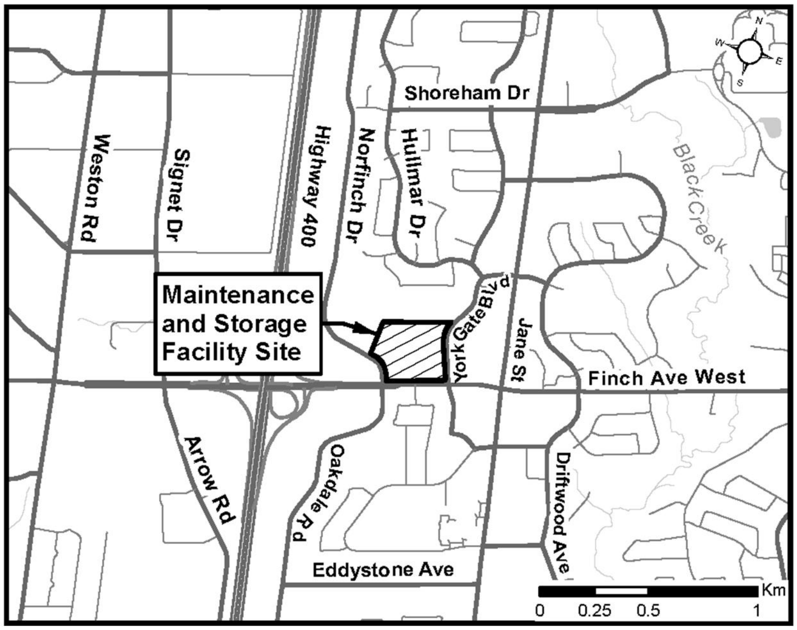
The purpose of the Finch West MSF(the Project) is to provide maintenance service and storage tracks for overnight storage of the new light rail vehicles (LRVs) servicing the Finch West LRT system and proposed future Jane Street LRT, and a main repair shop facility to maintain the new LRVs in a state of good repair. Transit service for the community will be enhanced through the implementation of the Project and the overall Finch LRT System.

Typical features of a MSF include an electrical substation, maintenance of way (MoW) building, storage for LRVs (including an Outdoor Storage Yard with capacity for LRVs and Main Repair Shop Facility with capacity for LRVs, that will also be used to service LRVs), and a motor vehicle parking lot for employees.

1.3 Project Site

The Project site is located in the northern portion of the City of Toronto, within the Black Creek Neighbourhood of Ward 8 (York West). The site is approximately eight (8) hectares (ha) in size and situated on the north side of Finch Avenue West between Norfinch Drive and York Gate Boulevard. The site is east of Highway 400 and west of Jane Street. The northern property limit is bounded by a high-voltage electrical corridor right-of-way and the northwest property limit is bounded by an adult education/continuing learning secondary school. The site is currently vacant and owned by Metrolinx. **Figure 1** below illustrates the Finch West MSF site within the City of Toronto.

Figure 1. Finch West MSF Site



1.4 Study Area

The study area to assess the local air quality conditions extends one kilometre from the MSF property. This distance is based on the MOECC "Procedure for Preparing an ESDM Report, Version 3.0" dated March 2009 guidance document which notes that the modelled ground level maxima from shorter stacks (10 to 20 m) is expected to occur within one kilometre of the site's property boundary.

1.5 Air Quality Review of Surrounding Facilities

An inventory of facilities with air emissions within the study area was conducted to consider their potential impact to the existing local and regional air quality from secondary sources. The quantity and type of the air emissions from these facilities were collected by accessing Environment Canada's National Pollutant Release Inventory (NPRI). Further, a review of significant facilities with existing Environmental Compliance Approvals (ECA) (formerly Certificates of Approval (C of A)) issued by the MOECC within the study area was conducted.

Two industrial facilities which reported air emissions to the NPRI were identified within the study area, namely:

- Crown Metal Packaging – Fabricated Metal Product manufacturing facility located at 21 Fenmar Drive in Toronto, Ontario
- Canadian Linen and Uniform Service – Dry Cleaning and Laundry located at 75 Norfinch Drive, Toronto, Ontario.

The air emission data was collected for these two facilities for a five year period (2008-2012), revealing that the facilities exceeded the reporting thresholds for the following air contaminants:

- $PM_{2.5}$
- 2-Butoxyethanol
- n-Butyl Alcohol
- VOCs.

A summary of the air emissions reported from the two industrial facilities are presented in **Table 1-1**.

Table 1-1: Summary of Air Emissions from Nearby Industrial Sources (2008-2012)

NPRI Substance	CAS #	Air Emissions in Tonnes (total of 2 facilities)						
		2008	*2009*	*2010*	*2011*	*2012*	*Average*	*Maximum*
2-Butoxyethanol	111-76-2	31.00	33.00	34.00	35.00	33.00	33.20	35.00
n-Butyl Alcohol	71-36-3	24.00	25.00	26.00	24.00	24.00	24.60	26.00
$PM_{2.5}$	NA-PM2.5	-	-	-	0.42	0.41	0.42	0.42
VOC	NA-VOC	217.00	229.00	229.0	222.99	218.00	223.0	229.00

Note: " - " No Data

The emissions from these two facilities may contribute to the local and regional air quality.

Facilities with MOECC Environmental Compliance Approvals (ECAs)

As presented in **Table 1-2**, there are four facilities that currently hold a provincial C of A within the study area. These facilities consist of two hotel buildings, a police station and a commercial building. The contaminants emitted from these facilities are products of natural gas and diesel fuel combustion from comfort and space heating equipment and emergency generators.

Table 1-2: Nearby Significant Facilities with an ECA

C of A Number	Facility	Facility Location	Air Emission Sources	Contaminants
9495-5HWH9Q	Travel Lodge Hotel	50 Norfinch Drive, Toronto, Ontario	• Five natural gas-fired domestic water heaters, one natural gas-fired pool water heater, one natural gas-fired whirlpool water heater, two natural gas-fired air make-up units and two natural gas-fired heating, ventilation and air conditioning units, having a total maximum heat input of 4,298,070 kilojoules per hour; and • One diesel-fired standby generator set, having a rating of 33 kilowatts, to provide electrical power during emergency situations.	• NOx and other products of diesel fuel and natural gas combustion (PM. PM_{10}, $PM_{2.5}$, SO_2, VOC)
0120-5HW2N4	Holiday Inn Express	30 Norfinch Drive, Toronto, Ontario	• One natural gas-fired air make-up unit and four natural gas-fired domestic hot water boilers, having a total maximum heat input of 2,880,150 kilojoules per hour.	• NOx and other products of natural gas combustion (PM. PM_{10}, $PM_{2.5}$, SO_2, VOC)
4136-53VPUX	Toronto Police Services 31 Division Building	40 Norfinch Drive, Toronto, Ontario	• One standby diesel generator set, having a rating of 300 kW, to provide power to the Toronto Police Service 31 Division building during emergency situations.	• NOx and other products of diesel fuel combustion (PM. PM_{10}, $PM_{2.5}$, SO_2, VOC)
7370-6NYQSN	HTS Engineering	115 Norfinch Drive, Toronto, Ontario	• One standby diesel generator set, having a rating of 50 kW, to provide power during emergency situations.	• NOx and other products of diesel fuel combustion (PM. PM_{10}, $PM_{2.5}$, SO_2, VOC)

The sources and activities at these facilities are not expected to emit significant quantities of contaminants and will incur minimal impact on the local and regional air quality.

2. Contaminants of Concern

Potential sources of air emissions during construction consist of fugitive dust from material transfer and excavation activities and combustion by-product emissions from diesel and gasoline combustion equipment.

For the operations phase, the ambient air quality was assessed within one kilometre from the property line. Advanced air dispersion modelling predicted the maximum concentration of the contaminants of concern using five years of regional meteorological data. The maximum air emissions scenario from the facility assumed 24 hour/day, 7 days/week operation with the simultaneous operation of all anticipated equipment and processes which release air emissions.

Emissions estimates for the facility are based on very similar MSFs that have already undergone or are currently undergoing a review by MOECC. These facilities are similar in size, scale, and nature of activities and throughputs. The facilities are:

- TTC Leslie Barns Streetcar MSF; and
- Region of Waterloo LRT MSF.

A summary of the Contaminants of Interest are presented in Table 2-1. Benzo (a) pyrene which is typically a potential compound of concern for transit focused air quality assessments has not been included for the parking lot emissions as it is understood to be negligible from this scale and type of source.

Table 2-1: Contaminants of Interest

Type	Contaminant
Criteria Air Contaminants (CAC's)	Nitrogen Oxides
	Carbon Monoxide
	Total Particulate Matter (TPM)
	Particulate Matter <2.5 microns (PM2.5)
Volatile Organic Compounds (VOC's)	1,3-Butadiene
	2-ethyl Acetate
	2,4-pentanedione
	Acetaldehyde
	Acrolein
	Benzene
	Butyl Acetate
	Formaldehyde
	Ketone
	n-Pentyl propionate
Metals	Chromium (VI) (PM-10 Faction)

2.1 Emissions from Construction

The implementation of the preferred design concept will result in the disturbance of the full MSF property (20 ha). During construction of the facility, nuisance dust will be generated at the construction sites. Sources of dust will include material handling and construction site activities by on-site equipment and vehicles (refer to **Section 2** of the EPR for expected on-site equipment). Material handling will include activities such as excavation, stockpiling and transfer to truck beds for hauling. Vehicles may also “track out” dirt onto public roads and generate dust. Releases of combustion emissions are expected from the diesel and gasoline-fired equipment and vehicles on-site.

2.2 Emissions from Motor Vehicles

Since this is a LRT facility there will not be any vehicle emissions, mobile or stationary, from rail cars as there are no combustion engines. There will be vehicle emissions from employee and contractor automobiles associated with the facility parking lot movements.

The contaminants of interest from motor vehicles have largely been determined by scientists and engineers with United States and Canadian government agencies such as the U.S. Environmental Protection Agency (EPA), the Ontario Ministry of the Environment and Climate Change (MOECC), Environment Canada (EC), Health Canada (HC), and the Ontario Ministry of Transportation (MTO). These contaminants are primarily emitted due to fuel combustion, brake wear, tire wear, the breakdown of dust on the roadway.

The contaminants of interest from motor vehicles are categorized as Criteria Air Contaminants (CACs) and Volatile Organic Compounds (VOCs). The contaminants emitted during fuel combustion include all of the CACs and VOCs, and the contaminants emitted from brake wear, tire wear, and breakdown of road dust include the particulates. A summary of these contaminants are provided in the **Table 2-2**.

Table 2-2: Motor Vehicle Contaminants of Interest

Criteria Air Contaminants (CACs)	Volatile Organic Compounds (VOCs)
• Nitrogen Dioxide (NO2) • Carbon Monoxide (CO) • Fine Particulate Matter (PM2.5) • Coarse Particulate Matter (PM10)	• Acetaldehyde • Acrolein • Benzene • 1,3-Butadiene • Formaldehyde

These contaminants have been selected for this assessment due to their potential effect on human health or the environment.

2.3 Emissions from Comfort Heating Equipment and Standby Diesel Generators

Emissions from the combustion of natural gas used for comfort heating in three buildings on-site: Main Repair Shop, Operations Company Building and Maintenance of Way Building. Two emergency generators each with a rating of 800 kilowatts per hour (kW/hr) will also be on-site to be used in the event of power failure. Both units would be tested monthly and will generate emissions of nitrogen oxides and other products of combustion.

Due to the nature of the operations, no heaters and boilers are expected to be present on-site which are subject to Guideline A-9 (>10 MMBtu).

2.4 Emissions from Maintenance Welding

There will be maintenance welding activities at the proposed facility. The welding is expected to be infrequent and consume a relatively low quantity of rod/wire. The contaminants of concern associated with the maintenance welding activities include particulate matter and metals from the welding fumes.

2.5 Emissions from Paint Booth, Servicing and Other Maintenance

The proposed facility will include a paint booth for LRV body repairs and touch-ups. Contaminants of concern from the paint booth include several chemicals, including VOCs and particulate matter. The paint booth will have Paint Arrestor Pads for control and removal of product solids.

Servicing and maintenance activities at the Main Repair Shop will have the potential to produce emissions of nitrogen oxides (NOx), particulate matter (PM) and volatile organic compounds (VOCs). These activities include washing and cleaning services, compressed air blow-down, sand dispensing, body repairs and vehicle painting. The washing activities will be with water-based cleansers, will not be performed continuously, and are not anticipated to be vented to the atmosphere. Therefore, this activity is expected to be an insignificant source of contaminants.

2.6 Emissions from Dust Collectors

The compressed air cleaning of the traction motors and selected roof-mounted components will generate dust emissions that would be controlled with a ventilation/dust collection system. Additionally, the sandboxes on the light rail vehicles (LRVs) will be filled using a pneumatic sanding system attached to a sand storage silo. Emissions of particulate matter (dust) would be controlled using a filter or dust collector system.

2.7 Activities with Insignificant Emissions

There are two operations which are specifically being addressed with insignificant emissions. These include:

1. Storage tank operation; and
2. Wheel truing operation.

The proposed LRT MSF facility will not have any above ground storage tanks (ASTs) which are typically found at Bus MSFs. Since the LRV are electric and do not have combustion engines there is no requirement for the diesel, gasoline, and various vehicle oils and fluids that are needed at Bus MSFs. Therefore there are no storage tank emissions at this proposed facility.

Railroad car wheel re-turning (or “truing”) can be found in every country where trains are used for passengers or freight transportation. The proposed facility will include a dedicated underfloor lathe. Underfloor wheel lathes are machine tools specifically designed for corrective maintenance of railway rolling surfaces and brake discs. These are designed to regenerate the wheel profiles subject to normal wear and deformation caused by the transit of the wheels on the track.

The wheel lathe system produces coarse metal turnings as it shaves incremental layers of rail car wheels to re-align them. These coarse metals turnings drop onto the working floor underneath the lathe and are captured by a vacuum conveyance system and sent to a 55 gallon drum for recycling storage. There can be very small quantities of heat produced from the friction of the lathe cutting surface on the wheel which is vented out through general building roof exhausts. There are no significant fugitive emissions of particulate and metals created by this process. During the Environmental Compliance Approval (ECA) application stage, the MOECC will require the actual production amounts for the truing including the number of wheels are serviced in one hour and the frequency that the 55 gallon drum is sent for recycling.

The undercarriage of the LRVs will also undergo cleaning during maintenance. The undercarriage will be blown with air to clean-off accumulated solids or dirt. Due to the nature and size of the dirt particles, it is not likely that these particles will be released to the atmosphere; therefore this activity is considered an insignificant source.

3. Applicable Guidelines

3.1 Guideline D-6

The D-series of guidelines were developed by the Ontario Ministry of the Environment and Climate Change (MOECC) in 1995 as a means to assess recommended separation distances and other control measures for land use planning proposals in an effort to prevent or minimize ‘adverse effects’ from the encroachment of incompatible land uses where a facility either exists or is proposed. The guideline specifically addresses issues of odour, dust, noise and litter.

Guideline D-6 Compatibility between Industrial Facilities and Sensitive Land Uses, addresses industrial land uses similar to the proposed LRT MSF. From the Guideline’s synopsis, Guideline D-6 is “intended to be applied in the land use planning process to prevent or minimize future land use problems due to the encroachment of sensitive land uses and industrial land uses on one another.” As the proposed project may not require a land use planning assessment (e.g. Official Plan Amendment nor a Zoning By-law Amendment), Guideline D-6 does not strictly apply; regardless, it still can be used to consider what would generally be considered acceptable.

Guideline D-6 defines an Area of Influence and a Recommended Minimum Setback distance for three classes of industrial operation: light, medium, and heavy industrial uses. These distances are determined by industry class and are shown in Table 3-1.

Table 3-1: Guideline D-6 Recommended Minimum Setback Distances for Industrial Land Uses

Industry Classification	Area of Influence	Recommended Setback
Class I – Light Industrial	70 m	20 m
Class II – Medium Industrial	300 m	70 m
Class III – Heavy Industrial	1000 m	300 m

Based on the size of the facility and the nature of the use, the proposed Finch West LRT MSF is consistent with a Class 2 industry, with an Area of Influence of 300 m, and a Recommended Minimum Setback Distance of 70 m.

Guideline D-6 recommends that detailed assessments be conducted where sensitive land uses are located within the Area of Influence of the industrial facility. There are several sensitive receptors within the Area of Influence. The closest sensitive use is a residential dwelling located at the corner of Elana Drive and Finch Avenue West. The detailed analyses presented in the subsequent sections of the report meet this requirement of Guideline D-6.

Guideline D-6 also provides a Recommended Minimum Setback Distance of 70 m for Class 2 facilities. The distances between the residential dwelling and the Finch West LRT MSF are:

- Property line to property line – approximately 33 m
- Residential dwelling façade to closest MSF building façade – approximately 48 m

While the residential dwelling lies within the Recommended Minimum Setback Distance from the proposed Finch West LRT MSF, Guideline D-6 is clear that the Minimum Setback Distance is a recommendation only. Section 4.10 of the Guideline allows for development to occur within the minimum setback for “redevelopment, infilling and mixed use” areas. This project would qualify as redevelopment. In such cases, Section 4.10 of the Guideline requires that a detailed assessment be conducted to show that the relevant air quality guidelines are met. The detailed analyses presented in the subsequent sections demonstrate compliance with all applicable air quality criteria. Thus, the minimum setback requirements of Guideline D-6 have been addressed.

3.2 Ambient Air Quality Criteria

In order to assess the impact of the project, the potential maximum concentrations of the various significant contaminants at sensitive receptors were predicted using detailed dispersion modelling, and compared to published guidelines. Relevant agencies and organizations in Ontario and their applicable contaminant guidelines are:

- Ontario Regulation 419/05, Air Pollution – Local Air Quality
- MOECC Ambient Air Quality Criteria (AAQC)
- Environmental Generator Checklist Supplement to Application for Approval, EPA S. 9, MOECC
- Proposed Canadian Ambient Air Quality standards (CAAQS).

AAQCs are acceptable effects-based levels in ambient air. Limits are set based on the “limiting effect” and are the lowest concentrations at which an adverse effect may be experienced. Effects considered may be health, odour, vegetation, soiling, visibility, corrosion or others and limits have variable averaging times appropriate for the effect that they are intended to protect against. AAQCs are used for assessing general air quality and the potential for causing an adverse effect. They are set at levels below which adverse health and/or environmental effects are not expected. If a contaminant has more than one AAQC, all must be used for assessment purposes as each represents a different type of effect linked to a particular averaging period.

The Canadian Council of Ministers of the Environment (CCME) has developed Canada-wide standards for a variety of contaminants. These standards are developed jointly by various provincial jurisdictions based on a scientific and risk-based approach. Standards are presented to the Ministers along with a timetable for implementation and monitoring and public reporting programs. Ministers are responsible for implementing the standards within their own jurisdictions and promote consistency across the country. Applicable standards include the 2020 proposed Canadian Ambient Air Quality standards for PM2.5 (particles smaller than 2.5 µm in diameter). This standard is based on the 98th percentile ambient measurement (24-hour), annually averaged over three years.

The criteria for each contaminant and its applicable averaging period was used to assess the maximum predicted effect at sensitive receptors. The criteria and averaging periods used in this assessment for the main contaminants of concern are presented in Table 3-2.

Table 3-2: Summary of Applicable Guidelines and Standards

Contaminant	Criteria	Averaging Period (hr)	Air Quality Threshold Value (µg/m^3)
NO_2	AAQC	1	400
	AAQC	24	200
CO	AAQC	1	36,200
	AAQC	8	15,700
$PM_{2.5}$	CAAQS	24	27
	CAAQS	Annual	8.8
TSP	AAQC	24	120
Acetaldehyde	AAQC	24	500
Acrolein	AAQC	1	4.5
	AAQC	24	0.4
Benzene	AAQC	24	2.3
	AAQC	Annual	0.45
1,3-Butadiene	AAQC	24	10
	AAQC	Annual	2
Formaldehyde	AAQC	24	65

Contaminant	Criteria	Averaging Period (hr)	Air Quality Threshold Value (µg/m^3)
2-ethylhexyl acetate	AAQC - JSL	24	15
Butyl acetate	AAQC	1	15,000
	AAQC	10 minute	1,000
n-Pentyl propionate	AAQC - JSL	24	21
Hexavalent Chromium (PM-10 Fraction)	AAQC (proposed)	24	0.00035
	AAQC (proposed)	Annual	0.00007

4. Existing Ambient Air Quality

The baseline ambient air quality was based on publicly available historical data from ambient air quality monitoring stations within Ontario (See Appendix D-1). Data utilized was the latest publicly available at the time of this Air Quality assessment. It was assumed that the historic ambient air quality will be the same for the modelled operations scenario.

Data was extracted from the annual MOE publication “Air Quality in Ontario”. Five years of data from 2008 through 2012 were used (where available).

Ambient monitoring data for air quality pollutants was extracted as follows for (CO, PM2.5, NO2, NOx, formaldehyde, acetaldehyde, benzene, 1,3 butadiene and acrolein):

- 1 hour, 8 hour, and 24 hour ambient concentrations for the contaminants were obtained from the 90th percentile of hourly measurements from the representative AQ monitoring station (the average value was calculated over the available years).
- Annual ambient concentrations for the contaminants were obtained from the mean measurements from the representative AQ monitoring station (the average value was calculated over the available years).

Details of the AQ monitoring stations closest to the study area are provided in Table 4-1.

Table 4-1: GTA AQ Monitoring Stations Information

Station Name:	**Toronto College St**	**Toronto East**	**Toronto West**	**Toronto Downtown**	**Toronto Perth**	**Oshawa**
NAPS Number:	60427	60410	60430	60433	60418	61702
Address:	223 College St, Toronto, Ontario	Kennedy Rd and Lawrence Ave, Toronto, Ontario	125 Resources Rd, Toronto, Ontario	Bay Street and Wellesley St. W, Toronto, Ontario.	Perth/Ruskin (Junction Triangle), Toronto, Ontario	2000 Simcoe Street North, Oshawa, Ontario
Latitude:	43.65	43.74	43.70	43.66	43.66	43.9
Longitude:	-79.39	-79.27	-79.54	-79.38	-79.45	-78.89
Station Type:	Urban	Urban	Urban	Urban	Urban	Urban
Height of Air Intake:	9 m	4 m	8 m	8 m	-	7 m
Elevation ASL:	122 m	172 m	149 m	107 m	-	162 m
Pollutants Measured	Benzene and 1,3-Butadiene	NOx, NO, NO_2, PM2.5 and Ozone	CO	NOx, NO, NO_2, CO, PM2.5 and Ozone	Formaldehyde, Acetaldehyde and Acrolein	NOx, NO, NO_2, PM2.5 and Ozone
Years Available	2008-2012	2008-2012	2008-2012	2008-2012	2002-2006	2008-2012

The background contaminant concentration levels used already include emissions resulting from existing traffic and industrial activities in the areas the air quality monitoring was conducted. The potential for double counting likely results in conservative predicted maximum concentrations for comparison with the air quality standards.

Table 4-2 shows the 90th percentile ambient and mean concentration values from the available years of data. These values will be used for the background concentrations. It should be noted that the background concentration for benzene (annual) exceeds its respective air quality threshold.

Table 4-2: Background Concentrations Used in Air Dispersion Modelling

Contaminant	Averaging Period	Ambient Concentration Measured (µg/m³)	Statistic	Air Quality Threshold (µg/m³)	Percent of Air Quality Threshold (%)
NOx	1	49.5	90th Percentile Concentration	400	12%
	24	49.5	90th Percentile Concentration	200	25%
CO	1	424	90th Percentile Concentration	36,200	1%
	8	424	90th Percentile Concentration	15,700	3%
$PM_{2.5}$	24	13.53	90th Percentile Concentration	27	50%
	Annual	6.07	Mean Concentration	8.8	69%
Acetaldehyde	24	2.96	90th Percentile Concentration	500	1%
Acrolein	1	0.24	90th Percentile Concentration	4.5	5%
Acrolein	24	0.24	90th Percentile Concentration	0.4	60%
Benzene	24	1.06	90th Percentile Concentration	2.3	46%
	Annual	0.70	Mean Concentration	0.45	156%
1,3-Butadiene	24	0.12	90th Percentile Concentration	10	1%
	Annual	0.07	90th Percentile Concentration	2	4%
Formaldehyde	24	5.79	90th Percentile Concentration	65	9%

Note: Total Particulate Matter (TPM) background levels were calculated using MOECC-approved ratios, as provided in Appendix D-1.

5. Assessment Methodology

5.1 General Approach

In order to estimate the worst-case impacts resulting from emissions from the Finch West LRT MSF the following were conducted:

- Emission rates were estimated based on U.S. EPA and MOECC recommended methods and models;
- Air dispersion modelling was conducted using AERMOD, version 14143; and
- Maximum modelled results were combined with maximum background concentrations where available to provide conservative predictions of worst-case impacts at the property boundary and surrounding sensitive receptors.

5.2 Emission Sources

To determine the maximum air emission rates from each of the sources on-site, the following information and assumptions were used. The Source Summary Table provides a summary of all of the sources, list of significant contaminants and the respective emission rate. It can be found in Appendix D-2.

5.2.1 Compressed Air Cleaning and Sand System Ventilation/Dust Collector Systems

Two separate dust collector units were assumed. A vertical exhaust stack with an exhaust flowrate of 1,100 cubic feet/minute (0.5 m^3/s) and a maximum particulate matter outlet loading of 20 mg/m^3 (highly conservative default emission factor, recommended by MOECC in lieu of manufacturer's specifications) were assumed at each dust collector. Stack parameters such as diameter and height above grade were based on a manufacturer specification provided for a similar dust collector with the same exhaust flowrate.

5.2.2 Painting Operations

The maximum paint usage amount (L/hour) and types of paints were assumed from a similar LRV MSF located in Toronto, Ontario. One vertical exhaust for the paint spray booth was modelled with the same stack parameters as the similar MSF.

The maximum weight percentages present in the material safety data sheets (MSDS) for the paints were used to estimate the amounts of each chemical present. Since there are multiple potential paints and related materials, a worst case product approach was taken which uses the maximum weight percentage for each chemical to determine the maximum emission rate. This is a conservative estimation since the combined weight percent of the various compounds are >100%.

For the volatile organic compound (VOC) components in the paint, it was conservatively assumed that 100% of the volatile components of the paint will be emitted to the atmosphere through a designated exhaust stack. For the solid components in the paint, an overspray amount of 30% was assumed, whereby of the total paint sprayed, 70% is expected to adhere to the part and 30% is expected to remain in the air inside the booth. In addition, before the paint emissions are exhausted to atmosphere, they travel through a dry arrestor filter, which has a particulate removal efficiency estimated to be minimum 95% (i.e., only 5% of the particulate components from the overspray are exhausted). These factors were applied to the emission calculations, as per methodology used at the similar MSF facility.

A sample emission rate calculation is provided below.

Particulate Matter
Maximum Paint usage = 2.5 L/hr
Maximum Concentration = 89.75% solids
Density of Paint = 1.85 kg/L (maximum density)
Overspray % = 30%
Filter Efficiency = 95%

= Paint Usage (L/hr) x Max % in Paint x Density (kg/L) x Overspray (%) x Removal Efficiency (100-95)%
= 2.5 L/hr x 89.75% x 1.85 kg/L x 30% x (100-95)% x 1000 g/kg x 1 hr/3600s
= 1.72E-02 g/s

5.2.3 Maintenance Welding

Maintenance welding is expected to occur in the Main Repair Shop and the Maintenance of Way Building. The maintenance welding activities will not have a dedicated exhaust to atmosphere. Emissions will be captured by a portable welding fume extractor(s) and vented internally within the building air. The devices are equipped with a two-pass filter system with a main filter efficiency >99 % followed by a HEPA filter efficiency >99.97 % at 0.3 mm DOP (industry standard rating). For emission estimation purposes, a particulate and metals removal efficiency of 99% was used. All maintenance welding emissions are assumed to exit the building via general exhaust as fugitive emissions and have been conservatively modelled in AERMOD as volume sources.

For both of the buildings in which maintenance welding is expected to occur, the maximum welding rod usage amount (kg/hour) was assumed to be 4 kg/hr (8 kg/hr total). This is considered to be very conservative estimate for maintenance welding consumption. Since the criteria averaging times for all of the compounds (PM and metals) associated with the welding operations are 24 hours or annual, a consideration of the maximum period the welding may occur was also included in the emission estimates. It was conservatively assumed that the maintenance welding will occur in both buildings for a maximum of 4 hours per 8 hour shift (or a maximum of 50% of the 24 hour period). Therefore, a factor of 0.5 was applied to the g/s estimate.

The emissions associated with maintenance welding include particulate matter < 10 microns (PM-10) and various metals. Since the specific potential types of welding material is not known at this stage, and assessment approach was performed using USEPA AP-42 emission factors for Gas Metal Arc Welding (GMAW) – Chapter 12.19 Electric Arc Welding, Table 12.19-1 and Table 12.19-2. Again, since the specific type of welding material is not currently known, the maximum emission factor for each compound within the GMAW category was selected for conservative estimation purposes.

A sample emission rate calculation is provided below.

Chromium (VI)
= Welding Road usage (kg/hr) x US EPA AP-42 EF (GMAW) x Filter Removal Efficiency (%)
= 4 kg/hr x 0.1 (0.01 g/kg) x (100-99)% x 1 hr/3600s
= 1.11E-08 g/s

Applying the 0.5 factor that maintenance welding will only occur for a maximum of 4 hours/shift or 12 hr/24 hr day

= 1.11E-08 g/s x 0.5

= 5.56E-09 g/s at 4 kg/hr usage
= 1.11E-08 g/s at 8 kg/hr usage

Overall, emission estimates and maximum impacts of PM and metals from the maintenance welding activities are considered to be highly conservative using the methods described above.

5.2.4 Comfort Heating

Natural gas-fired comfort heating equipment (HVAC, air make-up units, unit heaters, etc.) are assumed to operate at the three main buildings on-site. Since the equipment inventory is not currently known, the total heat input from the comfort heating equipment present at a similar sized facility was used. Emission estimates for products of combustion are based on emission factors obtained from USEPA AP-42, Section 1.4 - Natural Gas Combustion for uncontrolled units. Since the MOECC standard for nitrogen oxides is the most stringent of all the products of combustion (carbon monoxide, sulphur dioxide, VOC, etc.), it was the only contaminant modelled from this source, as the remainder of the contaminants are considered to be negligible.

5.2.5 Emergency Generators

The emissions from the periodic maintenance testing of the two emergency generators (each rated at 800 kW) were estimated with EPA Tier 4 emission standards for non-road diesel engines. It was assumed that only one generator will be tested at a time with a typical testing time of two hours per month at full operating load. Following the guidance found in the MOECC Guideline “Procedure for Preparing an Emission Summary and Dispersion Modelling Report, Version 3.0”,, only nitrogen oxides were assumed to be emitted in a significant amount, however particulate matter was also included. All other products of combustion (carbon monoxide, sulphur dioxide, VOC, etc.), were considered negligible. Therefore, nitrogen oxides and particulate matter were modelled from these sources.

5.2.6 Parking Lot Emissions

Parking lot emissions were modelled through emission factors generated using US EPA MOVES2014. MOVES2014 (Motor Vehicle Emissions Simulator) is the U.S EPA latest program for estimating vehicle emissions due to tailpipe emissions, fuel evaporation, and brake and tire wear. The parking lot will be paved so particulate matter emissions due to road dust are expected to be negligible.

This model was used to generate composite emission factors (i.e., grams of pollutant emitted per second) for NO_2, CO, PM2.5, and HC’s. MOVES2014 generates emissions factors based on vehicle type, vehicle mix, road type, traffic volume, vehicle age and vehicle speed. Details on the parking lot size, area, and number parking spots were provided by the layout of the Preferred Design Concept.

The following assumptions were made to estimate emission from vehicles using the parking lots:

- Vehicle emissions due to vehicles travelling within the parking lots were estimated based on average vehicle travel speed of 20 km/hr.
- It was conservatively assumed that the number of vehicles travelling in the parking lot is twice the number of parking spots (199 parking spots x 2 = 398 vehicles).
- Travel distance was approximated from parking access point to the end of parking area.
- Number of vehicles idling was based on twice the number of parking spots (398 vehicles).
- Assumed 90 seconds of idling per vehicle.

- For start-up emissions, it was assumed the number of vehicles starting will be the same as number of parking spots.
- It was assumed 100% of the vehicles have a soak time between 6-12 hours because typical shift is 8.5 hours based on the departure and arrival times provided.

The summary of the results and the input/output files for the MOVES2014 modelling are provided in Appendix D-3.

5.3 Assessment of Negligibility

Many of the contaminants at the facility are emitted in small amounts. As such, a screening-out assessment of contaminants that are emitted in negligible amounts was conducted in accordance with MOECC Guideline "Procedure for Preparing an Emission Summary and Dispersion Modelling Report, Version 3.0".

Emission rates for each contaminant were assessed against the emission threshold, using the urban screening dispersion factors found in Table B.1 of the ESDM Guideline. Two different dispersion factors where used since the two buildings are a different distances to the facility property boundary as shown in Table 5-1. Where the buildings shared common contaminants, the greater of the two factors was applied.

Table 5-1: Urban Screening Dispersion Factors for Negligibility Assessment

Building	Distance to Source	Urban Dispersion Factor (µg/m^3 per g/s emission)
Maintenance Repair Shop	100 m	2600
Maintenance of Way	20 m	8700

If the emission rate was less than the emission threshold, the contaminant was determined negligible and not assessed further. Contaminants that were not found to be negligible were modelled in AERMOD and assessed against their applicable guidelines for the applicable averaging periods. Contaminants that do not have a guideline were modelled in AERMOD and results have been presented. Sample calculations for the assessment of negligibility are shown in Appendix D-4.

During the ECA application submission stage, if the emission rate for one or more contaminants is greater than the emission threshold and it is based on a Jurisdictional Screening Level (JSL) value, then the contaminant(s) must be assessed using the dispersion modelling to determine the maximum point of impingement value and a maximum ground level concentration submission should be sent to the MOECC Standards Development Branch.

6. Air Dispersion Modelling

6.1 Discussion of Setup and Inputs

Air dispersion models are used to predict how a contaminant concentration is diluted as it moves through the atmosphere. The contaminant concentration at a specific receptor location is a function of a variety of parameters including meteorological conditions in the vicinity of the source and the receptor, contaminant emission rate(s) and physical characteristics of the source and terrain in the vicinity of the both the source and receptor. Air dispersion models use a combination of data inputs (i.e. contaminant emission rate, exhaust velocity, temperature, height above grade, etc.) for emission sources in conjunction with mathematical algorithms that describe both the temporal and spatial variation of contaminants as they move away from the source.

For the MSF assessment, a MOECC approved advanced dispersion model known as AERMOD was used to predict the potential maximum emissions. While the facility is not included in the O.Reg 419/05 list of Schedule 4 or 5 facilities, since it is being constructed post-2005, it must be assessed with AERMOD. The averaging periods for the significant compounds modelled in AERMOD include the standard 1-hour and 24-hour periods, as well as 10-minute and annual for select compounds. The air dispersion modelling was conducted following the MOE guidance document, entitled *Air Dispersion Modelling Guideline for Ontario, version 2.0*" (March 2009) (ADMGO).

The MOECC has recently announced they will be posting an Information Notice on the Environmental Registry to replace the current regulatory air dispersion models under Reg. 419/05. The notice will be posted in October 2015 and will require the use of the following updated model versions:

- AERMOD dispersion model – update to AERMOD version 14134 (version date May 14, 2014)
- AERMET meteorological pre-processor – update to AERMET version 14134 (version date May 14, 2014)

As such, the modeling has been completed using the most recent versions of AERMOD and AERMET (version 14143) in advance of this Notice.

The model was set-up to include the three main on-site buildings, the exhaust stacks and the property line. Source data inputs were established to assume the maximum emissions scenario. The exhaust stack locations of the dust collectors were located closest to the property line. In addition, the emergency generators location was assumed to be outdoors with a lower stack height, approximately equal to the height of each enclosure. The locations of the comfort heating equipment were not known at this level of design, therefore each building was modelled as a volume source. Modelling the comfort heating equipment is a conservative approach as it can be used to represent multiple sources and can result in elevated off-site ground level concentrations. Additionally, fugitive emissions from the maintenance welding activities were modelled as volume sources.

To determine the maximum ground level concentration of each contaminant, a receptor grid was set up as per the ADMGO, whereby receptors are spaced every 20 m within 200 m of the property boundary; every 50 m within 500 m; every 100 m beyond to a distance of 1000 m from the MSF property boundary. Receptors were also placed along the MSF property boundary (property line) every 10 m. Five years of regional meteorological data (version 14143) and local terrain data was utilized within the model to simulate actual conditions and determine the air quality impact from the MSF.

A copy of the AERMOD input, output, terrain and MET data files for each of the modelled contaminants are provided in Appendix D-5.

6.2 Sensitive Receptors

A total of 13 sensitive receptors were modelled to determine the air quality impact expected at residences, commercial and institutional buildings that house vulnerable populations. A receptor height of 1.5 metres was chosen for the typical breathing height for all receptors. Multiple receptor heights were chosen for multi-storey buildings with potential for operable windows and roof height for air intake locations. For larger receptor buildings, receptors: R8, R12, R13, the discrete receptor was placed on the façade of the building closest to the MSF property boundary.

The modelled receptors are listed in **Table 6-1** below:

Table 6-1: Air Quality Receptor Locations

Receptor ID#	Receptor Description
R1	Yorkview Lifecare Centre – 2045 Finch Avenue West (multiple heights)
R2	Monsignor Fraser College -Norfinch Campus – 45 Norfinch Drive (multiple heights)
R3	Best Western Hotel – 50 Norfinch Drive (multiple heights)
R4	Norfinch Medical Centre – 2100 Finch Avenue West (multiple heights)
R5	Residence - 58 Blaney Court
R6	Residence - 84 Picaro Rd
R7	Residence - 72 Elana Drive
R8	Yorkgate Mall – 1 York Gate Blvd (multiple heights)
R9	Residence - 16 Wheatsheaf Crescent
R10	Residence - 38 Wheatsheaf Crescent
R11	Residence - 56 Wheatsheaf Crescent
R12	Humber River Hospital – 2111 Finch Avenue West (multiple heights)
R13	Apartment Building – York Gate Blvd (multiple heights)

The receptor locations are presented in Figure 2.

Figure 2: Air Quality Receptor Locations

6.3 Discussion of Results

The AERMOD results were generated using the maximum emissions scenario whereby all of the on-site sources released the maximum amount of air contaminant(s) at the maximum exhaust flowrate continuously for 24 hours per day, 7 days per week, 365 days per year. The AERMOD model then used the meteorological data to simulate the dispersion of the emissions, considering the effects of the buildings on-site and the surrounding land topography to simulate receptor elevations, relative to the site. The selection of contaminants was based on other facilities which have similar on-site activities and the expected contaminants.

Information from nearby monitoring stations including the 90th percentile ambient concentration levels over a five year period were added to the AERMOD results to determine the impact at the property line, grid receptors and at each of the identified receptor locations.

The results are shown in **Table 6-2** and compared to the current and proposed MOECC Standards and/or Guidelines, which include:

- *Ontario Regulation 419/05*, Air Pollution – Local Air Quality
- MOECC Ambient Air Quality Criteria (AAQC)
- Proposed Canadian Ambient Air Quality standards (CAAQS).
- Environmental Generator Checklist Supplement to Application for Approval, EPA S. 9, MOE

Table 6-2: Air Quality Modelling Results

Contaminant	Total Facility Emission Rate (g/s)	Averaging Time (hr)	Background Concentration (ug/m^3)	Maximum Ground Level Concentration (ug/m^3)	Combined [3] Maximum Concentration (ug/m^3)	MOE Standards and/or Guidelines (ug/m^3)	Percentage (%) of Standard or Guideline		
							Combined	Sources Only	Background Only
Nitrogen Oxides	2.78E-01 [1]	0.5	59.9 [2]	110.08 [2]	170	1880	9.0%	5.9%	3.2%
	1.30E-01	1	49.5	16.17	66	400	16.4%	4.0%	12.4%
	1.30E-01	24	49.5	12.08	62	200	30.8%	6.0%	24.8%
Particulate Matter <2.5 microns (PM2.5)	2.25E-02	24	13.5	3.77	17.3	27	64.1%	14.0%	50.1%
		Annual	6.1	0.64	6.7	8.8	76.2%	7.3%	69.0%
Total Particulate Matter (TPM)	6.05E-02	24	45.1	11.98	57.1	120	47.6%	10.0%	37.6%
2-ethyl acetate	2.64E-02	24	-[4]	1.60	1.60	15	10.7%	10.7%	-[4]
Butyl Acetate	2.08E-01	1	-[4]	35.93	35.9	15000	0.2%	0.2%	-[4]
		10 minute	-[4]	59.28	59.3	1000	5.9%	5.9%	-[4]
Ketone	2.64E-02	24	-[4]	1.60	1.60	NA [5]	-	-	-[4]
n-Pentyl propionate	6.94E-02	24	-[4]	4.21	4.2	21	20.0%	20.0%	-[4]
2,4-pentanedione	6.94E-01	24	-[4]	42.06	42.1	NA [5]	-	-	-[4]
Carbon monoxide	1.66E-03	1	424	6.00	430.0	36,200	1.2%	0.02%	1.2%
		8	424	3.35	427.4	15,700	2.7%	0.02%	2.7%
Formaldehyde	2.01E-06	24	5.79	2.39E-03	5.79	65	8.9%	0.004%	8.9%
Chromium (VI) (PM-10 Fraction)	1.11E-07[6]	24	-[4]	3.00E-05[6]	3.00E-05	3.50E-04	8.6%	8.6%	-[4]
		Annual	-[4]	1.00E-05[6]	1.00E-05	7.00E-05	14.3%	14.3%	-[4]
Acetaldehyde	3.71E-06	24	2.96	4.41E-03	2.96	500	0.6%	0.001%	0.6%
		0.5	2.96	1.30E-02	2.97	500	0.6%	0.003%	0.6%
Acrolein	2.22E-07	1	0.24	8.02E-04	0.24	4.5	5.4%	0.018%	5.3%
		24	0.24	2.64E-04	0.24	0.4	60.1%	0.066%	60.0%
Benzene	7.53E-06	24	1.06	8.95E-03	1.07	2.3	46.5%	0.389%	46.1%
		Annual	0.70	1.84E-03	0.70	0.45	156.0%	0.409%	155.6%
1,3-Butadiene	1.63E-06	24	0.12	1.94E-03	0.12	10	1.2%	0.019%	1.2%
		Annual	0.07	3.98E-04	0.07	2	3.5%	0.020%	3.5%

Notes:
1. *Total facility emission rate including testing of one (1) emergency generator.*
2. *1-hr AERMOD output and background concentration was multiplied by 1.21 to estimate half-hour concentration as per ESDM procedure document, March 2009.*
3. *Combined maximum concentrations are the sum of the maximum modelled POI results (values have been screened for MET anomalies) and background concentration. All receptors included (i.e. at property line or beyond property line within modelled area).*
4. *No background data available.*
5. *No POI standard or guideline available. MOECC, Standards Development Branch would conduct Maximum Ground Level Concentration Assessment to determine acceptable POI concentration when applying for an Environmental Compliance Approval*
6. *Maximum Ground Level Concentration for Chromium VI reflects total facility emission rate of 1.11E-07 g/s; however, actual emission rate as per Section 5.2.3 is 1.11E-08 g/s at 8 kg/hr usage.*

The results from the maximum emissions scenario for the preferred design show that no contaminants were modelled to exceed MOECC Standards and/or Guidelines with the exception of benzene on an annual basis. It should be noted that the measured background concentration of benzene is 155.6 % of the annual limit and the facility's contribution is approximately 0.4%.

6.4 Mitigation Measures

To comply with the applicable regulations and standards during construction, a Dust Management Plan will be implemented by the successful bidder and will adhere to applicable standards and legislation. It will include the following measures at a minimum:

- Dust suppression (water), watering of stockpiles, covering all trucks hauling excess material, construction of wind barrier to limit dust to construction site, road sweeping, speed limits, and cleaning of vehicle tires before leaving the construction site to control track-out;
- Site inspections of dust generation carried out as part of the program to ensure mitigation is effective at the source; and
- Operational protocols to minimize material handling activities during high wind conditions and limit impacts from diesel/gas powered construction equipment implemented during construction that will include using electric-powered equipment where applicable, minimizing idling time for all diesel/gas powered construction equipment, utilizing diesel powered construction equipment with stringent emissions standards and ensuring construction equipment is well maintained.

Other mitigation measures are detailed in *"Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities (March 2005)"* prepared by Cheminfo for Environment Canada. It is provided in Appendix D-6 for reference.

During operation of the facility, particulate matter generated from the compressed air cleaning and sand dispensing system will be controlled with a ventilation/dust collection system. Painting will be conducted inside the paint spray booth equipped with an exhaust system and overspray filters which will control particulate matter emissions. Maintenance welding will be performed with mobile fume extraction units equipped with high efficiency filtration and exhaust inside the building.

The following mitigation measures will be incorporated into the design and operation of the facility in order to reduce resultant air emissions:

- All on-site roadways and parking lots should be paved to minimize the generation of road dust;
- Emergency generators with more stringent air emission levels will be selected for procurement (i.e., generators conforming with EPA Tier IV emission standards or higher) which are required for compliance at the off-site receptors;
- During operation, the emergency generators will be tested only one at a time;

- Stack location for the paint booth exhaust will be at least 100 metres from the nearest property line;
- Paint Arrestor Pads will be installed in the paint booth and have a minimum of 95% particulate removal efficiency;
- Stack locations for other process exhausts will be situated as far away from the property line as feasible;
- Stack parameters (height, location, configuration, etc.) will be designed to ensure good dispersion (no rain caps), avoid re-entrainment of contaminant air into building and compliance with MOECC limits
- Selection of welding material that is chromium-free or the material will contain the least amount of chromium compounds as possible for welding to ensure minimal hexavalent chromium emissions are generated during welding process;
- Maintenance welding must be carried out with mobile fume extraction units equipped with high efficiency filtration with a minimal removal efficiency of 99% for particulate matter and metal fumes before exhausting inside the building; and,
- Maintenance welding will only be performed for a maximum of 12 hours per day.

An Application for Environmental Compliance Approval (Air) (ECA) must be prepared for the MSF in accordance with Section 9 of the *Environmental Protection Act* during detail design.

The significance of source of emissions will be evaluated at the ECA stage by Project Co and necessary controls provided to address the prevention of fugitive dust and metal emissions in accordance with applicable standards and regulations. Controls will be applied, including potential fugitive dust controls, to ensure all compounds of concern meet applicable O.Reg. 419/05 criteria.

6.5 Monitoring

During construction, fence line air concentrations of dust (particulate) and other compounds identified as being released during construction will be monitored. A dust management plan will be developed and implemented in order to address protocols and procedures to be followed to reduce the creation of dust and other compounds.

The ECA will include a condition to record and document environmental complaints. As part of the reporting, a root case analysis and follow up measures will be required.

7. References

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Appendix D-1

GTA AQ Monitoring Stations - Background Air Quality Levels

Pollutant	Averaging Period	2008*	2009*	2010*	2011*	2012*	Average (Five Years)	Background++ (ug/m^3)
CO (ppm)	1-Hour	0.29	0.33	0.37	0.33	0.38	0.34	424
	8-Hour	0.29	0.33	0.37	0.33	0.38	0.34	424
PM2.5	24-hour	15.0	11.67	14.33	13.33	13.33	13.53	13.53
	Annual Mean	6.53	5.57	4.73	5.97	6.07	6.07	6.07
PM10	24-hour	27.78	21.6	26.54	24.64	24.69	25.06	25.06
NOx(ppb)	1-hour	37.67	35.33	33.00	32.67	29.33	33.60	69.1
	24-hour	37.67	35.33	33.00	32.67	29.33	33.60	69.1
NO_2	1-hour	26.33	24.67	24.00	24.00	21.33	24.07	49.5
	24-hour	26.33	24.67	24.00	24.00	21.33	24.07	49.5

*Ministry of the Environment, “Air Quality in Ontario, Reports for 2008, 2009, 2010, 2011 and 2012”.
90th percentile of hourly values used for short term concentrations and mean for annual concentrations.
**PM10 estimated using MOE approved ratios ($PM_{2.5}$ / PM_{10} = 0.54 and $PM_{2.5}$ / TSP = 0.3).
++Background based on average from five years (2008-2012) at representative stations (Toronto Downton, Toronto East and Oshawa) and converted to ug/m^3 at 283 K.

GTA AQ Monitoring Stations – Background Air Quality Levels

Pollutant	Averaging Period	2008*	2009*	2010*	2011*	2012*	Average (Five Years)	Background+ (ug/m3)
Benzene	24-Hour	1.06	1.21	1.16	0.90	0.98	1.06	1.06
	Annual Mean	0.77	0.77	0.77	0.59	0.62	0.70	0.70
1,3-Butadiene	24-Hour	0.14	0.13	0.12	0.10	0.11	0.12	0.12
	Annual Mean	0.08	0.08	0.07	0.06	0.06	0.072	0.072
Pollutant	Averaging Period	2002 **	2003 **	2004 **	2005 **	2006 **	Average (Five Years)	Background^{++} (ug/m^3)
Formaldehyde	1-Hour	5.60	4.46	7.97	5.01	3.69	5.79	5.79
	24-Hour	5.60	4.46	7.97	5.01	3.69	5.79	5.79
Acrolein	1-Hour	0.20	0.23	0.14	0.57	0.04	0.24	0.24
	24-Hour	0.20	0.23	0.14	0.57	0.04	0.24	0.24
Acetaldehyde	1-Hour	2.36	3.13	3.20	3.98	2.15	2.96	2.96
	24-Hour	2.36	3.13	3.20	3.98	2.15	2.96	2.96

*Data from Toronto NAPS station (60427). 90th percentile of hourly values used for short term concentrations and mean for annual concentrations.

** Data from Toronto NAPS station (60418). 90th percentile of hourly values used for short term concentrations.

+Background based on average from five years (2008-2012) at Toronto NAPS station (60427).

++Background based on average from five years (2002-2006) at Toronto NAPS station (60418).

Appendix D-2

Source Summary Table

	Source Description			Source Data								Emission Data					
Source ID	**Source**	**Building**	**Area**	**Exhaust Type**	**Stack Gas Flow Rate (m^3/s)**	**Stack Gas Exit Velocity (m/s)**	**Stack Gas Temp. (°C)**	**Stack Gas Temp. (°K)**	**Stack Diameter (m)**	**Stack Height Above Grade (m)**	**Stack Height Above Roof (m)**	**Contaminant**	**CAS No.**	**Maximum 1-Hour Emission Rate (g/s)**	**Estimation Technique**	**Data Quality**	**Percentage of Overall Emission (1-hr) (%)**
PB-1	Paint Booth exhaust	Maintenance and Repair Shop	Paint Booth	Vertical	14.0	12.0	Ambient	Ambient	1.2	15.0	3.0	2-ethylhexyl acetate	103-09-3	2.64E-02	Mass Balance, Eng. Calc	A.A.	100%
												n-Butyl acetate	123-86-4	2.08E-01	Mass Balance, Eng. Calc	A.A.	100%
												Methyl acetate	79-20-9	2.32E-02	Mass Balance, Eng. Calc	A.A.	100%
												Methyl amyl ketone	110-43-0	2.78E-01	Mass Balance, Eng. Calc	A.A.	100%
												Methyl isoamyl ketone	110-12-3	6.94E-02	Mass Balance, Eng. Calc	A.A.	100%
												n-Pentyl propionate	624-54-4	6.94E-02	Mass Balance, Eng. Calc	A.A.	100%
												Methyl alcohol	67-56-1	6.94E-04	Mass Balance, Eng. Calc	A.A.	100%
												2,4-pentanedione	123-54-6	6.94E-01	Mass Balance, Eng. Calc	A.A.	100%
												dibuytl tin dilaurate	77-58-7	1.04E-02	Mass Balance, Eng. Calc	A.A.	100%
												2-methylbutyl acetate	624-41-9	1.38E-03	Mass Balance, Eng. Calc	A.A.	100%
												Acetone	67-64-1	1.04E-01	Mass Balance, Eng. Calc	A.A.	100%
												Aluminum Hydroxide	21645-51-2	3.75E-02	Mass Balance, Eng. Calc	A.A.	100%
												Bis Sebacate	41556-26-7	5.60E-03	Mass Balance, Eng. Calc	A.A.	100%
												Carbon Black	1333-86-4	2.11E-04	Mass Balance, Eng. Calc	A.A.	100%
												Ethyl 3-ethoxypropionate	763-69-9	2.43E-03	Mass Balance, Eng. Calc	A.A.	100%
												Ethyl Acetate	141-78-6	7.94E-02	Mass Balance, Eng. Calc	A.A.	100%
												Ethylbenzene	100-41-4	1.87E-04	Mass Balance, Eng. Calc	A.A.	100%
												Heptane	142-82-5	5.43E-03	Mass Balance, Eng. Calc	A.A.	100%
												Iron Hydroxide	20344-49-4	1.25E-04	Mass Balance, Eng. Calc	A.A.	100%
												Isopropyl Alcohol	67-63-0	2.88E-02	Mass Balance, Eng. Calc	A.A.	100%
												Ketone Solvent	71808-49-6	2.64E-02	Mass Balance, Eng. Calc	A.A.	100%
												Methyl Ethyl Ketone	78-93-3	1.21E-02	Mass Balance, Eng. Calc	A.A.	100%
												Methyl Sebacate	82919-37-7	1.87E-03	Mass Balance, Eng. Calc	A.A.	100%
												Poly…4-hyroxy phenyl	104810-48-2	5.60E-03	Mass Balance, Eng. Calc	A.A.	100%
												Polyethylene Glycol	25322-68-3	9.34E-04	Mass Balance, Eng. Calc	A.A.	100%
												Primary Amyl Acetate	628-63-7	1.83E-02	Mass Balance, Eng. Calc	A.A.	100%
												t-Butyl Acetate	540-88-5	2.92E-03	Mass Balance, Eng. Calc	A.A.	100%
												Triethylenediamine	280-57-9	9.34E-04	Mass Balance, Eng. Calc	A.A.	100%
												Xylene	1330-20-7	2.70E-03	Mass Balance, Eng. Calc	A.A.	100%
												Particulate Matter	-	1.72E-02	Mass Balance, Eng. Calc	A.A.	45%

	Source Description			Source Data								Emission Data					
Source ID	**Source**	**Building**	**Area**	**Exhaust Type**	**Stack Gas Flow Rate (m^3/s)**	**Stack Gas Exit Velocity (m/s)**	**Stack Gas Temp. (°C)**	**Stack Gas Temp. (°K)**	**Stack Diameter (m)**	**Stack Height Above Grade (m)**	**Stack Height Above Roof (m)**	**Contaminant**	**CAS No.**	**Maximum 1-Hour Emission Rate (g/s)**	**Estimation Technique**	**Data Quality**	**Percentage of Overall Emission (1-hr) (%)**
DC-1	Dust Collector serving Sand Silo	Maintenance Repair Shop	Exterior, near property line	Vertical	0.52	2.1	Ambient	Ambient	0.56	3.8	-	Particulate Matter	-	1.04E-02	MOE guideline	AA	27%
DC-2	Dust Collector serving Blow-down	Maintenance Repair Shop	Exterior, near property line	Vertical	0.52	2.12	Ambient	Ambient	0.56	3.8	-	Particulate Matter	-	1.04E-02	MOE guideline	AA	27%
MSR-1	General Ventilation exhausts - fugitive emissions	Maintenance Repair Shop		Volume (general ventilation)			Ambient	Ambient		12.0		Chromium	7440-47-3	2.93E-06	US EPA AP-42 EF, Manu. Specs	M	50%
												Chromium (VI)	NA-CrVI	5.56E-08	US EPA AP-42 EF, Manu. Specs	M	50%
												Cobalt	7440-48-4	5.56E-09	US EPA AP-42 EF, Manu. Specs	AA	50%
												Manganese	13463-67-7	1.92E-06	US EPA AP-42 EF, Manu. Specs	A	50%
												Nickel	7440-02-0	6.94E-06	US EPA AP-42 EF, Manu. Specs	A	50%
												Particulate Matter (PM-2.5)	--	1.34E-04	US EPA AP-42 EF, Manu. Specs	M	0.3%
MoW-1	General Ventilation exhausts - fugitive emissions	MoW Building		Volume (general ventilation)			Ambient	Ambient		8.0		Chromium	7440-47-3	2.93E-06	US EPA AP-42 EF, Manu. Specs	M	50%
												Chromium (VI)	NA-CrVI	5.56E-08	US EPA AP-42 EF, Manu. Specs	M	50%
												Cobalt	7440-48-4	5.56E-09	US EPA AP-42 EF, Manu. Specs	AA	50%
												Manganese	13463-67-7	1.92E-06	US EPA AP-42 EF, Manu. Specs	A	50%
												Nickel	7440-02-0	6.94E-06	US EPA AP-42 EF, Manu. Specs	A	50%
												Particulate Matter (PM-2.5)	--	1.34E-04	US EPA AP-42 EF, Manu. Specs	M	0.3%
Emergency Equipment																	
GEN-1	Emergency Standby Generator 1	Outdoor Unit	Exterior, near property line	Vertical	2.9	57.2	580	853	0.25	2.4	1.0	Nitrogen Oxides	10102-44-0	1.49E-01	Tier 4 Emission Stds	AA	35%
												Particulate Matter (PM-2.5)	--	2.22E-02	Tier 4 Emission Stds	AA	50%
GEN-2	Emergency Standby Generator 2	Outdoor Unit	Exterior, near property line	Vertical	2.9	57.2	580	853	0.25	2.4	1.0	Nitrogen Oxides	10102-44-0	1.49E-01	Tier 4 Emission Stds	AA	35%
												Particulate Matter (PM-2.5)	--	2.22E-02	Tier 4 Emission Stds	AA	50%
Comfort Heating																	
MSR-1	Comfort heating	Maintenance and Repair Shop	Roof top & interior units, assume volume source	Volume Source			Ambient	Ambient		12.0		Nitrogen Oxides	10102-44-0	1.05E-01	US EPA AP-42 EF, "B"	AA	25%
MoW-1	Comfort heating	Maintenance of Way Building	Roof top & interior units, assume volume source	Volume Source			Ambient	Ambient		8.0		Nitrogen Oxides	10102-44-0	1.03E-02	US EPA AP-42 EF, "B"	AA	2%
OPSCO-1	Comfort heating	OpsCo Building	Roof top & interior units, assume volume source	Volume Source			Ambient	Ambient		9.0		Nitrogen Oxides	10102-44-0	1.39E-02	US EPA AP-42 EF, "B"	AA	3%

	Source Description			Source Data								Emission Data					
Source ID	**Source**	**Building**	**Area**	**Exhaust Type**	**Stack Gas Flow Rate (m^3/s)**	**Stack Gas Exit Velocity (m/s)**	**Stack Gas Temp. (°C)**	**Stack Gas Temp. (°K)**	**Stack Diameter (m)**	**Stack Height Above Grade (m)**	**Stack Height Above Roof (m)**	**Contaminant**	**CAS No.**	**Maximum 1-Hour Emission Rate (g/s)**	**Estimation Technique**	**Data Quality**	**Percentage of Overall Emission (1-hr) (%)**
Parking Lot																	
PAREA-1	Automobiles	Parking Lot	Parking Lot	Area Source			Ambient	Ambient		0.0		Nitrogen Oxides	10102-44-0	6.43E-05	US EPA MOVES2014	AA	0.02%
												Carbon Monoxide	630-08-0	1.66E-03	US EPA MOVES2014	AA	100%
												Particulate Matter (PM-2.5)	--	6.52E-06	US EPA MOVES2014	AA	0.01%
												Acetaldehyde	75-07-0	3.71E-06	US EPA MOVES2014	AA	100%
												Acrolein	107-02-8	2.22E-07	US EPA MOVES2014	AA	100%
												Benzene	71-43-2	7.53E-06	US EPA MOVES2014	AA	100%
												1,3-Butadiene	106-99-0	1.63E-06	US EPA MOVES2014	AA	100%
												Formaldehyde	50-00-0	2.01E-06	US EPA MOVES2014	AA	100%

Notes

" - " - Not available

Estimation Technique:

EF - Emission Factor
EC - Engineering Calculation
MB - Mass Balance
PV-ST - Partially Validated Stack Testing

Data Quality

AA - Above Average
A - Average
M - Marginal

Appendix D-3

MOVES 2014 - Summary of Contaminant Emission Rates
Employee Parking Lot - Finch West MSF

Pollutant	Description	Total Emissions (g/hour)	Total Emissions (g/s) (1-hour average)	Total Emissions (g/s) (24-hour average)
1,3-Butadiene	Total Emissions from Finch MSF Parking Lot	5.87E-03	1.63E-06	6.70E-07
Acetaldehyde	Total Emissions from Finch MSF Parking Lot	1.33E-02	3.71E-06	1.52E-06
Acrolein	Total Emissions from Finch MSF Parking Lot	7.98E-04	2.22E-07	9.10E-08
Benzene	Total Emissions from Finch MSF Parking Lot	2.71E-02	7.53E-06	3.09E-06
Carbon Monoxide (CO)	Total Emissions from Finch MSF Parking Lot	5.99E+00	1.66E-03	6.84E-04
Formaldehyde	Total Emissions from Finch MSF Parking Lot	7.24E-03	2.01E-06	8.26E-07
Nitrogen Dioxide (NO2)	Total Emissions from Finch MSF Parking Lot	1.16E-02	3.22E-06	1.32E-06
Oxides of Nitrogen (NOx)	Total Emissions from Finch MSF Parking Lot	2.32E-01	6.43E-05	2.64E-05
PM10 - Total	Total Emissions from Finch MSF Parking Lot	3.76E-02	1.04E-05	4.28E-06
PM2.5 - Total	Total Emissions from Finch MSF Parking Lot	2.35E-02	6.52E-06	2.68E-06
TSP - Total	Total Emissions from Finch MSF Parking Lot	3.76E-02	1.04E-05	4.28E-06

Vehicles Idling Time	90	seconds/hr
Parking Lot Distance=	0.1488	miles

Appendix D-4

Contaminant Screening Assessment with Emission Threshold

As per Appendix B.1 of the MOE Guidance document "Procedure for Preparing an ESDM Report, Version 3.0" dated March 2009

Contaminant	CAS #	MOECC POI Limit/AAQC/JSL value (ug/m3)	MOECC Publication Source	Averaging Period	Facility Emission Rate (g/s)	Shortest Distance from Source to Property Line (m)	Urban Dispersion Factor - 1 hr basis (ug/m3 per g/s)	1-hr to new hr basis - conversion factor	Site Specific Emission Threshold (g/s) Note 1	% of Site Specific Emission Threshold (Facility Rate (g/s)/ Emission Threshold (g/s))	Significant?
2-ethylhexyl acetate	103-09-3	15.00	JSL	24 hour	2.64E-02	100	2600	0.41	0.0070	>100%	Yes
Acetone	67-64-1	11880	Schedule 3	24 hour	1.04E-01	100	2600	0.41	5.5625	2%	-
Butyl acetate	123-86-4	15000.00	AAQC	1 hour	2.08E-01	100	2600	1.00	2.8846	7%	-
Butyl acetate	123-86-4	1000.00	AAQC	10 min	2.08E-01	100	2600	1.65	0.1165	>100%	Yes
Ethyl acetate	141-78-6	19000	AAQC	1 hour	7.94E-02	100	2600	1.00	3.6538	2%	-
Isopropyl alcohol	67-63-0	7300	Schedule 3	24 hour	2.88E-02	100	2600	0.41	3.4181	1%	-
Ketone Solvent	71808-49-6	0.10	Default for Screening	24 hour	2.64E-02	100	2600	0.41	0.00005	>100%	Yes
Methyl acetate	79-20-9	2400	JSL	24 hour	2.32E-02	100	2600	0.41	1.1237	2%	-
Methyl amyl ketone	110-43-0	4600	AAQC	24 hour	2.78E-01	100	2600	0.41	2.1538	13%	-
Methyl isoamyl ketone	110-12-3	630.00	AAQC	10 min	6.94E-02	100	2600	1.65	0.0734	95%	-
n-Pentyl propionate	624-54-4	21.00	JSL	24 hour	6.94E-02	100	2600	0.41	0.0098	>100%	Yes
Primary amyl acetate	628-63-7	53200	AAQC	24 hour	1.83E-02	100	2600	0.41	24.9096	0%	-
Xylene	1330-20-7	730	Schedule 3	24 hour	2.70E-03	100	2600	0.41	0.3418	1%	-
Methyl alcohol	67-56-1	4000	Schedule 3	24 hour	6.94E-04	100	2600	0.41	1.8729	0%	-
2,4-pentanedione	123-54-6	0.10	Default for Screening	24 hour	6.94E-01	100	2600	0.41	0.00005	>100%	Yes
dibuytl tin dilaurate	77-58-7	30	AAQC	24 hour	1.04E-02	100	2600	0.41	0.0140	74%	-
Acrylic Resin	NA-ACR	120	PM Sch. 3 limit	24 hour	4.17E-03	100	2600	0.41	0.0562	7%	-
Acylic Polymer	NA-ACP	120	PM Sch. 3 limit	24 hour	4.17E-03	100	2600	0.41	0.0562	7%	-
Aluminum hydroxide	21645-51-2	120	PM Sch. 3 limit	24 hour	3.75E-02	100	2600	0.41	0.0562	67%	-
Amorphous silica	7631-86-9	3	JSL	24 hour	4.62E-04	100	2600	0.41	0.0014	33%	-
Amorphous silica-silica base	63231-67-4	3	JSL	24 hour	4.74E-04	100	2600	0.41	0.0014	34%	-
C.I. Pigment Yellow 154	68134-22-5	120	PM Sch. 3 limit	24 hour	3.51E-04	100	2600	0.41	0.0562	1%	-
Calcium Carbonate	1317-65-3	24	JSL	24 hour	4.74E-04	100	2600	0.41	0.0112	4%	-
Carbon Black	1333-86-4	10.00	Schedule 3	24 hour	2.11E-04	100	2600	0.41	0.0047	5%	-
Iron oxide	1309-37-1	25	Schedule 3	24 hour	1.54E-04	100	2600	0.41	0.0117	1%	-
Isoindolinone pigment	36888-99-0	120	PM Sch. 3 limit	24 hour	5.53E-04	100	2600	0.41	0.0562	1%	-
Phthalocyanine green	1328-53-6	120	PM Sch. 3 limit	24 hour	9.94E-05	100	2600	0.41	0.0562	0%	-
Polyester resin	69153-52-2	120	PM Sch. 3 limit	24 hour	2.92E-03	100	2600	0.41	0.0562	5%	-
Polyester resin-B	1239922-22-1	120	PM Sch. 3 limit	24 hour	7.29E-04	100	2600	0.41	0.0562	1%	-
Quinacridone pigment	1047-16-1	120	PM Sch. 3 limit	24 hour	1.54E-03	100	2600	0.41	0.0562	3%	-
Synthetic resin	27925-07-1	120	PM Sch. 3 limit	24 hour	7.29E-04	100	2600	0.41	0.0562	1%	-
Titanium dioxide	13463-67-7	120	PM Sch. 3 limit	24 hour	4.61E-03	100	2600	0.41	0.0562	8%	-
Aliphatic polyisocyanate resin	28182-81-2	3.00	Schedule 3	24 hour	1.04E-03	100	2600	0.41	0.0014	74%	-
Chromium	7440-47-3	0.500	Schedule 3	24 hour	5.87E-06	20	8700	0.41	0.0001	8%	-
Chromium (VI)	NA-CrVI	0.00035	Proposed Standard, PM-10 Fraction	24 hour	1.67E-07	20	8700	0.41	0.00000005	>100%	Yes

Contaminant	CAS #	MOECC POI Limit/AAQC/JSL value (ug/m3)	MOECC Publication Source	Averaging Period	Facility Emission Rate (g/s)	Shortest Distance from Source to Property Line (m)	Urban Dispersion Factor - 1 hr basis (ug/m3 per g/s)	1-hr to new hr basis - conversion factor	Site Specific Emission Threshold (g/s) Note 1	% of Site Specific Emission Threshold (Facility Rate (g/s)/ Emission Threshold (g/s))	Significant?
Cobalt	7440-48-4	0.00014	Schedule 3	Annual	1.11E-08	20	8700	0.08	0.0000001	11%	-
Cobalt	7440-48-4	0.100	AAQC	24 hour	1.11E-08	20	8700	0.41	0.0000140	0%	-
Manganese	13463-67-7	0.4	Schedule 3	24 hour	3.84E-06	20	8700	0.41	0.0001	7%	-
Nickel	7440-02-0	2.00	Schedule 3	24 hour	1.39E-05	20	8700	0.41	0.0003	5%	-
Nickel	7440-02-0	0.04	AAQC	Annual	1.39E-05	20	8700	0.08	0.0000292	48%	-
Particulate Matter	NA-PM	120	Schedule 3	24 hour	6.05E-02	20	8700	0.41	0.0168	**>100%**	**Yes**
Nitrogen oxides	10102-44-0	200	Schedule 3	24 hour	2.78E-01	20	8700	0.41	0.0280	**>100%**	**Yes**

Significant Contaminant

Total Significant Contaminants: **8**

Note 1 - Formula to calculate Site Specific Threshold Rate (g/s = 0.5*MOECC POI (ug/m3)/Dispersion factor (ug/m3 per g/s)

Appendix D-5

CD to be provided

Appendix D-6

CHEMINFO

Best Practices for the Reduction of Air Emissions From Construction and Demolition Activities

March, 2005

Prepared by:

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Construction and Demolition Multi-stakeholder Working Group

Prepared for:

Environment Canada
Transboundary Issues Branch

Table of Contents

Glossary of Terms

Actions to Reduce Emissions - Any applications of technologies or practices that contribute to reducing pollutant releases to the environment.

Active Operation - activity capable of generating fugitive dust, including any open storage pile, earthmoving activity, construction/demolition activity, disturbed surface area, and non-emergency movement of motor vehicles on unpaved roadways and parking lots.

Anemometer – device used to measure wind speed and direction.

Apron – material (e.g., asphalt, gravel) that covers a distance of the path travelled by construction vehicles at the entry/exit points from construction sites.

Asphalt – a brownish-black solid or semisolid mixture of bitumen obtained from native deposits or as a petroleum by-product and used in roofing and road building.

Bulk Material - any material including but not limited to earth, rock, silt, sediment, sand, gravel, soil, fill, aggregate less than 2 inches in length or diameter, dirt, mud, demolition debris, trash, cinders, pumice, saw dust and dry concrete, which are capable of producing fugitive dust at a construction site.

Coal Tar Pitch – a thick, dark, and sticky substance obtained from the distillation residue of coal tar.

Construction Activities – any on-site activities preparatory to or related to the building, alteration, rehabilitation or improvement of property, including, but not limited to the following activities: grading, excavation, trenching, loading, vehicular travel, crushing, blasting, cutting, planning, shaping, breaking, equipment staging/storage areas, weed abatement activities or adding or removing bulk materials from storage piles.

Cutback Asphalt – asphalt cement that has been liquefied by blending with petroleum solvents (diluents). Upon exposure to atmospheric conditions, the diluents evaporate, leaving the asphalt cement to perform its function.

Demolition Activities – the wrecking or taking out of any load-supporting structural member of a structure or building and related handling operations or the intentional burning of any structure or building.

Disturbed Surface Area – portion of the earth’s surface having been physically moved, uncovered, destabilized, or otherwise modified from its undisturbed natural condition, thereby increasing the potential for emission of fugitive dust. Disturbed surface area does not include areas restored to a natural state with vegetative ground cover and soil characteristics similar to adjacent natural conditions.

Dust Emissions - Releases to air of fine particulate matter (usually PM_{10}, $PM_{2.5}$)

Dust Generating Operation - any activity capable of generating fugitive dust, including but not limited to, land clearing, earthmoving, weed abatement by discing or blading, excavating, construction, demolition, material handling, storage and/or transporting operations, vehicle use and movement, the operation of any outdoor equipment or unpaved parking lots.

Dust Suppressant – water, hygroscopic materials, or non-toxic chemical stabilizers used as soil treatment to reduce fugitive dust emissions.

Earthmoving Operation – the use of any equipment for an activity which may generate fugitive dust, such as, but not limited to, cutting and filling, grading, levelling, excavating, trenching, loading or unloading of bulk materials, demolishing, blasting, drilling, adding to or removing bulk materials from open storage piles, back filling, soil mulching, landfill operations, or weed abatement by discing or blading.

Emulsified Asphalt – an emulsion of asphalt cement and water that contains a small amount of an emulsifying agent. It is a heterogeneous system containing two normally immiscible phases (asphalt and water) in which the water forms the continuous phase of the emulsion and minute globules of asphalt form the discontinuous phase.

Freeboard - the vertical distance between the top edge of a cargo container area and the highest point at which the bulk material contacts the sides, front and back of the container.

Fugitive Dust – any particulate matter becoming airborne, other than being emitted from an exhaust stack, directly or indirectly as a result of human activity.

Gravel Pad - a layer of washed gravel, rock or crushed rock which is at least one inch or larger in diameter, maintained at the point of intersection of a paved public roadway and a work site or source entrance to dislodge mud, dirt and/or debris from the tire of the motor vehicles or haul trucks prior to leaving the work site.

Grizzly - a device maintained at the point of intersection of a paved public roadway and a work site or source entrance to dislodge mud, dirt and/or debris from the tires of the motor vehicles or haul trucks prior to leaving the work site.

Haul Truck - any fully or partially open-bodied self propelled vehicle including any non-motorized attachments, such as but not limited to trailers or other conveyances which are connected to or propelled by the actual motorized portion of the vehicle used for transporting bulk material.

High Wind Conditions – when instantaneous wind speeds exceed 25 mph (40 kph).

Inactive Disturbed Surface Area – any disturbed surface area upon which active operations have not occurred or are not expected to occur for a period of 10 consecutive days.

Microgram (µg) – a metric unit of mass equal to one-millionth of a gram.

Micron - a metric unit of length equal to one millionth of a meter or 1/100th the width of a human hair.

Off-road Vehicle - any self-propelled conveyance specifically designed for off-road use, including not limited to, bulldozers, loaders, excavators, graders, off-road trucks, forklifts, all-terrain vehicles, utility vehicles, snow blowers and portable generator sets. A complete list of off-road vehicles and equipment can be found at the following website: www.ec.gc.ca/transport/offroad2004/offRoad_full_listing_e.htm

Opacity - the degree to which emissions reduce the transmission of light and obscure the view of an object in the background.

Open Storage Pile – any accumulation of bulk material with 5% or greater silt content not fully enclosed, covered or chemically stabilized, and attaining a height of three feet or more and a total surface area of 500 or more square feet.

Particulate Matter (PM) – the term for particles found in the air, including dust, dirt, soot, smoke, and liquid droplets. Some particles are large or dark enough to be seen as dust or smoke. Others are so small that individually they can only be detected with an electron microscope.

PM$_{10}$, - particulate matter that is less than 10 microns in diameter.

PM$_{2.5}$ - particulate matter that is less than 2.5 microns in diameter.

Power Take-off Equipment - an accessory that is mounted onto a transmission, allowing power to be transferred outside the transmission to a shaft or a driveline. Some examples of vehicles with power take-off equipment are cement mixers, trucks with hydraulic winches, car carriers, mobile cranes and sewer cleaning trucks.

Porosity –the fabric or materials of the fence/barrier will be greater than 50% of the entire surface area. The holes in the fence/barrier will be less than 50% of the entire surface area.

Practice for Emission Reduction - a pre-emptive or concurrent technique, or procedure to minimize the generation, emission, entrainment, suspension, and/or airborne transport of fugitive dust. Example: Driving slowly over unpaved road.

Public Roadway - any roadways that are open to public travel.

Road Construction - the use of any equipment for the paving or new construction of a road surface, street or highway.

Roofing Kettle – A device used to heat and melt asphalt or coal tar pitch so that the asphalt or coal tar pitch can be applied onto a rooftop to provide a protective coating.

Silt – any bulk material with a particle size less than 75 microns in diameter that passes through a Number 200 sieve as determined by the American Society of Testing Materials (ASTM) Test Method C136.

Stabilized – a condition where the soil surface is wet, crusted, covered or otherwise secured, so that dust particles do not become airborne even in high wind.

Stabilized Surface – any previously disturbed surface area or open storage pile which, through the application of dust suppressants, shows visual or other evidence of surface crusting and is resistant to wind-driven fugitive dust and is demonstrated to be stabilized.

Surfactant – a compound or element that reduces the surface tension of a liquid. The term is used in this document to describe wetting and spray adjuvants designed to promote the economical application of water to hydrophobic soils. Surfactants prevent drifting, decrease run-off, increase the penetrating and wetting properties, and promote more even, consistent spray patterns.

Technology For Emission Reduction – a piece of equipment, substance, device or related contrivance that serves to reduce emissions through its utilization. Example: application of dust suppressants on unpaved roads.

Trackout/Carryout – any and all bulk materials that adhere to and agglomerate on the exterior surface of motor vehicles, haul trucks, and/or equipment (including tires) and that have fallen onto a paved roadway. Material can be removed by a vacuum sweeper or a broom sweeper under normal operating conditions.

Trackout Control Device - a gravel pad, grizzly, wheel wash system, or a paved area, located at the point of intersection of an unpaved area and a paved roadway that controls or prevents vehicular trackout.

Transfer Point – a point in a conveying operation where an aggregate or other similar material is transferred to or from a belt conveyor, except where the material is being transferred to a stockpile.

Unpaved Road – any straight or curved length of well-defined travel way for motor vehicles not covered by one of the following: concrete, asphaltic concrete, or asphalt.

Wind Barrier - any structure put up along a source's boundaries to reduce the amount of wind blown dust leaving the site. Creating a wind barrier includes but is not limited to installing wind fencing, construction of berms, planting trees, or parking on-site equipment so that it blocks the wind.

Wind Fencing - a 1 to 1.5 metre (3 to 5 foot) barrier with 50% or less porosity located adjacent to roadways or urban areas.

Work Practices - a technique or operational procedure used to minimize the generation, emission, entrainment, suspension, and/or airborne transport of fugitive dust.

Wheel Shaker – a device capable of spreading the tread on tires and shaking the wheels and axles of vehicles for the purpose of releasing mud, soil and rock from the tires and undercarriage to prevent tracking those materials onto paved surfaces.

Wheel Washer – a station or device, either temporary or permanent, that utilizes a bath or spray of water for the purpose of cleaning mud, soil, and rock from the tires and undercarriage of vehicles to prevent tracking those materials onto paved surfaces.

List of Acronyms

CAC	Criteria Air Contaminants (PM, PM_{10}, $PM_{2.5}$, SOx, NOx, CO, VOC, Ammonia)
CCME	Canadian Council Of Ministers Of The Environment
C&D	Construction and Demolition
CEPA-99	Canadian Environmental Protection Act-1999
C&DWG	Construction and Demolition Multi-stakeholder Working Group
CO	Carbon Monoxide
COH	Coefficient of Haze
CWS	Canada-Wide Standard
EC	Environment Canada
EIA	Environmental Impact Assessment
EPA	U.S. Environmental Protection Agency
GHG	Greenhouse Gas
HEPA	High Efficiency Particulate Arrestor
HVLP	High Volume Low Pressure (Coating spray equipment)
JIA	Joint Initial Actions
kph	Kilometers per hour
KCAC	Keeping Clean Areas Clean
mph	Mile per hour
NOx	Nitrogen Oxides
PAH	Polycyclic Aromatic Hydrocarbons
PM	Particulate Matter
PM_{10}	Particulate Matter Less Than or Equal to 10 Microns in Diameter
$PM_{2.5}$	Particulate Matter Less Than or Equal to 2.5 Microns in Diameter
ppb	Parts Per Billion
ppm	Parts Per Million
SO_2	Sulphur Dioxide
VOC	Volatile Organic Compounds
TPM	Total Particulate Matter
TSP	Total Suspended Particulates
$\mu g/m^3$	Micrograms Per Cubic Meter (A microgram is one-millionth of a gram)
µm	Micron (one-millionth of a meter)

1. Introduction

1.1 Background

Construction and demolition activities emit pollutants that contribute to poor air quality and ground level ozone formation. The major pollutants emitted are particulate matter (PM), volatile organic compounds (VOCs), nitrogen oxides (NO_x) and sulphur dioxide (SO_2). Current emission estimates prepared by Environment Canada show that construction activities represent approximately 20% of total PM_T emissions and 15% of total PM_{10} emissions in Canada. Information on Canada's PM and other Criteria Air Contaminant (CAC) emissions inventories can be found at: http://www.ec.gc.ca/pdb/cac/cac_home_e.cfm.

Extensive scientific studies indicate that there are significant health and environmental effects associated with emissions of PM and other criteria air contaminants. As a result, the Canada-wide Standards (CWS) for PM and Ozone were signed in June 2000 by the Canadian Council of Ministers of the Environment (CCME). The CWS for $PM_{2.5}$ is 30 $\mu g/m^3$ averaged over 24 hours, to be achieved by 2010. The CWS for ozone is 65 ppb averaged over 8 hours, to be achieved by 2010.

Provinces, the territories, and the federal government are committed to emissions reduction in order to achieve all aspects of the CWS in Canada. As a result, the federal government is seeking the assistance of the construction and demolition sector in contributing their share to the emission reductions that have to be achieved in order to meet the CWS in 2010.

Included within the CWS are a series of Joint Initial Actions aimed at reducing PM emissions as well as precursor emissions to PM and ground level ozone. The Joint Initial Action for the construction and demolition sector included the development of a document that reflected the best current dust minimization and suppression methods available for use across Canada by authorities involved with construction and demolition activities.

Since construction and demolition activities are common to most jurisdictions and affect many communities across Canada, Environment Canada established the Construction and Demolition Multi-stakeholder Working Group to assist in the development of this Best Practices document.

1.2 Scope and Applicability

Technologies and work practices contained in this Best Practices document can be applied to reduce emissions from construction and demolition activities. These technologies and practices cover the full spectrum of construction project phases including design, site preparation, fabrication, landscaping, demolition and deconstruction, and renovation.

The focus of the document is on actions that can achieve reductions in PM and VOC emissions. This Best Practices document provides descriptions of a large number of technologies and practices that can address emissions of PM/VOCs, as well as some practices that may lead to reductions in sulphur oxides, nitrogen oxides and greenhouse gas emissions. These technologies/practices include both pollution prevention practices as well as options that control pollution after it has been generated. In the hierarchy of emissions reduction, pollution prevention practices are generally preferable and typically result in lower costs (or higher savings) than control options.

There are issues to take into consideration with respect to implementing the various technologies/practices to achieve PM and VOC emission reductions. These issues can include cost to implement, environmental consequences, and other factors that should be evaluated prior to selecting and implementing emission reduction options. For example, some of the practices to reduce PM emissions (e.g., application of water, dust suppressants) can facilitate the occurrence of other (just as serious) environmental issues. These are discussed further in Chapter 4.

This document should be useful to project owners, designers, managers, foremen, supervisors, contractors, and equipment operators interested in minimizing PM, VOC and other pollutant emissions at project sites. Provincial, municipal as well as federal government authorities concerned with minimizing potential emissions from construction and demolition activities can also use this document as a source of information to identify project-specific options that can be outlined in tender documents, so that all construction firms are bidding on the same scope of work.

1.3 Purpose of the Document

The purpose of this document is to provide a description of technologies and work practices that can reduce emissions associated with construction and demolition activities. Construction organizations and government authorities can evaluate these technologies and work practices in context of project-specific circumstances, which are often unique.

The intent of the document is not for organizations involved with construction and demolition activities to apply all of the technologies and practices described in the document. It is recognized that adoption of all elements of the document would not be economically feasible. Construction organizations, as well as government authorities need to consider economic, environmental, and technical circumstances in choosing the elements of the document that best suit the unique features of each project. Given the broad scope, diverse nature and unique environmental context of each construction project, it is not practical to prescribe in this document the actions and management requirements that should be undertaken for each project site.

1.4 Costs and Savings

Typically, there will be additional costs involved with reducing PM emissions (as well as emissions of other pollutants) from the construction and demolition sector. Since many of the firms within this sector are small to medium in size, operating on thin profit margins, these additional costs can represent a significant financial burden. However, construction companies in Canada already apply quite a number of work practices to reduce emissions. A recent survey of 17 small and large Canadian construction and demolition firms, by Cheminfo Services, found all were taking actions to reduce PM emissions.

Information related to the costs of achieving emission reductions within the Canadian construction and demolition sector can be found in the following publications available from Environment Canada:

- Cheminfo Services Inc., *Socio-economic Analysis of Emission Reductions in the Canadian Construction Industry*, March, 2005.
- Senes Consultants Ltd., *Foundation Analysis Report for the Canadian Construction and Demolition Sector*, March, 2004.

Construction companies can realize numerous benefits by reducing PM/dust and other pollutant emissions. Benefits may include: improved productivity, reduction in lost-time incidents for employees, improved corporate image and differentiation from competitors, avoided unnecessary involvement with regulators, as well as development and transfer/sale of knowledge and technology.

1.5 Acknowledgements and Further Information

This Best Practices document was developed with input from the Construction and Demolition Multi-stakeholder Working Group and its subcommittees, consisting of industry representatives, government personnel, and environmental non-government organizations (see Chapter 9 for the list of working group members). The contributions of all participants who assisted in developing this Best Practices document are gratefully acknowledged.

Inquiries and comments on this Best Practices document as well as requests for additional copies of the document should be directed to:

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Transboundary Air Issues Branch
Environment Canada
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2. Preparation of an Environmental Management Plan

2.1 Introduction

The development of a site-specific environmental management plan is recommended before any construction or demolition activities are initiated. An environmental management plan is a way to organize and document:

- the objectives to be achieved;
- the methods to be applied in addressing potential emissions;
- the people responsible for managing and implementing the plan; and
- the records to be maintained that can demonstrate adoption of actions contained in the Best Practices document, as well as compliance with any government environmental requirements.

Environmental management plans can range in size and detail depending upon the scope of the project. Ideally, the environmental management plan should address all pollutants to all media (air, water and soil), as well as management of solid and liquid wastes. It is therefore possible that the environmental management plan for air pollutants may be a component of a broader environmental strategy or even an Environmental Impact Assessment (EIA).

2.2 Contents of the Plan

The plan should first document the size, location, timing, prevailing winds, geographical features, landscape, and nature of the construction activities and relate them to communities and ecosystems that will be sensitive to potential emissions from the site. It is important to identify/recognize the target receptors that are in need of environmental protection from the potential emissions from construction activities. The evaluation and measurement of existing (pre-construction) environmental conditions can serve as a useful baseline of the environmental quality that is to be preserved during the various phases of construction. Prevention and reduction objectives should be documented relative to the anticipated emissions from construction activities to be undertaken. These can be qualitative (e.g., visual, zero neighbour complaints) as well as quantitative (e.g., maximum concentrations in air in or around the site, dust plume height).

The plan should include site-specific design elements, operating practices, specific technologies, products, and equipment that will be applied to prevent or control emissions. Differences in linear and area surface disturbances should be taken into account when identifying dust mitigation measures. In keeping with environmental principles, pollution prevention practices are preferred to controls that contain the pollution after it has been generated. Typically, pollution prevention practices are less costly to implement.

The plan should identify the frequency and duration over which these emission reduction practices are employed (e.g., one day, one week, one month, one year). The plan should also document any measurement, monitoring, and record keeping that will be used during the course of the project. Keeping records will allow construction site owners, managers, and operators to demonstrate compliance with local by-laws, permits, and other government environmental requirements. Records can also be used to show community members the actions that are being undertaken and their effectiveness in preserving the quality of their environment.

2.3 Further Information

To assist in the preparation of an environmental management plan, those within the construction industry are encouraged to obtain and review:

- Canadian Construction Association’s, “A Guide on Construction Environmental Management Planning” (http://www.cca-acc.com/documents/ccalist.html).
- Alberta Transportation’s, “Environmental Construction Operations Plan (ECO PLAN) Framework (http://www.trans.gov.ab.ca/Content/doctype245/production/eco5.pdf).

3. Index of Actions to Mitigate Emissions from the Construction and Demolition Sector

3.1 Introduction

The construction and demolition sector is a very diverse industry with project sites ranging in size from single family dwelling additions to multi-billion dollar heavy engineering projects. In addition, emissions occur at many different stages during construction and demolition operations, irrespective of the size and scope of the project. These and other factors result in challenges in presenting a Best Practices document that is comprehensive and representative of all potential construction situations, while being reader-friendly and concise.

Many of the work practices and technologies that are identified and described in this Best Practices document can be applied irrespective of the size and scope of the construction and demolition project. For example, most of the actions to address dust emitted from storage piles can be applied at just about any construction site. Therefore, it is useful to identify and describe the practices/technologies contained in this document according to emission sources. This should allow readers to quickly scan the Table of Contents and identify the pages in the Best Practices document where actions to mitigate emissions from specific sources can be found. This presentation also ensures that the Best Practices document is kept concise (i.e., avoids repeating the same practices).

One of the challenges associated with grouping and describing the work practices/technologies by emissions source is that there are some differences between the PM mitigation options that can be utilized by different segments of the industry. For instance, some actions that may be applicable to road construction companies are not relevant for firms that are building residential homes. It is difficult to identify where these distinctions are located within the Best Practices document when the practices/technologies are grouped by emission source. The Construction and Demolition Multi-stakeholder Working Group recommended that some method be applied to the Best Practices document to allow those in the industry to quickly identify which work practices/technologies are most relevant for their particular operations.

As a result, a series of cross-referenced tables have been prepared and presented in this chapter. These tables enable various construction firms to quickly identify the practices/technologies that are relevant for their operations. The utilization of this approach has allowed the various work practices to be presented in this Best Practices document both by emission source as well as by construction and demolition segment.

3.2 Presentation of Cross-Referenced Tables

The segmentation of the construction industry that has been chosen for this document is as follows:

- Residential Building Construction Operations;
- Industrial, Commercial and Institutional Construction Operations;
- Road-building and Other Heavy Construction Operations; and
- Demolition and Deconstruction.

The work practices/technologies that are relevant for firms within these segments are presented in tables on the following four pages. Note that the use of pollution prevention practices to mitigate emissions are preferred and consequently these options have been bolded in the various tables.

Table 1: Summary of Practices for Residential Building Construction Operations

Guidance On	Practices to Reduce Emissions	Page
Water Application	**Wide range of practices applied to site preparation, storage, etc.**	9-10
Dust Suppressants	**Wide range of practices applied to site preparation, storage, etc.**	9, 11
Design	**Plan for minimizing dust generation**	12
	Choose building materials to reduce dust generation	12
	Minimize distances travelled for delivery of materials	14
	Use green building materials	14
	Design and construct for maximum energy efficiency	15
Site Preparation	**Grade the construction site in phases**	16
	Utilize wind fencing	16
	Stabilize surfaces of completed earthworks with vegetation	16
	Stabilize earthworks with stone/soil/geotextiles	17
	Create ridges to prevent dust	17
	Compact disturbed soil	17
	Eliminate open burning	17
	Reduce certain activities during windy conditions	18
Storage Piles	**Storage pile activity should be conducted downwind**	18
	Utilize enclosures/coverings for storage piles	18
	Utilize wind fences/screens for storage piles	18
	Use vegetation cover as a wind break	19
	Properly shape storage piles	19
	Properly schedule the delivery of landscaping materials	19
Vehicles and Equipment	Use diesel particulate filters, fuel-borne catalysts, diesel oxidation catalysts	27-28
	Ensure catalytic converters are operating efficiently	28
	Evaluate alternative technologies to reduce emissions	28
	Properly maintain engines and exhaust systems	29
	Use low sulphur diesel	29
	Alternative fuels should be utilized where feasible	29
	Reduce or eliminate idling time	30
	Evaluate alternatives for heat and air conditioning	30
	Minimize cold starts	30
	Evaporative losses should be minimized	31
Asphalt Roofing	**Temperatures of material inside kettles should be minimized**	38
	Close fitting lids on roofing kettles should be used	38
	Kettle should be kept closed	38
	Roofing kettles should be equipped with afterburners	38

Guidance On	Practices to Reduce Emissions	Page
Material Handling & Transfer Systems	**Control mud and dirt trackout and carryout**	19
	Minimize material drop at the transfer point and enclosure	21
	Utilize foam suppression systems	21
	Secure loads on haul trucks	21
	Prevent PM emissions from spills	22
	Minimize material handling operations	22
	Capture fugitive dust emissions	22
	Utilize wind barriers	22
	Reduce certain activities during windy conditions	22
Road Surfaces	**Establish on-site vehicle restrictions**	23
	Surface improvements to unpaved road surfaces	23
	Proper maintenance of unpaved roads	23
	Work practices associated with de-icing materials	23
Fabrication	**Cutting, grinding and drilling**	24
	Avoiding cutting and grinding	24
	Sand and grit blasting and façade cleaning	24
	Concrete cutting	25
	Mixing processes	25
	Internal and external finishing and refurbishment	25
Surface Coatings	**Durable and high performance coatings with a low VOC content should be used**	32
	Minimize emissions from storage, handling & preparation	33
	Minimize coatings wastage through spillage/splashing	34
	Surface to be coated should be properly prepared	34
	Paint heaters should be used instead of paint thinners	34
	Technologically advanced spray-guns should be utilized	34
	Apply correct application techniques	35
	Proper technique should be used when cleaning spray guns	35
	Alternative coating application techniques should be used	36
	Alternative cleaners or low-VOC cleaners should be used	36
	Solvents used for cleaning should be minimized	36
	Paint colour changes should be optimized	36
	Alternative finishing practices should be used	37

Table 2: Summary of Practices for Industrial, Commercial and Institutional Operations

Guidance On	Practices to Reduce Emissions	Page
Water Application	**Wide range of practices applied to site preparation, storage, etc.**	9-10
Dust Suppressants	**Wide range of practices applied to site preparation, storage, etc.**	9, 11
Design	**Plan for minimizing dust generation**	12
	Choose building materials to reduce dust generation	12
	Minimize distances travelled for delivery of materials	14
	Use green building materials	14
	Design and construct for maximum energy efficiency	15
Site Preparation	**Grade the construction site in phases**	16
	Utilize wind fencing	16
	Stabilize surfaces of completed earthworks with vegetation	16
	Stabilize earthworks with stone/soil/geotextiles	17
	Create ridges to prevent dust	17
	Compact disturbed soil	17
	Eliminate open burning	17
	Reduce certain activities during windy conditions	18
Storage Piles	**Storage pile activity should be conducted downwind**	18
	Utilize enclosures/coverings for storage piles	18
	Utilize wind fences/screens for storage piles	18
	Use vegetation cover as a wind break	19
	Properly shape storage piles	19
	Properly schedule the delivery of landscaping materials	19
Vehicles and Equipment	Use diesel particulate filters, fuel-borne catalysts, diesel oxidation catalysts	27-28
	Ensure catalytic converters are operating efficiently	28
	Evaluate alternative technologies to reduce emissions	28
	Properly maintain engines and exhaust systems	29
	Use low sulphur diesel	29
	Alternative fuels should be utilized where feasible	29
	Reduce or eliminate idling time	30
	Evaluate alternatives for heat and air conditioning	30
	Minimize cold starts	30
	Evaporative losses should be minimized	31
Asphalt Roofing	**Temperatures of material inside kettles should be minimized**	38
	Close fitting lids on roofing kettles should be used	38
	Kettle should be kept closed	38
	Roofing kettles should be equipped with afterburners	38
Material Handling & Transfer Systems	**Control mud and dirt trackout and carryout**	19
	Minimize material drop at the transfer point and enclosure	21
	Utilize foam suppression systems	21
	Secure loads on haul trucks	21
	Prevent PM emissions from spills	22
	Minimize material handling operations	22
	Capture fugitive dust emissions	22
	Utilize wind barriers	22
	Reduce certain activities during windy conditions	22
Road Surfaces	**Establish on-site vehicle restrictions**	23
	Surface improvements to unpaved road surfaces	23
	Proper maintenance of unpaved roads	23
	Work practices associated with de-icing materials	23
Fabrication	**Cutting, grinding and drilling**	24
	Avoiding cutting and grinding	24
	Sand and grit blasting and façade cleaning	24
	Concrete cutting	25
	Mixing processes	25
	Internal and external finishing and refurbishment	25
Surface Coatings	**Durable and high performance coatings with a low VOC content should be used**	32
	Minimize emissions from storage, handling & preparation	33
	Minimize coatings wastage through spillage/splashing	34
	Surface to be coated should be properly prepared	34
	Paint heaters should be used instead of paint thinners	34
	Technologically advanced spray-guns should be utilized	34
	Apply correct application techniques	35
	Proper technique should be used when cleaning spray guns	35
	Alternative coating application techniques should be used	36
	Alternative cleaners or low-VOC cleaners should be used	36
	Solvents used for cleaning should be minimized	36
	Paint colour changes should be optimized	36
	Alternative finishing practices should be used	37

Table 3: Summary of Practices for Road-building and Other Heavy Construction Operations

Guidance On	Practices to Reduce Emissions	Page
Water Application	**Wide range of practices applied to site preparation, storage, etc.**	9-10
Dust Suppressants	**Wide range of practices applied to site preparation, storage, etc.**	9, 11
Design	**Plan for minimizing dust generation**	12
	Choose building materials to reduce dust generation	12
	Mitigate traffic congestion	13
	Minimize distances travelled for delivery of materials	14
	Use green building materials	14
	Design and construct for maximum energy efficiency	15
Site Preparation	**Grade the construction site in phases**	16
	Utilize wind fencing	16
	Stabilize surfaces of completed earthworks with vegetation	16
	Stabilize earthworks with stone/soil/geotextiles	17
	Create ridges to prevent dust	17
	Compact disturbed soil	17
	Eliminate open burning	17
	Reduce certain activities during windy conditions	18
Storage Piles	**Storage pile activity should be conducted downwind**	18
	Utilize enclosures/coverings for storage piles	18
	Utilize wind fences/screens for storage piles	18
	Use vegetation cover as a wind break	19
	Properly shape storage piles	19
	Properly schedule the delivery of landscaping materials	19
Vehicles and Equipment	Use diesel particulate filters, fuel-borne catalysts, diesel oxidation catalysts	27-28
	Ensure catalytic converters are operating efficiently	28
	Evaluate alternative technologies to reduce emissions	28
	Properly maintain engines and exhaust systems	29
	Use low sulphur diesel	29
	Alternative fuels should be utilized where feasible	29
	Reduce or eliminate idling time	30
	Evaluate alternatives for heat and air conditioning	30
	Minimize cold starts	30
	Evaporative losses should be minimized	31
Hot Mix Asphalt Production	**Maintenance, inspections, calibration, low-sulphur fuels**	31-32
Asphalt Concrete Paving	**Minimization of cutback and emulsified asphalts, other options**	37

Guidance On	Practices to Reduce Emissions	Page
Material Handling & Transfer Systems	**Control mud and dirt trackout and carryout**	19
	Minimize material drop at the transfer point and enclosure	21
	Utilize foam suppression systems	21
	Secure loads on haul trucks	21
	Prevent PM emissions from spills	22
	Minimize material handling operations	22
	Capture fugitive dust emissions	22
	Utilize wind barriers	22
	Reduce certain activities during windy conditions	22
Road Surfaces	**Establish on-site vehicle restrictions**	23
	Surface improvements to unpaved road surfaces	23
	Proper maintenance of unpaved roads	23
	Work practices associated with de-icing materials	23
Fabrication	**Cutting, grinding and drilling**	24
	Avoiding cutting and grinding	24
	Sand and grit blasting and façade cleaning	24
	Concrete cutting	25
	Mixing processes	25
	Internal and external finishing and refurbishment	25
Surface Coatings	**Durable and high performance coatings with a low VOC content should be used**	32
	Minimize emissions from storage, handling & preparation	33
	Minimize coatings wastage through spillage/splashing	34
	Surface to be coated should be properly prepared	34
	Paint heaters should be used instead of paint thinners	34
	Technologically advanced spray-guns should be utilized	34
	Apply correct application techniques	35
	Proper technique should be used when cleaning spray guns	35
	Alternative coating application techniques should be used	36
	Alternative cleaners or low-VOC cleaners should be used	36
	Solvents used for cleaning should be minimized	36
	Paint colour changes should be optimized	36
	Alternative finishing practices should be used	37
Traffic Markings	**Alternatives to VOC coatings, use minimization techniques**	37
Asphalt Roofing Kettles	**Minimize temperatures, close fitting lids, vents, afterburners**	38

Table 4: Summary of Practices for Demolition and Deconstruction Operations

Guidance On	Practices to Reduce Emissions	Page
Water Application	**Wide range of practices applied to site preparation, storage, etc.**	9-10
Dust Suppressants	**Wide range of practices applied to site preparation, storage, etc.**	9, 11
Storage Piles	**Storage pile activity should be conducted downwind**	18
	Utilize enclosures/coverings for storage piles	18
	Utilize wind fences/screens for storage piles	18
	Use vegetation cover as a wind break	19
	Properly shape storage piles	19
Material Handling & Transfer Systems	**Control mud and dirt trackout and carryout**	19
	Minimize material drop at the transfer point and enclosure	21
	Utilize foam suppression systems	21
	Secure loads on haul trucks	21
	Prevent PM emissions from spills	22
	Minimize material handling operations	22
	Capture fugitive dust emissions	22
	Utilize wind barriers	22
	Reduce certain activities during windy conditions	22
Road Surfaces	**Establish on-site vehicle restrictions**	23
	Surface improvements to unpaved road surfaces	23
	Proper maintenance of unpaved roads	23
	Work practices associated with de-icing materials	23

Guidance On	Practices to Reduce Emissions	Page
Demolition and Deconstruction	**Apply deconstruction techniques**	26
	Minimize drop heights for debris	26
	Enclose chutes and cover bins	26
	Use fogging systems	26
	Barriers to prevent dispersion	26
	Avoid blasting when feasible	26
	Vacuum debris	26
	Work practices for loading debris	26
	Avoid prolong storage of debris	26
Vehicles and Equipment	Use diesel particulate filters, fuel-borne catalysts, diesel oxidation catalysts	27-28
	Ensure catalytic converters are operating efficiently	28
	Evaluate alternative technologies to reduce emissions	28
	Properly maintain engines and exhaust systems	29
	Use low sulphur diesel	29
	Alternative fuels should be utilized where feasible	29
	Reduce or eliminate idling time	30
	Evaluate alternatives for heat and air conditioning	30
	Minimize cold starts	30
	Evaporative losses should be minimized	31

4. Using Water and Chemical Dust Suppressants at Construction Sites

4.1 Introduction

There are numerous PM emission sources at construction sites where water and various chemical dust suppressants can be applied in order to reduce emissions. For instance, water/dust suppressants can be applied to mitigate fugitive dust from site preparation, storage piles, materials handling and transfer, unpaved roads, etc. The discussion related to the utilization of these dust control options has been confined to this chapter. This serves to reduce the length of the Best Practices document and also makes the document more reader-friendly.

The application of water is typically the most common dust control method that is employed by construction companies across Canada. Practically all construction companies that are implementing options to reduce dust are applying water to mitigate dust generation from at least one emission source on their construction site. Water can be applied by a variety of methods, for instance trucks, water pulls, water canons, hoses, fire hydrants, sprinklers, etc.

A variety of chemical dust suppressants are available to suppress fugitive dust emissions from construction sites. While being more expensive that water, they are also more effective in suppressing dust and have to be applied much less frequently. Examples of dust suppressants include the following: (i) liquid polymer emulsions (ii) agglomerating chemicals (e.g., lignosulfonates, polyacrylamides); (iii) cementitious products (e.g., lime-based products, calcium sulphate); (iv) petroleum based products (e.g., petroleum emulsions); and (v) chloride salts (e.g., calcium chloride and magnesium chloride).

While the application of water and chemical dust suppressants are proven and effective options for mitigating dust, they have to be applied judiciously. Their usage, while mitigating dust, can trigger other (just as serious) environmental consequences. It is important to keep these environmental consequences in mind when deciding on the extent to which water and chemical dust suppressants are to be utilized.

4.2 Factors to Consider

The following potential environmental impacts of applying chemical dust suppressants must be taken into consideration before application:

- the hazardous, biodegradable and water-soluble properties of the substance;
- the effect their application could have on the surrounding environment, including water-bodies (e.g., surface water pollution from runoff, contaminated ground water, pH) and wildlife (e.g., fisheries); and
- whether the use of chemicals has been limited due to nearby watershed considerations for protection of fish and fish habitat from surface runoff.

There are potential environmental consequences resulting from the over-application of water that must be considered. These include: runoff problems; soil instability; spreading of contaminants in the environment (e.g., oil or coolant from engines), and erosion. In addition, consideration should be given to water conservation or water allocation limitations in areas where construction occurs.

The over-application of water can also lead to equipment mobility problems and reduce the ability of earth-moving equipment to efficiently move saturated soils. If the moisture contents of soils used in construction are sufficient, water may not always need to be added prior to handling, crushing, etc.

Table 5: Guidance on Applying Water at Construction Sites

Stage	Guidance on the Application of Water
Site Preparation	• Water may be applied prior to earthmoving activities to increase the moisture content of the soils thereby increasing their stability. The pre-application of water may be to the depth of the proposed cuts or equipment penetration. The area should continue to be pre-wetted if it is not moist to the depth of the cut. • After grading the construction site, water should be applied within active earth-moving areas at sufficient frequency and quantity to prevent visible emissions from extending more than 30 meters from the point of origin. Schedule thorough and consistent watering that does not run off the site throughout the duration of the construction project. At the end of each workday, water trucks may treat all exposed areas to create a stabilizing crust on the soil. Water may also be applied at the end of the day to soak the next day's work area. Water may be applied into the backfill material until the optimum moisture level is reached. • Water may be applied continuously in front of earthmoving equipment by means of water truck/water pull. If the soil is dry, the earthmoving equipment should cease further disturbance when the water truck/water pull runs out of water and should not resume until the water truck/water pull is operational again. Optimally, one water truck may work for every 1-3 pieces of heavy earthmoving equipment that are in operation, depending on soil and weather conditions (if practical). • Water may be applied on a daily basis to all inactive disturbed surface areas, where there has been no activity for seven days or more days. Water may be applied with sufficient frequency to prevent visible emissions (at least every 2 hours). Automatic sprinkler or spray bar systems are optimal in these areas. • Construction sites should employ a sufficient number of water trucks and have back-up water trucks available if the site experiences dust control problems. • Perimeter watering system or fence line misting consisting of portable irrigation equipment may be applied to mitigate dust impacting surrounding residences and businesses.
Storage Piles	• For some materials, hard crusts can be built-up on storage piles by application of water. Crusts reduce the dust blown off the storage piles. Care is required to avoid application of water to a degree that may erode or settle the fines to the bottom of the pile. • Water may be applied to at least 80% of the surface area of all open storage piles on a daily basis when there is evidence of wind driven fugitive dust. • Storage piles that are greater than 2.5 metres (8 feet) in height and not covered may have a road bladed to the top to allow water truck access or should have an operational water irrigation system that is capable of complete stockpile coverage (water truck access on large volume aggregate storage piles is unrealistic).
Material Handling and Transfer Systems	• Material to be transported may be mixed with water prior to loading and/or the entire surface area of material may be watered after loading. Water should be available while loading and unloading in order to prevent visible dust plumes. • Material may be tested to determine moisture content and silt loading. Only materials that have optimum moisture content should be crushed or screened. • Materials may be sprayed with water 15 minutes prior to handling and/or at points of transfer. • Water may be applied at the feed and/or intermediate points in the conveyor system as needed. • Washing separated or screened materials are effective in controlling fugitive dust emissions from chutes and conveyors. • Hollow cone nozzles are believed to produce the greatest control while minimizing clogging when using wet suppression systems. Optimal droplet size for surface impaction and fine particle agglomeration is about 500 μm - finer droplets are affected by drift and surface tension and appear to be less effective. • Application of water sprays to the underside of a conveyor belt improves the performance of wet suppression systems at belt-to-belt transfer points.
Road Surfaces	• Water may be applied to all unpaved roads used for vehicular traffic at least once per every two hours of active operations (i.e., 3 times per normal 8 hour working day). If the area is inaccessible to water trucks due to slope conditions or other safety factors, watering may be conducted with hoses or sprinkler systems. Runoff should be controlled so it does not saturate the surface of the unpaved haul road, therefore increasing the potential of trackout. • Control efficiency of water depends on: (i) amount (per unit road surface area) of water added during each application; (ii) period of time between applications; (iii) weight, speed and number of vehicles traveling over the watered road during the period between applications; and (iv) metrological conditions that affect evaporation.
Demolition and Deconstruction	• Water may be applied at the following times/locations in order to minimize dust generation: (i) the exterior of building surfaces prior to initiating demolition activities as well as continuously during the knock down phase. It has been suggested that all exterior surfaces of the building, up to six stories in height (where feasible), may be wetted before and during the use of the wrecking ball; (ii) debris pile immediately following blasting and as needed afterwards; (iii) debris during handling and haulage operations; (iv) the surrounding surface area following demolition; (v) unpaved road surfaces within 30 meters of the demolition site, 1 hour prior to the actual demolition; and (vi) unpaved surface areas where equipment will operate.

Table 6: Guidance on Applying Dust Suppressants/Chemical Stabilizers

Stage	Guidance on the Application of Dust Suppressants/Chemical Stabilizers
Site Preparation	• Chemical stabilizers may be applied to graded areas within 5 working days of grading completion. In addition, if an area having 0.2 hectares or more of disturbed surface area remains unused for 7 or more days, the surface area should be stabilized. Chemical stabilizers are generally only effective in areas that are not subject to daily disturbances. Vehicle traffic and disturbance of stabilized soils should be limited through the use of fencing, ditches, barriers, barricades and/or wind barriers. • Chemical stabilizers should be applied according to the manufacturers specifications. • The effectiveness and longevity of chemical stabilizers can be affected by the rate of application, soil pH, moisture levels in the air or soil, amount of sunlight, plant growth and traffic. • Construction operators may consider the addition of water-soluble surfactants to water. These surfactants increase the wetting power of water by breaking down the initial resistance of dry soils to water. Surfactants are relatively inexpensive and greatly decrease the amount of water necessary during dust control operations.
Storage Piles	• Disturbed areas of a construction site, including storage piles of fill dirt and other bulk materials, that are not being actively utilized for construction purposes for a period of 7 calendar days or more, should be stabilized with a chemical dust stabilizer or suppressant. • A much more effective technique (than applying water to the storage pile) is to apply chemical agents (such as surfactants) directly to the storage pile, which permit more extensive wetting. Surfactants allow particles to more easily penetrate the water droplet and increase the total number of droplets, thus increasing total surface area and contact potential. • Foam can be used instead of chemical surfactants to reduce fugitive dust emissions from storage piles (as well as material handling operations). Foam is generated by adding a chemical (i.e., detergent-like substance) to a relatively small quantity of water that is then vigorously mixed to produce small bubbles, high-energy foam.
Material Handling & Transfer	• Dust suppressants should be applied and maintained prior to and after to stabilize screened materials and surrounding area after screening. • Material being transported in a vehicle should be sprayed with a dust suppressant.
Road Surfaces	• The control effectiveness of chemical dust suppressants depends on: (i) the dilution rate used in the mixture; (ii) the application rate (volume of solution per unit road surfaced area); (iii) the time between applications; (iv) the size, speed and amount of traffic during the period between applications; and (v) meteorological conditions (rainfall, freeze/thaw cycles, etc.) during the period. • Chemical dust suppressants have much less frequent reapplication requirements as compared to water. • Dust suppressants are generally applied to the road surface as a water solution and should be uniformly applied to all areas disturbed by vehicles. When used to stabilize heavily trafficked areas, dust suppressants typically require ground preparation prior to application and reapplication 1-4 times a year to remain effective. • Because most chemical products need to soak into the soil, they generally require above-freezing temperatures to work (exceptions include magnesium chloride and calcium chloride). Calcium chloride and magnesium chloride are the most commonly used dust suppressants for unpaved roads. Proper road surface preparation, grading and scarification is required before applying calcium chloride or magnesium chloride. It should be noted that calcium chloride and magnesium chloride use may be restricted in certain areas by municipal or provincial authorities. Environment Canada's *Best Practices For The Use And Storage Of Chloride-Based Dust Suppressants*, (March 2004) provides guidance on the application of chloride-based dust suppressants. • For greatest effectiveness and lowest cost it is important to follow the manufacturer's instructions for mixing and applying these chemicals. • PVA polymers, acrylic copolymers, and water-emulsified petroleum resins, etc. can also be used to mitigate dust generation on unpaved roads. • Surfactants can be added to the watering operation to increase fugitive dust control. Surfactants are agents that break the surface tension of the water that allows for better penetration and saturation of the soil particles.
Demolition and Deconstruction	• Dust suppressants/chemical stabilizers may be applied during the following situations: (i) unpaved surface areas within 30 meters (100 feet) where materials from demolition will fall; (ii) debris piles immediately following blasting and periodically afterwards; (iii) the surrounding area following demolition; and (iv) unpaved surface areas where equipment will operate.

5. Design Considerations to Reduce Emissions from Construction and Buildings

5.1 Introduction

Proper planning during the design stage of construction projects can effectively reduce emissions generated during construction and lifecycle emissions. Suitable design can also minimize emissions during demolition or deconstruction. Design considerations to reduce emissions associated with construction projects include the following:

- site planning;
- building materials used;
- minimizing vehicle traffic congestion;
- minimizing distances travelled for delivery of construction materials;
- utilizing "green" building materials; and
- constructing buildings to maximize energy efficiency.

5.2 Plan for Minimizing Dust Generation

Site planning should be conducted in order to maximize construction efficiency and consequently minimize emissions. The layout of the construction site should be designed to minimize fugitive dust generation potential, including access roads, entrances and exits, storage piles, vehicle staging areas, and other potential sources of dust emissions.

One of the most critical design considerations that should be implemented is to develop a site dust management plan. The dust management plan should identify potential fugitive emission sources from the construction operation. This can be accomplished by starting with a facility site map. All paved haul roads, unpaved haul roads, stockpiles, material transfer points, material conveyances, parking lots, staging areas, and other open areas subject to wind erosion should be identified on the map. The prevailing wind direction should also be identified on the map.

Daily traffic volumes should be studied in order to determine whether roads and open areas are used frequently or occasionally. Daily routine traffic modifications should be considered that will reduce traffic in some areas or eliminate it altogether. The appropriate dust control method for each source identified on the map should be determined. For each source and each control method identified, the frequency of application should be defined. A self-inspection checklist should be prepared in order to be able to record the scheduled applications.

Other site planning considerations that can serve to reduce dust generation during the construction project, include the following:

- before construction operations are initiated, a survey should be conducted that assesses materials/tools/equipment to be used/handled. Decisions can then be make with respect to appropriate materials/tools/equipment that will serve to minimize dust generation; and
- infrastructure repair and maintenance should be co-ordinated – e.g., water, sewer and electrical underground work should be carried out in sequence rather than having to dig up and repave the road several times.

Sensitive receptors in the area (e.g., schools, hospitals, wildlife in urban areas, etc.) that require environmental protection from dust generation should be identified and taken into consideration when designing dust mitigation strategies.

5.3 Choose Building Materials to Reduce Dust Generation

The proper choice of building materials to be used at construction sites can serve to reduce the generation of fugitive dust during the construction phase as well as during the lifetime of the structure. Pre-fabricated materials and modular construction units should be used whenever possible. These units are delivered to the construction site in a finished state, which reduces the amount of cutting, grinding, etc. (and consequently on-site dust emissions) that is required at the construction site. Potential emissions at the factory where the pre-fabricated materials/modular construction units are made should be suitably addressed through effective pollution control measures. It is easier to implement emission reductions at large enclosed permanent facilities than at open construction sites.

Examples of pre-fabricated components include pre-mixed brick mortar, exterior wall systems and shot-crete. Shot-crete is a concrete product sprayed in place for footings on buildings. Shot-crete can be mixed on-site or premixed and delivered to the site ready for use. Using pre-mixed shot-crete reduces the emissions associated with its preparation on site. This can involve emissions associated with storage, handling and mixing of cement and aggregates. The use of modular components (e.g., walls that can be dismantled) minimizes waste and dust generated during retrofits of a floor or deconstruction of the building.

Improving construction quality increases the service life of buildings and other constructed structures. This reduces the need for maintenance, rehabilitation and reconstruction of structures. Often rehabilitation and reconstruction can produce more emissions than the original construction. Therefore, improving construction quality provides numerous lifecycle emissions benefits.

New developments in material science and their applications continue to provide opportunities for construction operations to reduce emissions. Continual improvements are being made to the quality and durability of construction materials. Increased material durability results in extended service life of structures, pavements, etc. and consequently reduced lifecycle emissions (as less frequent repairs and replacement of materials is required as well as the fact that the overall structure will last longer). The most advanced construction materials should be used, whenever possible, in construction projects.

Many North American jurisdictions are promoting the use of recycled materials. Currently, several existing material specifications, including asphalt, concrete, and granular, allow for partial incorporation of recycled material. Material specifications should require that the contractor use a greater percentage of recycled material for some construction operations including hot mix paving and resurfacing, concrete structures and general concrete construction, and the construction of granular base and ‘shouldering’ operations. Fly-ash (by-product of coal combustion at electric power generation stations) which is used as a replacement for Portland cement in ready-mix concrete can also result in reduced lifecycle emissions as it reduces the amount of Portland cement that has to be produced.

All of these options can result in reduced lifecycle emissions. It should be noted that care must be exercised to ensure that the increased use of recycled material does not result in reduced stability and safety of structures.

When designing walls, standard dimensions should be incorporated to match standard dimension modules. This reduces the amount of material cutting and related dust emissions. For dry wall systems, “dustless” filler compound is available to joint filling. This reduces the amount of dust generated during sanding of joints.

5.4 Mitigate Traffic Congestion

Traffic delays result from road closures, lane closures, and lane narrowing which cause vehicle speed reduction on roads and highways. Delays result in increased emissions from vehicle engines travelling slowly through the construction zone. Options to consider that increase traffic flow and thereby mitigate potential emissions are: adding a new lane on the shoulder; carrying out activities one lane at a time; and re-routing traffic.

Rapid on-site construction would reduce the duration of traffic interference and therefore reduce emissions from traffic delay. Several strategies have been investigated by the U.S. Transportation Research Board to reduce the duration of on-site road construction. In addition to ways of improving production rates, off-site fabrication of structures such as bridges also reduce on-site construction time. Off-site fabrication of structural components can also enhance the quality of work, as the production takes place in controlled settings and external factors such as weather and traffic do not interfere. Enhanced structural quality will result in extended lifecycle of structures and thus result in reduced lifecycle emissions.

5.5 Minimize Distances Travelled for Delivery of Materials

The delivery of materials such as concrete, asphalt and aggregates to construction sites can generate significant amounts of road dust and result in increased vehicle emissions, especially for sites that are relatively far from material manufacturers. Some material deliveries can be eliminated by establishing temporary, portable concrete and/or asphalt plants, located on construction sites. This practice may be feasible for large-size projects that require substantial quantities of these materials. However, in many cases these portable plants will not be feasible due to the costs involved (e.g., installation, permitting, etc.). Establishing temporary plants would reduce the number of transport trucks travelling on public and on-site roads.

5.6 Use Green Building Materials

Green building materials should be selected whenever possible in order to reduce emissions associated with the lifecycle of the building. Alternative paints, flooring, windows, insulation, walls, and other construction materials should be evaluated. There is an extensive amount of information on green building materials located on the internet. The following sites can be accessed to help identify green building materials that are most applicable and appropriate for specific construction activities:

- Canadian Green Building Council (http://www.cagbc.org/);
- Leadership in Energy and Environmental Design (LEED Canada) (http://www.cagbc.ca/building_rating_systems/leed_rating_system.php);
- Canadian Construction Association’s Green Building Resource Centre (http://www.cca-acc.com);
- Athena Sustainable Materials Institute (http://www.athenasmi.ca/)
- Master Painters Institute (http://www.paintinfo.com/mpi/)
- Canadian Mortgage and Housing Corporation Healthy Housing (http://www.cmhc.ca/en/imquaf/hehosu/index.cfm)
- Green Globes Canada http://www.greenglobes.com/design/homeca.asp
- U.S. Green Building Council (http://www.usgbc.org/);
- Leadership in Energy and Environmental Design (LEED U.S.) (http://www.usgbc.org/LEED/LEED_main.asp).
- Environmental Choice Program (www.environmentalchoice.com)

5.6.1 Choosing Road Surface Type

The best road surface for reduction of emissions depends largely on the situation (the type of surface put on a road, such as gravel, chip seal, or concrete, is based on the level of traffic and amount of heavy loads carried). Different surface types require different amounts of aggregate materials as a base (concrete pavement structures have less aggregate than asphalt structures). Proximity of aggregate materials also plays a role in the cost of the pavement structure and potentially on the pavement chosen. The amount of digging and earth moving also varies according to road surface type. Less subgrade width is normally required for a concrete pavement than an asphalt pavement. In addition, less blasting is required due to the narrower subgrade.

5.7 Design and Construct for Maximum Energy Efficiency

There are many opportunities to improve the energy efficiency of buildings and consequently reduce their lifecycle emissions (e.g., selection of appliances, heating and cooling, home electronics, lighting, office equipment, etc.). The following resources should be accessed in order to identify additional information:

- The Canadian *Model National Energy Code for Buildings* is a model energy efficiency code published in September 1997 by the National Research Council of Canada (NRCC). The code sets minimum energy efficiency standards for commercial building construction in Canada. Details on how to obtain the *Model National Energy Code for Buildings* can be found at http://irc.nrc-cnrc.gc.ca/catalogue/energy2.html.
- The Model National Energy Code of Canada for Houses provides assistance in designing energy-efficient housing that minimize air-conditioning and heating bills given construction cost trade-offs. This code applies to single family houses of three story's or less, and to additions of more than 10m^2. Details on how to obtain the Model National Energy Code of Canada for Houses can be found at: http://irc.nrc-cnrc.gc.ca/catalogue/energy1.html.
- Natural Resources Canada's R-2000 Program promotes the use of cost-effective energy-efficient building practices and technologies. (http://oee.nrcan.gc.ca/r-2000/).

6. Reducing Fugitive Dust Emissions From Construction and Demolition Sites

6.1 Introduction

This section of the Best Practices document identifies and describes various technologies and work practices that can be applied to minimize fugitive dust emissions during construction and demolition activities. The various actions have been described under the following construction activities that generate fugitive dust emissions:

- Site preparation;
- Storage piles;
- Material handling and transfer systems;
- Road surfaces;
- Fabrication processes; and
- Demolition and deconstruction.

6.2 Site Preparation

Site preparation steps such as earthworks, excavation, soil stripping, clearing and grubbing, earthmoving and landscaping, can result in significant dust emissions, especially during dry weather periods and particularly if followed by high winds. Outlined below are various work practices and technologies that may be employed prior to, during and after the site preparation process in order to minimize dust emissions.

6.2.1 Grade the Construction Site in Phases

Each area of the construction site should be graded separately (i.e., not all at once), timed to coincide with the actual construction in that area. This allows vegetation and cover to remain intact within the construction zone, until just prior to construction occurring on that segment of the construction site. Construction should be started at the location that is upwind from the prevailing wind direction. Phasing is considered to be especially critical for project sites greater than 40 hectares in size.

6.2.2 Utilize Wind Fencing

Permanent perimeter or temporary interior fencing should be installed within construction sites as early in the construction operation as possible. Detailed guidance on wind fencing includes the following:

- One to two-meter barriers with 50% or less porosity, berms or equipment should be located adjacent to roadways or urban areas.
- The bottom of wind fences should be sufficiently anchored to the ground to prevent material from blowing underneath the fence.
- Barriers placed at right angles to prevailing wind currents at intervals of 15 times the barrier height are suggested to be the most effective in controlling wind erosion.
- Windbreaks and fabric fences should be maintained in an upright and functional condition at all times until no longer needed.
- All accumulated material on the windward side of the windbreak should be periodically removed to prevent failure of the windbreak.

Examples of wind fencing include: trees or shrubs left in place during site clearing; sheets of plywood; wind-screen material such as that used around tennis courts; snow fences; hay bales; crate walls; sediment walls; burlap fences; etc. Block walls, if part of the final project, can replace wind fencing during the site construction phase.

6.2.3 Stabilize Surfaces of Completed Earthworks with Vegetation

Surfaces of completed earthworks (including landscaping) should be re-vegetated (i.e., seeded and mulched) within 10 days after active operations have ceased.

Ground cover should be of sufficient density to expose less than 30% of un-stabilized ground within 90 days of planting, and all times thereafter. Such restoration control measure(s) should be maintained and reapplied, if necessary, so that a stabilized surface is formed within 8 months of the initial application. Ground cover should be established prior to final occupancy. The area should be restored such that the vegetative ground cover and soil characteristics are similar to adjacent or nearby undisturbed native conditions (e.g., reseed using native grasses). Care must be taken to avoid introducing or promoting the spread of noxious weeds and plants. Prevent motor vehicle and/or off-road vehicle trespassing, parking, and/or access, by installing barriers, curbs, fences, gates, posts, signs, shrubs, trees or other effective control measures.

Temporary seeding and mulching may be applied to cover bare soil and to prevent wind erosion. The soil must be kept moist to establish cover. Mulch can protect the soil surface until newly seeded vegetation can take over and improves the chance of getting a good grass stand quickly. Some types of mulch require tilling to integrate them into the upper layer of soil, if they are to be effective in dust control. Light mulches such as straw should be tacked in place, either mechanically or by application of a chemical tacking agent. Areas to be reseeded should be mulched as described below:

- Hay mulch – perennial native or introduced grasses of fine-stemmed varieties should be used. At least 65% of the herbage by weight of each bale of hay should be 10 inches long in length or longer. Rotted, brittle or mouldy hay are not acceptable. Hay should be properly cured prior to use. Hay that is brittle, short fibered or improperly cured is not acceptable. Hay mulch should be crosshatched crimped to a minimum depth of two inches.
- Straw mulch – small grain plants such as wheat, barley, rye or oats should not be used. Alfalfa or the stalks of corn, maize or sorghum are not acceptable. Material which is brittle, shorter than 10 inches or which breaks or fragments during the crimping operation are not considered acceptable. Straw mulch should be crosshatched crimped to minimum depth of two inches.
- Gravel mulch –should be a maximum of three quarters to one inch in diameter and must have been crushed or screened with a minimum of one angular face.

It is recommended that existing trees and large shrubs (and other live perennial vegetation) be allowed to remain in place to the greatest extent possible during site grading processes. Perimeter vegetation should be planted early.

6.2.4 Stabilize Surfaces of Completed Earthworks with Stone/Soil/Geotextiles

The following materials may be used to stabilize surfaces, when re-vegetation is not possible (e.g., highly erodible soils):

- Stone (coarse gravel or crushed stone) can be an effective dust deterrent. The sizes of the stone can affect the amount of erosion that takes place. In areas of high wind, small stones are not as effective as large stones (e.g., 8 inches).
- Topsoil uses less erodible soil material placed on top of highly erodible soils.
- Geotextiles can be used on graded sloped surfaces to prevent wind and water erosion.

6.2.5 Create Ridges to Prevent Dust

A disk or other implement may be run on contours of slopes to disturb the soil and leave ridges as well as bring clods of soil to the surface. These ridges deflect and raise wind 5 or 6 inches above the soil surface. Plowing should begin on the windward side of the site using chisel-type plows spaced about 12 inches apart, spring tooth harrows, or similar plows.

6.2.6 Compact Disturbed Soil

Disturbed soil may be compacted with rollers or other similar equipment in order to reduce the erosion potential of the area.

6.2.7 Eliminate Open Burning

Open burning of vegetative waste or other burn materials (e.g., trash, demolition debris, etc.) should not be carried out at the construction site. Open burning is typically prohibited because it can cause air pollution that is harmful to human health and the environment, and endanger property. Waste materials disposed of via open burning typically consist of plastics, other synthetics and chemicals. The low-temperature burning of these materials leads to incomplete combustion and emissions of several toxics. In addition, emissions from open burning are highly concentrated.

Municipalities have preferred management approaches to vegetative waste depending on local circumstances. These can include mulching, firewood, resale for cost recovery, used at waste to energy facilities, etc. Operators should determine local preferences for addressing vegetative waste and ensure that this approach reduces dust generation.

During site clearing, vegetative material may be chipped and then stored for subsequent use as cover material for vehicle access lanes or storage piles.

6.2.8 Where Possible, Reduce Certain Activities During Windy Conditions

During times of windy conditions, where feasible, construction operations that generate greater levels of dust may be avoided or reduced. Instead, these activities can be conducted when more favourable weather conditions occur. Increased application of other dust suppressant techniques may also be considered in times of very windy weather.

6.3 Storage Piles

Several work practices can be employed to mitigate fugitive dust emissions resulting from storage piles. These work practices primarily reduce the exposure of storage piles to wind.

6.3.1 Storage Pile Activities Should be Conducted Downwind

Storage pile activity (i.e., loading and unloading) should be confined to the downwind side of the storage pile. This practice applies to areas around the storage pile as well as the pile itself. Storage piles should also be located away from downwind site boundaries.

6.3.2 Utilize Enclosures/Coverings for Storage Piles

Enclosures or the covering of inactive piles are effective in reducing wind erosion and controlling fugitive dust emissions from storage piles. Enclosures can either fully or partially enclose the source. Examples of enclosures used for reducing fugitive dust emissions from storage piles include:

- three-sided bunkers that are at least as high as the stockpiled materials. The sides' length must be no less than equal to the length of the pile; the sides distance from the pile must be no more than twice the height of the pile; the sides height must be equal to the pile height; and the material of which the sides are made must be no more than 50% porous;
- storage silos (in lieu of open piles). Bulk cement, bentonite and similar fine dry materials (e.g., less than 3 millimetres in particle size) should be stored in silos. Silos should be equipped with particulate matter emission control technology (e.g., fabric filters); and
- open-ended buildings or completely enclosing the pile within a building furnished with particulate matter emission control technology.

Tarpaulins, plastic, or other material can also be used as a temporary covering. When these temporary coverings are used, they should be anchored to prevent the wind from removing them. Small or short-term inactive storage piles should be enclosed or kept under sheeting while larger inactive storage piles should be shrouded, capped or grassed over. For example, turf removed early in the construction project may be re-used to grass over long-term inactive storage piles. It should be noted that enclosures/coverings may not be suitable under certain conditions.

6.3.3 Utilize Wind Fences/Screens for Storage Piles

Porous wind fences/screens provide an area of reduced wind velocity that reduces wind erosion potential and fugitive dust emissions from the exposed surface on the leeward side of the fence/screen. Wind fences/screens reduce the turbulence generated by ambient winds in an area the length of which is many times the physical height of the fence. It should be noted that wind fences/screens may not be suitable under certain conditions.

Wind fences/screens can either be man-made structures (e.g., wind fences, berms, parking construction equipment in a position to block the wind) or vegetative (see below) in nature and are considered to be very cost effective since they incur little or no operating and maintenance costs.

The level of emission reductions achieved with wind fences/screens depends upon the physical dimensions of the fence relative to the source being controlled (e.g., storage pile). The length of the wind fence/screen should be no less than the length of the pile and the height must be equal to or greater than the height of the pile.

A vertically-abrupt barrier will provide large reductions in velocity for relatively short leeward distances, whereas porous barriers provide smaller reductions in velocity but for more extended distances. If complete control is desired, then barriers must be placed at frequent intervals. In addition, the direction of wind influences the size and location of the protected areas. The area of protection is greatest for winds perpendicular to the barrier length and least for winds parallel with the barrier.

A porosity (i.e., percent open area) of 50% achieves optimum results for most applications. The porosity can be achieved by vertical or horizontal slatting or by a mesh structure, as long as the element size is no more that about a fifth of the fence height. Some research has indicated that for a small soil storage piles, a screen length of five times the pile diameter, a screen to pile distance of twice the pile height and a screen height equal to the pile height is optimal.

In addition to storage piles, wind fences/screens can be used to mitigate fugitive dust emissions from a wide variety of other fugitive dust sources (e.g., variety of exposed areas, materials handling operations, etc.). Since fences and screens can be portable, they are therefore capable of being moved around the site, as needed.

6.3.4 Use Vegetation Cover as a Wind Break

Vegetation can be grown on and around storage piles in order to mitigate fugitive dust emissions. Vegetative cover that can act as a windbreak may consist of perennial grass, trees or shrubs in 1 to 10 rows. One, two, three, and five-row barriers of trees are found to be the most effective arrangement for planting to control wind erosion. The type of tree species planted also has considerable influence on the effectiveness of a windbreak. In arid and semiarid regions where rainfall is insufficient to establish vegetative cover, mulching may be used to conserve moisture, prevent surface crusting, reduce runoff and erosion, and help establish vegetation.

Storage piles can also be situated in order to take advantage of existing landscape features and vegetation, which can act as a windbreak.

6.3.5 Properly Shape Storage Piles

Storage piles should be maintained so that they do not have steep sides or faces. In addition, sharp changes of shape in the final storage pile should be avoided. The disturbance of storage piles should also be minimized where feasible.

6.3.6 Properly Schedule the Delivery of Landscaping Materials

Material should not be ordered unless it will be used shortly after delivery. This will minimize storage time and reduce the potential for emissions.

6.4 Material Handling and Transfer Systems

There are many actions that can be employed to mitigate dust emissions resulting from material handling and transfer operations such as crushing, grinding mills, screening operations, bucket elevators, conveyor transfer points, conveyor bagging operations, storage bins, and fine product truck and railcar loading operations.

6.4.1 Control Mud and Dirt Trackout and Carryout

Mud and dirt trackout/carryout from construction sites can account for a temporary but substantial increase in paved road emissions in many areas. Elimination of trackout/carryout can thus significantly reduce paved road emissions. There are several techniques that can be employed to remove material from truck underbodies and tires prior to leaving the site as well as techniques to periodically remove mud/dirt trackout/carryout from paved streets at the access point(s).

6.4.1.1 Street Cleaning

The accumulation of mud, dirt or similar debris that is deposited on paved roads (including shoulders) adjacent to the site should be removed. This cleaning should occur at the end of each workday, or at a minimum of once every 24 hours when operations are occurring. In urban areas, this cleaning should be undertaken immediately if the trackout/carryout extends more than 10 metres (33 feet) onto the paved public road. If the trackout/carryout extends less than 10 metres, clean up should occur at the end of the workday. In addition to public roads that are located outside of the construction site, accumulated mud and dirt should also be frequently removed from the paved interior roads to prevent trackout/carryout onto the paved public roadway.

The recommended street cleaning can be conducted by: manually broom sweeping and picking up material; rotary brush or broom accompanied with or preceded by sufficient wetting; vacuum sweeping; water flushing; and water sweeper. If wet systems are used, the runoff should be controlled so it does not saturate the surface of the adjacent unpaved haul road.

Vehicle waiting areas should also be regularly inspected and kept clean by brushing or vacuum sweeping.

Street sweeping technology should be selected that is most efficient in the use of water while at the same time minimizes dust generation. Since vacuum sweepers are more effective in removing smaller, finer soil particles, they have replaced conventional broom sweepers.

Municipalities often operate street sweeping equipment. These municipalities should coordinate timing, costs and use of the equipment to ensure street clean-up occurs as soon as dust generating activity is completed or during the tracking period.

6.4.1.2 Haul Roads

Paved haul roads or gravel strips should be created early in the project. These haul roads are designed to limit mud and dirt deposits on public paved roads. The paved or gravel haul roads should be maintained at the point of the intersection of a paved public roadway and a work site entrance. Haul roads enable construction vehicles to clean their tires before movement to a more heavily travelled paved public roadway.

When paving, the surface should extend at least 30 meters into the site and be at least 7 meters wide (23 feet wide). Mud and dirt deposits accumulating on paved interior roads should be removed with sufficient frequency, but not less frequently than once per workday, to prevent carryout and trackout onto paved public roads.

When using a gravel bed, washed gravel, rock, crushed rock or other low silt (<5%) content material should be used (minimum size – one inch in diameter, preferably between 1 and 3 inches in diameter) and maintained in a clean condition to a depth of at least six inches and extending at least 7 meters wide and at least 15 meters long and a minimum of 6 inches deep. The gravel bed should cover the full width of the unpaved exit surface. When installing the gravel bed ensure that it is properly graded. The gravel should be re-screened and washed or additional gravel should be applied in order to maintain effectiveness. Any gravel deposited onto a public paved road travel lane or shoulder should be removed at the end of the workday or immediately following the last vehicle using the gravel pad, or at least once every 24 hours, whichever occurs first.

Installation/stabilization of curbing and/or paving of road shoulders can prevent tracking of dirt from construction sites.

6.4.1.3 Trackout Control Devices

There are various trackout control devices that can be installed in order to remove mud, dirt, etc. from truck tires and the undercarriage of motor vehicles and/or haul trucks prior to leaving the work site, for instance a grizzly or a wheel washing system. It should be noted that track-out control devices require environmental management plans to control surface deposition.

A grizzly is also known as a wheel shaker/wheel spreading device and consists of raised dividers (rails, pipe or grates) that are at least three inches tall, at least six inches apart, at least 8 meters long and 3 meters wide. Wheel washers may be adjusted to spray the entire vehicle including bulk-stored material in haul vehicles. Grizzlies and wheel washers should be cleaned/maintained on a regular basis to ensure their effectiveness.

These systems should be installed on all work sites with a disturbed surface area of 3 hectares or more and from all work sites where 75 cubic metres (~100 cubic yards) of bulk materials are hauled on/or off-site per day. All traffic should be routed over the installed trackout control devices.

6.4.1.4 Truck Wash

A truck wash, using hoses and ample water supply, should be installed at access points to remove mud/dirt from vehicles prior to exiting the site. The wheels and the body of each truck can then be cleaned to remove spilled materials after the truck has been loaded and prior to leaving the construction site. Vehicles may be washed prior to each trip. Construction equipment may also be washed at the end of each work day. It should be noted that truck wheel washes require environmental management plans to control surface runoff of wheel wash water.

6.4.1.5 Site Restrictions

Some site restrictions that should be considered to minimize trackout/carryout include the following:

- confine load-in/load-out procedures to leeward (downwind) side of the material;
- designate a single site entrance and exit; and
- ensure that vehicles stay on established traffic routes within the construction site.

6.4.2 Minimize Material Drop at the Transfer Point and Enclosure

When loading materials onto vehicles and conveyors, the drop heights should be kept to a minimum and enclosed whenever possible. Where feasible, transfer points and conveyor belts should be totally enclosed (or conveyor belts are to be equipped with no less than 210 degrees of enclosure) on the top and sides as needed and the collected emissions directed to particulate matter control equipment (i.e., baghouse or similar control device) at all times when the conveyors are in operation. The distance between material transfer points should also be minimized.

Conveyor belts should be equipped with belt wipers and hoppers of proper size to prevent excessive spills. Conveyor belts as well as the ground under conveyors should be periodically cleaned to remove residue material. The speed of the conveyor belt should also be restricted to minimize spills.

6.4.3 Utilize Foam Suppression Systems

Foam systems (combination of water and a chemical surfactant) may be used on material transfer systems to mitigate dust generation. The surfactant, or surface active agent, reduces the surface tension of the water. As a result, the quantity of liquid needed to achieve good control is reduced. The primary advantage of foam systems is that they provide equivalent control at lower moisture addition rates than water spray systems.

Some specific application guidelines for foam systems include the following:

- Foam can be made to contact the aggregate material by any means (high velocity impact is not required);
- Foam should be distributed throughout the product material - inject the foam into free-falling material rather than cover the product with foam; and
- Amount applied should allow all of the foam to dissipate. Presence of foam with the product indicates that either too much foam has been used or it has not been adequately dispersed within the material.

6.4.4 Secure Loads on Haul Trucks

There are several work practices that can be employed to minimize the amount of fugitive dust emissions that occur from the transportation of aggregate material within a construction site.

6.4.4.1 Partial or Total Enclosures

The entire surface area of hauled bulk materials should be covered with an anchored tarp, plastic or other material whether the cargo container is empty or full. Alternatively, completely enclosed trucks can be used. For instance, the transport of fine powdery material should be carried out in closed tankers, while dusty materials and aggregates should be transported in enclosed or sheeted vehicles.

Where feasible, the cargo compartment of haul trucks should be cleaned and/or washed at the delivery site before/after loading or unloading. This practice can be applied judiciously, for instance to specific trucks that appear to be particularly dirty (i.e., not necessary for some trucks that appear to be quite clean).

The cargo compartment of all haul trucks should be constructed and maintained so that spillage and loss of bulk material cannot occur from holes or other openings in the cargo compartment's floor, side and/or tailgate or bottom dump gate. Seals on any openings used to empty the load including, but not limited to, bottom-dump release gates and tailgates should be properly maintained to prevent the loss of bulk material from those areas. Belly-dump truck seals should be checked regularly, with any trapped rocks removed in order to prevent spillage.

6.4.4.2 Freeboard

If feasible, trucks may be loaded such that the freeboard is not less than 7 cm (~3 inches). In other words, trucks may be loaded so that no part of the load that makes contact with any sideboard, side panel or rear part of the load comes within 7 cm (~3 inches) of the top part of the enclosure for bulk materials.

6.4.4.3 Loader Bucket

Aggregate material should be emptied from the loader slowly, keeping the bucket close to the truck while dumping (to minimize drop height).

6.4.5 Prevent PM Emissions from Spills

Spillage of material caused by storage pile load-out and maintenance equipment can significantly increase fugitive dust emissions associated with vehicle traffic. If spillage cannot be prevented due to the intense use of mobile equipment in the storage pile area, then the following work practices should be adhered to:

- Methods and equipment to immediately clean-up accidental spillages of dusty or potentially dusty materials should be readily available. If necessary, use audible and visual alarm systems;
- A vacuum truck should be used to clean up spills of cement powder and similar dusty materials; and
- The material transfer site (as well as the entire construction site) should be regularly inspected for spills. There should be regular removal of spilled material in areas within 100 metres of the storage pile. Consider designating an individual to be responsible for spill response and clean-up as well as reporting requirements.

6.4.6 Minimize Material Handling Operations

The number of material handling operations should be kept to a minimum by ensuring that dusty material is not moved or handled unnecessarily. Process speeds should be minimized in order to reduce fugitive dust emissions.

6.4.7 Capture Fugitive Dust Emissions

Fugitive dust emissions escaping through building openings where material handling operations occur may be controlled by installing a removable filters over appropriate building openings, capturing emissions within the building by a proper hood system and conveying the dust through a duct to particulate collection systems.

6.4.8 Utilize Wind Barriers

Where practical, wind barriers may be installed with a porosity of no less than 50% upwind of screening operations to the height of the drop point.

6.4.9 Where Possible, Reduce Certain Activities During Windy Conditions

During very windy conditions, where feasible, specific material handling/transfer activities that generate greater levels of dust may be avoided or reduced. Instead, these activities can be conducted when more favourable weather conditions occur. Increased application of water or other dust suppression techniques may also be considered, if it is not possible to reschedule activities.

6.5 Road Surfaces

The following work actions can be employed to reduce the potential for fugitive dust emissions from the various road surfaces located within construction sites. Examples of these road surfaces include unpaved roads, haul routes, parking lots, equipment staging areas, etc. An evaluation should be made to determine which road surfaces, if treated, would mitigate the most dust (likely all unpaved surfaces cannot be treated).

6.5.1 Establish On-site Vehicle Restrictions

Vehicle restrictions limit the amount and type (e.g., restriction of roads to certain vehicle types or vehicles under a certain weight) of traffic present on unpaved roads or lowers the mean vehicle speed travelling on the road. For instance, reducing the amount of trips (e.g., by 50%) will reduce the generation of fugitive dust from unpaved road surfaces. General site traffic should also be limited to established haul routes which have been watered or treated and unnecessary vehicle movements and manoeuvring should be avoided. Barriers should be utilized to prevent motor vehicle and/or off-road vehicle trespassing, parking, and/or access, by installing barriers, curbs, fences, gates, posts, signs, shrubs, trees, or other effective control measures.

Construction sites should limit the speed of vehicles travelling on unpaved access/haul roads within construction sites to a maximum of 16-24 kilometres per hour (10-15 miles per hour) and to 10 kilometres per hour (6 miles per hour) on unmade surfaces. Speed limit signs should be posted at each construction site’s uncontrolled unpaved access/haul road entrance. At a minimum, speed limit signs should also be posted at least every 150 meters (500 feet) and should be readable in both directions of travel along uncontrolled unpaved access/haul roads.

6.5.2 Surface Improvements to Unpaved Road Surfaces

Paving of the internal roadway network including roads and parking lots (using recycled asphalt, asphaltic concrete or concrete) early in a project’s development phase will significantly reduce fugitive dust emissions. If an internal roadway network is paved, employees are to be instructed to park only on paved areas. It should be noted that paving internal roadways has significant costs and will only be feasible in certain situations, for instance when work is to be carried out at a site for a significant time-period. Alternatively, the unpaved road can be double chipped and sealed and subsequently maintained on an as needed basis.

If not paved, the road surface should be covered with material that has a low silt content (i.e., less than 5%) to a depth of three or more inches. Examples include gravel, slag, recrushed/recycled asphalt and road carpets. Gravel should be used in areas where paving, chemical stabilization or frequent watering is not feasible. These roads should be gravelled on a regular basis.

Vegetative cover has been suggested as a surface improvement for very low traffic volume roads.

6.5.3 Proper Maintenance of Unpaved Roads

The edges of roads and footpaths should be cleaned regularly, using brooms and damping as necessary. Weekly scraping of roads with a grader may be undertaken to clear off dirt and debris.

6.5.4 Work Practices Associated with De-icing Materials

Some work practices to reduce fugitive dust emissions associated with de-icing operations within construction sites include the following:

- Use of de-icing materials with either a lower initial silt content or greater resistance to forming silt-size particles will result in lower road surface silt loadings and subsequently lower fugitive dust emissions;
- Plow road surfaces instead of sanding;
- Sand and chips remaining from road de-icing should be swept-up and transported to a designated storage area for reuse; and
- Improvements in planning and application techniques limit the amount of de-icing material that has to be applied to roads on a construction site.

6.6 Fabrication Processes

Outlined below are work practices that may be applied to reduce fugitive dust emissions from the various fabrication processes that occur at construction sites. A common work practice to reduce fugitive dust emissions (among many of these fabrication processes) is the use of high efficiency particulate arrestors (HEPA). HEPA filters control fine particulate matter emissions from dry work on concrete such as blasting, crushing, jack-hammering, grinding, boring holes, sandblasting, polishing, and sawing. HEPA filters can capture 95% of silica dust.

Enclosures should also be used whenever possible as they are an effective way to prevent the transport of dust throughout buildings and from buildings to the environment. Wood frame and plastic film enclosures can be designed with negative pressure to ensure that dust does not flow out of the enclosed space. The potential of increased workplace exposure to dust must be considered when utilizing enclosures inside structures.

Ducting systems should be cut-off to prevent the circulation of dust during construction and renovation activities.

Material drop heights for building debris should be minimized whenever possible. When debris is being dropped from high levels, this material should be dropped over several sequential stages instead of the entire distance at once. Chutes that are used to drop materials to the ground level should be enclosed, if feasible. In addition, bins that are used to receive materials should also be covered when not in use.

6.6.1 Cutting, Grinding and Drilling

Work practices to minimize fugitive dust emissions from various cutting, grinding and drilling operations include the following:

- Use prefabricated materials whenever possible, to avoid the necessity of using these processes on the construction site;
- Apply water sprays in conjunction with cutting equipment;
- Avoid cutting out errors and re-bars;
- Always try to fill whenever possible rather than cutting back oversized work;
- Always use dust extraction/minimization systems with angle grinders and disc cutters;
- When cutting roadways, pavements, blocks, etc., a diamond bladed floor saw with water pumped through the system should be used; and
- When raking out mortar/pointing, a mortar raking kit, fitted on to a standard 5 inch (13 centimeter) angle grinder can be used on soft mortar. For hard mortar, a super-saw with oscillating blades can be used.

6.6.1.1 Design Considerations to Avoid Grinding and Cutting

If possible cutting and grinding should be avoided through the design and other techniques, such as:

- Designing tolerances for infilling rather than cutting back oversize work;
- Increasing the size of concrete pours to reduce the need for grinding;
- Use of bonding agents;
- Designing the concrete components themselves to affect interfaces; and
- Using wet grit blasting for outside work.

Should grinding be necessary, PM emissions can be mitigated by: (i) fitting tools with dust bags; (ii) pre-washing work surfaces; (iii) screening off areas to be ground; and (iv) vacuuming up, as opposed to sweeping away, residual dust.

6.6.2 Sand and Grit Blasting and Façade Cleaning

6.6.2.1 Utilize Wet or Other Processes That Minimize Dust Generation

When sand, grit or shot blasting or façade cleaning, wet processes (e.g., high pressure water blasting or water blasting supplemented by abrasives) should be used whenever possible. Wet processes introduce water into the air/grit stream, which reduces dust generation. In addition, it should be ensured that the slurries do not dry out. Spent abrasive materials should be wetted and periodically removed from the job site. Hydroblasting, vacuum blasting and centrifugal wheel blasting are also alternatives that reduce fugitive dust generation vs. dry blasting.

6.6.2.2 Utilize Enclosures

If dry grit blasting is necessary, then curtains, enclosures or shrouds should be erected to completely surround the blasting operation. This includes the area around and underneath the operation. The ground cannot be used as the bottom of the enclosure unless completely covered with plastic sheeting or a tarpaulin. The enclosure should be constructed of flexible material such as tarpaulins or containment screens which are specifically designed for this purpose or for rigid materials such as plywood. All materials should be maintained free of tears, cuts or holes.

All debris which has been collected by this operation or which has fallen to the ground should be collected and subsequently disposed of. Collection and storage should be done as often as needed, but as a minimum, at the end of each workday. Storage should be in steel dumpsters or drums. All containers should include lids that should be secured at the end of each workday.

Dry blasting should be conducted indoors, where possible, with enclosures equipped with emission controls. Negative pressure dust collectors should also be used in conjunction with enclosures and keep doors closed to reduce fugitive dust emissions.

6.6.2.3 Stabilize Particulate Matter in Surrounding Area Following Blasting

Particulate material from the surrounding area should be cleaned up during and following blasting activities. Water or a dust suppressant should be applied to the disturbed soils after blasting as well.

6.6.2.4 Alternative Abrasive Material Should be Used

More durable abrasives with lower dust generation potential should be used, such as non-friable abrasives. The reuse of abrasives containing high quantities of fines and/or toxic compounds should be avoided.

6.6.3 Concrete Cutting

Concrete cutting operations use diamond or abrasive discs for hand-cutting operations and a Vermeer grinder wheel mounted on a construction vehicle for large cutting or trenching operations. The use of water in sufficient quantities to wet the cutter, the immediate surrounding work area, and the fugitive dust immediately emanating from the cutting operation is effective (e.g., use of a wet vacuum system). This work practice also applies to asphalt cutting as well.

Enclosures, curtains or shrouds surrounding the work area that contain the emission of fugitive dust may also be utilized. In this case, the surface dust created should be promptly cleaned from the surface using a wet sweeping process. A vacuum should be used to collect dust when cutting materials.

6.6.4 Mixing Processes

Actions that can be employed to mitigate the generation of PM emissions from mixing operations include the following:

- Utilization of pre-mixed concrete, plasters and masonry compounds will serve to reduce on-site PM emissions generation;
- Use correctly-sized pre-cast sections in order to reduce the need for cutting and drilling on the construction site;
- Enclosed or protected areas should be used to mix concrete or bentonite slurries;
- Fine materials should be palletized and shrink wrapped when possible;
- Keep foundations moist; and
- Use larger pours of concrete rather than repeated small pours.

6.6.5 Internal and External Finishing and Refurbishment

Dust suppression/collection equipment should be attached when using sanding and cutting machinery. In addition, vacuum cleaning should be used whenever possible. When installing fire-proofing or insulation material, dust suppressants should be used when blowing fibres into empty spaces or encapsulated materials should be used instead.

Floor sweeping can generate dust. Inside of homes should be power vacuumed of dust and debris. When cleaning after work has been completed, damp sweeping using fine mist can also be utilized. Dry sweeping should only be utilized with vacuum extraction methods attached. Floor sweeping compounds can also be used where appropriate, or wet sawdust can be used.

6.7 Demolition and Deconstruction

Unique work practices and technologies that can be applied to reduce fugitive dust emissions from demolition and deconstruction activities are outlined below. There are many additional actions that can also be employed, but those common to demolition and construction activities are not repeated within this section. Demolition firms are encouraged to review Section 4 in order to identify additional actions that can be employed to reduce fugitive dust emissions from their operations.

6.7.1 Apply Deconstruction Techniques

Buildings that must be taken down should, to the extent possible, be deconstructed rather than demolished so that materials can be reused in other buildings. Deconstruction generally results in lower fugitive dust emissions compared to demolition.

6.7.2 Minimize Drop Heights for Debris

Material drop heights for building debris should be minimized whenever possible. When debris is being dropped from high levels, this material should be dropped over several sequential stages instead of the entire distance at once.

6.7.3 Enclose Chutes and Cover Bins

Chutes that are used to drop demolished materials to the ground level should be enclosed, if feasible. In addition, bins that are used to receive materials should also be covered when not in use.

6.7.4 Use Fogging Systems

A fogging system can be used to direct fog into the fugitive dust area. If fog droplets and airborne dust mix, dust particles stick to the water droplets thereby adding weight to the dust particles. The increased mass of the dust particles causes them to fall out of the air. Fogging systems can only be used in an area that has a pocket or cover.

6.7.5 Barriers to Prevent Dispersion

Enclosures, curtains or shrouds can be utilized during the demolition phase to confine dust generation. Negative pressure dust collectors can be used to collect the dust that has been confined by the enclosures, etc. Enclosures, curtains or shrouds may be impractical during demolition activities lasting a few days or less.

Prior to blasting, buildings should be screened with suitable debris screens and sheets.

6.7.6 Avoid Blasting When Feasible

Blasting with explosives has the potential to generate large amounts of fugitive dust emissions in a very short period of time. Blasting should be avoided and other demolition and deconstruction methods used wherever possible. It is noted that in some instances, blasting is the safest manner in which to quickly bring down a structure.

Blasting operations can significantly reduce the size of the building and its component materials. The generation of a large amount of fugitive dust in the short term through blasting may reduce the potential for prolonged periods of fugitive dust emissions that would otherwise occur in ongoing size reduction operations.

6.7.7 Vacuum Debris

Vacuums or similar cleaning devices should be used to thoroughly clean blast debris from paved and other surfaces following blasting operations. An industrial vacuum should be used to clean debris prior to the use of high pressure air to blow soil and debris.

6.7.8 Work Practices for Loading Debris

Loaders should tip debris into haulage trucks with a minimum fall distance to minimize dust emissions from tumbling debris. If possible, fine debris should be placed into the truck bin first, followed by larger debris on top. Alternatively, if possible, dry debris should be placed into the truck bin first, followed by wet debris on top. Debris loads should be balanced in truck bins. Debris loads should not be compacted using the impact of a loader bucket.

6.7.9 Avoid Prolonged Storage of Debris

Avoid prolonged storage of debris on site and its exposure to wind.

Waste and refuse bins should be covered when they are being removed from the construction site.

7. Reducing Other Emissions at Construction and Demolition Sites

7.1 Introduction

This chapter of the Best Practices document identifies actions that can reduce emissions from construction and demolition activities, beyond fugitive dust emissions. Three separate emission source categories are addressed in this section of the Best Practices document, specifically:

- Vehicle and equipment engines;
- Hot mix asphalt production at portable plants; and
- Volatile organic compounds (hydrocarbon solvents).

While the focus of this chapter is on emissions other than PM, the section on vehicle and equipment engines identifies actions that can also reduce particulate matter emissions from vehicle and equipment stacks (i.e., not fugitive PM emissions).

7.2 Vehicle and Equipment Engines

Road and heavy engineering construction activities rely on the utilization of a wide range of mobile equipment, such as bulldozers, graders, dump trucks, pavers, excavators, and bobcats. The engine exhaust from these vehicles, especially from those operating on diesel fuel, represent a source of particulate and other emissions (e.g., SO_2, NO_x, VOC, PAH, CO_2) from the construction site. Outlined below are technologies and work practices that can be employed to reduce these emissions. Construction companies are advised to ensure that their warranties on vehicles will not be voided, should they be retrofitted with emission control technologies or use of alternative fuels.

It should be noted that Environment Canada, through the Federal Agenda on Cleaner Vehicles, Engines and Fuels is establishing initiatives, including regulatory measures under the *Canadian Environmental Protection Act, 1999*, that are designed to reduce emissions from the various off-road vehicles and engines that are typically used at road and heavy engineering construction sites. The *Off-Road Compression-Ignition Engine Emission Regulations* introduce emission standards for new diesel engines such as those typically found in construction, mining, farming and forestry machines. The Regulations apply to engines of the 2006 and later model years. In addition, the *Off-Road Small Spark-Ignition Engine Emission Regulations* establish emission standards for small spark-ignition engines rated up to 19 kW (25 hp). Small spark-ignition engines are typically gasoline-fuelled engines found in lawn and garden machines, in light-duty industrial machines (e.g., generator sets, welders, pressure washers, etc.), and in light-duty logging machines. These Regulations apply to 2005 and later model-year engines. Further information can be obtained by visiting Environment Canada's CEPA Environmental Registry website at www.ec.gc.ca/CEPARegistry/regulations or calling the Inquiry Centre at 1-800-668-6767. Note that these Regulations do not set limits for GHG emissions.

7.2.1 Use Diesel Particulate Filters

The use of state-of-the-art catalyzed diesel particulate filters can significantly reduce particulate matter emissions from the exhaust of diesel-powered vehicles or equipment. Particulate traps can come equipped on newly purchased vehicles or can be installed on the existing fleet of diesel-powered vehicles operated by a construction company (i.e., retrofit existing vehicles).

All new diesel-powered vehicles should use state-of-the-art catalyzed diesel particulate filters. All existing vehicles should be evaluated, and wherever technically feasible and cost effective, retrofitted with diesel particulate filters.

Catalyst-based diesel particulate filters use catalyst materials to reduce the temperature at which collected diesel particulate matter oxidizes. The catalyst material can either be directly incorporated into the filter system, or can be added to the fuel as a fuel-borne catalyst (see below). Catalyst-based diesel particulate filters can be used with diesel fuels of varying sulphur content. However, very low sulphur fuel (i.e., no more than 15 mg/kg) should be used with vehicles equipped with these filters in order to achieve optimal emission reduction results.

7.2.2 Use Fuel-Borne Catalysts

Fuel-borne catalysts may be used to reduce the emissions of PM, NO_x, VOC and carbon monoxide from off-road diesel-fueled engines. These products typically contain an in-line solid metal oxidation/fuel modification catalyst that changes the composition of diesel fuel immediately prior to its use in an engine. Subsequent combustion of the modified fuel results in a reduction of both the elemental carbon and soluble organic fraction of diesel particulate matter, as compared to untreated fuel.

Another version of this technology is a concentrated liquid fuel-borne catalyst containing 4 to 8 parts per million of fuel-soluble platinum and cerium metal that reduces diesel particulate matter emissions from diesel-fueled engines. The fuel-borne catalyst catalyzes the rate of soot oxidation and lowers the temperature at which soot oxidation takes place.

7.2.3 Use Diesel Oxidation Catalysts

A diesel oxidation catalyst uses a catalytic substance (such as platinum or palladium) to accelerate chemical reactions. When exhaust gases contact the catalyst, the residual hydrocarbons and carbon monoxide are oxidized. The hydrocarbon oxidation also extends to such materials as polycyclic aromatic hydrocarbons (PAH) and the soluble organic fraction of diesel particulates. Diesel oxidation catalysts should be used by construction companies to reduce emissions associated with their diesel-powered vehicles.

The sulphur content of diesel fuel is critical for the performance of diesel oxidation catalysts. The catalyst used to oxidize the soluble organic fraction can also oxidize sulphur dioxide to form sulphate particulate, which is measured as part of particulate matter. Active diesel oxidation catalysts can also oxidize nitric oxide to from nitrogen dioxide. Catalysts have been developed that selectively oxidize the soluble organic fraction, carbon monoxide and PAH, while minimizing the oxidation of sulphur dioxide and nitric oxide. In general, diesel fuel with a sulphur content of 500 mg/kg by weight or less is recommended for any retrofit program.

7.2.4 Ensure Catalytic Converters are Operating Efficiently

Catalytic converters are used in gasoline-powered engines to reduce emissions (e.g., carbon monoxide, nitrogen oxides, volatile organic compounds) associated with vehicle operation. A catalytic converter changes these gases to carbon dioxide, nitrogen, oxygen, and water. Construction operations should ensure that the most advanced catalytic converters are installed on their gasoline-powered vehicles and that these converters are operating to their maximum efficiency.

Practices that serve to reduce the effectiveness of catalytic converters on gasoline-powered construction vehicles should be avoided. For instance, some engine oil additives or engine problems that cause the mixture or the temperature of the exhaust gases to change reduce the effectiveness and life of the catalytic converter. For instance, the over-use of fuel additives can shorten the life of a catalytic converter considerably. Gasket sealers and cements can also poison a converter. In addition, any time an engine is operating outside proper specifications, unnecessary wear and damage may be caused to the catalytic converter as well as the engine itself.

7.2.5 Evaluate Alternative Technologies to Reduce Emissions from Vehicle Engines

There are various emission control technologies at various stages of commercialization, a few of which are described below. These or others should be evaluated for utilization on construction vehicles.

- Selective catalytic reduction (SCR) technology was developed to mitigate NO_x emissions from stationary sources. Recently, SCR technology has been applied to selected large mobile sources. A chemical agent (ammonia or urea) is injected upstream of the SCR catalyst. It reacts with NO_x, reducing it to harmless products. SCR can also provide reductions in particulate matter and volatile organic compound emissions.

- Exhaust gas recirculation routes a portion of the exhaust to the charger inlet or intake manifold. In most systems, an intercooler lowers the temperature of the recirculated gas. The cooled recirculated gas, which has a higher heat capacity than air and contains less oxygen, lowers the combustion temperature in the engine and reduces NO_x formation.
- Lean NO_x catalysts introduce a small amount of diesel fuel into the exhaust stream. This diesel fuel acts as a reducing agent for the catalytic conversion of NO_x to nitrogen. The catalytic substrate is usually a porous material, often made up of zeolite, which provides microscopic sites for fuel (hydrocarbon rich) to react and reduce potential NO_x emissions.

7.2.6 Properly Maintain Engines and Exhaust Systems

Vehicle and equipment engines should be properly maintained to reduce exhaust emissions of CO, VOCs, and PM. Equipment that is in good condition will also reduce fuel consumption. Equipment should be inspected prior to the start of a project. While equipment is on site, a daily inspection should be conducted and parts and hoses showing signs of wear should be promptly replaced. Damaged parts should also be repaired or replaced.

Contractors should be asked to provide maintenance records for their fleet as part of the contract bid and at regular intervals throughout the life of the contract.

7.2.7 Use Low Sulphur Diesel

The sulphur content in off-road diesel is not currently regulated at the national level in Canada. However, voluntary standards set a 5,000 mg/kg specification for sulphur in off-road diesel. The U.S. Environmental Protection Agency finalized an off-road regulation that will limit the level of sulphur in off-road diesel fuel to 500 mg/kg starting in 2007, reduced to 15 mg/kg in 2010. Environment Canada has proposed the *Amendment to the Sulphur in Diesel Fuel Regulations* in October, 2004 to control the level of sulphur in off-road diesel fuel, in alignment with the proposed U.S. standards. Further information on the proposed regulations can be obtained by visiting Environment Canada's CEPA Environmental Registry website: **www.ec.gc.ca/CEPARegistry/regulations**.

It should also be noted that the California Air Resources Board presently has a limit of 500 mg/kg for off-road diesel reduced to 15 mg/kg limit starting in 2006. In addition, the City of Montreal prohibits the use of diesel fuel that has sulphur content in excess of 500 mg/kg for all engines and vehicles.

Low sulphur fuels can improve air quality in two distinct ways: (i) by reducing vehicle emissions of SO_2 and PM due to lower sulphur levels; and (ii) by increasing the effectiveness of existing emission control devices and enabling the use of more advanced emission control devices.

Off-road diesel fuel currently contains a sulphur content of approximately 1,000-3,000 mg/kg in Canada. Diesel fuel with much lower sulphur levels is currently available in Canada. For instance, the current Sulphur in Diesel Fuel Regulations requires that the concentration of sulphur in diesel fuel produced or imported for use in on-road vehicles not exceed 500 mg/kg until May 31, 2006; and 15 ppm after May 31, 2006. Therefore, construction companies are encouraged to use the low sulphur diesel fuel that has been primarily produced for on-road vehicles. A Low Sulphur Fuels Procurement Guide available to aid in the purchase of low sulphur diesel fuel is available at:
www.ec.gc.ca/energ/ecology/LSF/ecological_measures_e.cfm

7.2.8 Alternative Fuels Should be Utilized Where Feasible

There are several alternative fuels that should be used to reduce the level of emissions that otherwise would have occurred with the use of diesel fuel (or gasoline). Alternative fuels that could be used include biodiesel, ethanol, propane, natural gas and various fuel additives. Electricity can also be used, primarily for equipment purposes, however also for vehicles. Biodiesel is described in greater detail below.

Biodiesel can be used in pure form or it can be mixed with diesel fuel (e.g., B20, which is a mixture of 20% biodiesel and 80% standard diesel). Biodiesel reduces the carbonaceous fraction of diesel particulate matter through improved in-cylinder combustion, which is primarily attributed to biodiesel's high oxygen content. B20 can be used without changes to diesel engines or the fuel distribution infrastructure. However, the use of pure biodiesel may require changing some engine seals and fuel lines in older engines. Biodiesel generally contains no sulphur or aromatics, however it may increase NO_x emissions by 5-10%.

7.2.9 Reduce or Eliminate Idling Time

Idling of off-road vehicles on construction sites is often practised for the following reasons:

- to provide heat or air conditioning for the vehicle;
- to keep the fuel and engine warm in cold weather to avoid cold starting;
- while being actively operated such as when waiting to load and unload commodities; and
- trucks and truck-trailer combinations may need to idle in order to operate auxiliary equipment, including power take-off (PTO) equipment.

The reduction of idling provides benefits (besides environmental) in terms of reduced fuel consumption and engine wear and consequently the saving of money to the owner/operator. The idling of off-road engines when the vehicle is not moving, or when the off-road equipment is not performing work, should be limited to less than 5 minutes at any one location. Construction companies are encouraged to institute an anti-idling campaign. Additional details can be located at http://oee.nrcan.gc.ca/idling/home.cfm.

Technologies are available which automatically shut the engine off after a preset time. These idling control technologies should be used where economical. The installation of such systems on construction vehicles avoids the reliance on the operators to comply with a time limitation. Additional details on alternatives to truck idling can be located at:
http://www.ctre.iastate.edu/pubs/truck_idling/index.htm

The City of Toronto has a by-law not allowed vehicles to idle for more than three minutes in a sixty-minute period.

7.2.10 Evaluate Alternatives for Heat and Air Conditioning for Off-Road Vehicles

There are technology-based alternatives to the provision of heat/air conditioning through idling. Examples of available technologies include auxiliary power systems or main engines and on-board electrification. The purpose of these alternative technologies is to displace the use of the higher polluting main engine for providing power and comfort to the cab. These systems are typically used by on-road tractor trailers, however there may be opportunities now or in the future for utilization within construction vehicles.

An auxiliary power system typically consists of an engine and compressor to supply electrical power and climate control to the truck cab. The unit is generally installed in place of one fuel tank and weighs approximately 140 kilograms. There are several methods to power an auxiliary power system including diesel fuel and electrical power. Several heavy-duty diesel engine manufacturers are developing integrated auxiliary power systems for their engines that will be available as an OEM option. Auxiliary power systems are designed as self-contained units that require no external power source other than fuel.

On-board electrification is an alternative to provide the power for HVAC climate control and to power ancillary devices. A simple outlet on the perimeter of the truck space typically supplies the 110-volt or 220-volt power. In order to use on-board electrification for climate control, the purchase of additional equipment may be needed. It should be noted that there are systems that can be powered alone by 110-volt power such as a space heater or small cooler but there are questions as to the practicality of such devices for this use.

7.2.11 Minimize Cold Starts

Both the combustion efficiency of the engine and the effectiveness of the emission control device are at a minimum during a cold start and therefore emissions tend to be high. In order to correct this problem, engine block heaters and pre-heated catalytic converters (using an electrical heat source) may be retrofitted onto engines for more efficient combustion and more complete oxidation of the exhaust in the catalytic converters.

Note that minimizing cold starts does not mean increasing idling times.

7.2.12 Evaporative Losses Should be Minimized

Evaporative losses from construction equipment are primarily associated with the fuel tanks. There are evaporative emission control technologies that can reduce such emissions by as much as 96%. These technologies include: (i) the closed fuel system (modified tank); (ii) tank ventilation to carbon canisters; and (iii) tank filled with expanded metal mesh. These technologies can be retrofitted to the existing fleet of construction vehicles as well as installed on new vehicles.

7.3 Hot Mix Asphalt Production at Portable Plants

The Canadian Construction Association has recently published *Environmental Best Practices Guide for Hot Mix Asphalt Plants*, which details various work practices and technologies that should be employed to minimize emissions of particulate matter, gaseous emissions, odour, and noise. This document should be consulted for additional details on practices that can be employed to minimize the environmental impact of portable hot mix asphalt plants.

The focus of this section is on work practices to reduce gaseous emissions from portable hot mix asphalt plants (work practices to reduce particulate matter emissions were discussed in Chapter 6). These gaseous emissions occur from the combustion process employed at portable hot mix asphalt plants, which is used to dry aggregate prior to it being mixed with asphalt. Gaseous emissions include sulphur oxides, nitrogen oxides, carbon monoxide and volatile organic compounds. The various work practices outlined below have been summarized from the document published by the Canadian Construction Association. For more extensive and detailed information, this document should be reviewed. It should be noted that recommendations are provided later in this Best Practices document concerning actions to mitigate emissions from hot mix asphalt operations at construction sites.

7.3.1 Maintain Proper Air to Fuel Ratio in the Combustion System

The proper air to fuel ratio in the combustion system should be maintained in order to completely and efficiently burn the fuel provided. Incomplete burning of fuel results in higher levels of carbon monoxide and volatile organic compounds.

7.3.2 Burner and Air Systems Should be Regularly Inspected and Maintained

The burner and air systems should be regularly inspected and maintained in order to ensure that fuel consumption is reduced and carbon monoxide and volatile organic compound emissions are minimized. Qualified personnel should perform tune-ups or repairs to the burner system as necessary and a tune-up should be conducted annually to ensure efficiency. The following inspections of the burner system are recommended to ensure that these parts are functioning according to manufacturer's specifications:

- all burner valves and linkages;
- fuel pressure, air-fuel ratios, and combustion air pressure;
- all moving parts are lubricated;
- all filter systems and stainers are regularly maintained;
- nozzles are clear of foreign materials; and
- blowers.

Leaking air directly affects the air to fuel ratio, thereby resulting in inefficient combustion and higher emissions. Therefore, drum and duct air seal points (i.e., the air systems) should be regularly inspected and maintained. Air leaks furthest from the burner result in the most negative impacts on the combustion process.

7.3.3 Conduct Regular Inspections of Other Equipment

Other equipment within portable hot mix asphalt plants (apart from the burner and air systems) should be regularly inspected and maintained to ensure that the combustion process operates to its maximum efficiency. Regular inspections of the following equipment should be conducted to ensure that it is operating properly and to manufacturer's specifications:

- damper - key component in controlling the fuel to air ratio;
- dryer flights - proper veiling of aggregate enables the burner system to work at optimum levels;
- primary and secondary collectors - for material build-up that may reduce the flow of air throughout the system; and
- hot oil heater systems – ensure that hot oil heater burner systems are clean and hot oil heater lines are working properly. The hot oil heater should be tested annually to ensure oxidation is not taking place.

7.3.4 Aggregate Should Not be Allowed to Pass Through Combustion Zone

Aggregate should never be allowed to veil or pass through the combustion zone of the burner's flame. If this occurs incomplete combustion will result, leading to increased carbon monoxide and volatile organic compound (VOC) emissions.

7.3.5 Thermocouples and Other Sensors Should be Regularly Calibrated

Thermocouples and other sensors are installed to monitor temperature and pressure change within the burner system. Thermocouples and other sensors should be regularly calibrated to ensure that they are functioning at their optimum levels.

7.3.6 Low Sulphur Fuels Should be Used

Low sulphur fuels should be utilized to the extent possible in portable hot mix asphalt plants in order to reduce SO_2 emissions (as well as particulate matter emissions).

7.4 Volatile Organic Compounds

Volatile organic compounds (VOCs) are primarily emitted from the construction and demolition sector through the following sources: (i) architectural surface coatings; (ii) traffic marking operations; (iii) asphalt concrete paving; and (iv) asphalt roofing kettles. Outlined below are the various work practices that should be employed in order to reduce VOC emissions from these sources.

7.4.1 Architectural Surface Coatings

Architectural surface coating operations consist of applying a thin layer of coating such as paint, paint primer, varnish or lacquer to architectural surfaces. Architectural surface coatings are applied to a variety of surfaces (e.g., metal, wood, plastic, concrete, bricks and plaster). VOCs that are used as solvents in coatings are emitted during the application of the coating as well as when the coating dries. The amount of coating used and the VOC content of the coating are the primary factors that determine emissions from this source. Solvents are also used as thinners in the coatings and for cleanup activities.

7.4.1.1 Durable and High Performance Coatings with a Low VOC Content Should be Used

Coatings having a low VOC content and meeting established performance standards should be used. Information on VOC contents of coatings purchased for use in construction operations should be requested from suppliers and if unavailable, from manufacturers. Currently, Canada has no requirement for labelling of VOC content of coatings. All manufacturers provide material safety data sheets (MSDSs) for their coatings products and some of these MSDSs provide VOC content information. Some manufacturers also provide technical data sheets for their products and some of these also provide VOC content information. The best source of this information is the website of a coatings manufacturer.

Environment Canada is currently examining potential VOC limits on Architectural and Industrial Maintenance (AIM) coatings, following recent initiatives on AIM coatings by the U.S. EPA, the California Air Resources Board (CARB) and the Ozone Transport Commission (OTC, which represents 12 northeast States). The proposed Environment Canada regulations will be developed through the regulatory process throughout 2005.

Outlined in the Table below are the VOC content limits, established in various jurisdictions in the U.S., for coatings that are commonly used in the construction sector. The environmental certification criteria included in these programs are the requirement to meet specific VOC content limits for flat paint, non-flat paint, stains and varnish. These content limits can be used as a guide to select low VOC coatings until the Environment Canada regulation limiting VOC content has been established and is in force in Canada.

Table 7: Comparison of VOC Content Limits for Coatings Used in the Construction Sector

(grams of solvent/litre of paint, excluding water)

Coatings Category	EPA	SCAQMD	CARB	OTC
Flat Coatings	250	100 (50 by Jul/08)	100	100
Non-flat Coatings	380	150 (50 by Jul/06)	150	150
Floor Coatings	400	100 (50 by Jul/06)	250	250
Industrial Maintenance Coatings	450	250 (100 by Jul/06)	250	340
Lacquers & Sealers	680	550 (275 by Jul/06)	550-680	550-680

Note: EPA – U.S. Environmental Protection Agency; SCAQMD – South Coast Air Quality Management District (California); CARB – California Air Resources Board; OTC – Ozone Transport Commission.

A national guideline for surface coatings is published by the Environmental Choice^{M} Program (ECP). The ECP uses the EcoLogo^{M} to label coatings products that qualify under its environmental certification criteria. Further information on the Environmental Choice Program can be found at: [http://www.environmentalchoice.com].

The Canadian Council of Ministers of the Environment has also published the following document, “Recommendations for CCME Standards and Guidelines for the Reduction of VOC Emissions from Canadian Industrial Maintenance Coatings”.

In addition, the Masters Painters Institute publishes an approved products list for architectural coatings. The list is published twice a year in booklet form and can be accessed at [http://www.paintinfo.com/mpi/]. Information is currently being developed on low odour/low VOC coatings.

It should be noted that durability and performance are critical factors in selecting coatings and have an impact on the lifecycle VOC emissions. A more durable product with a higher performance will reduce the frequency of recoating, thereby reducing VOC emissions. As an example, a coating system with 20% higher VOC content than an alternative product can reduce the number of times an object has to be repainted, thereby actually lowering lifecycle VOC emissions. Also when comparing product VOC content, the total amount of product to be applied has to be taken into consideration. For example, if a coating has a low VOC content, but requires numerous applications, it can result in higher lifecycle VOC emissions than an alternative higher VOC content coating.

7.4.1.2 VOC Emissions from the Storage, Handling and Preparation of Coatings Should be Minimized

Work practices that will reduce VOC emissions from the storage, handling and preparation of coatings are primarily focused on minimizing the duration of exposure of the liquid coating surface to surrounding air, and include the following:

- all coatings containers should be tightly sealed during transportation and storage;
- a new container of paint should not be opened if one is open already;
- containers should be kept covered when not in use (to avoid excessive evaporation from convection air movement);
- a small amount of solvent should be added to empty containers (establish agreement with the supplier) prior to their return to suppliers in order to prevent the drying of paint on the inside walls. This will ensure that only a minimum quantity of cleaning solvent is used in the drum cleaning operation;
- coatings should be mixed in bulk prior to transfer rather than in smaller containers. If small containers are used, then they should be full in order to reduce the number of mixing operations that must be undertaken;
- thinners should be added to coatings just prior to application in order to avoid long dwell times;
- coatings should be thinned with water or VOC-exempt compounds, where possible;

- always mix thinner with the coating according to the manufacturer's instructions; and
- mixing operations should be undertaken to minimize the exposure of the coating to air (e.g., in sealed containers).

Some coatings manufacturers provide technical data sheets that include important information about the proper preparation and application conditions for their products. This information should be reviewed when preparing a coatings management plan and communicated to coatings applicators.

7.4.1.3 Coatings Wastage Through Spillage and Splashing Should be Minimized

Handling procedures should be designed to minimize coatings wastage through reduced spillage and splashing, for instance by adhering to the following:

- During transfers, container lids, bungs, plugs, or valves may be opened or removed, but should be replaced or closed immediately after the transfer is complete;
- If it is necessary to open coating containers for prolonged periods, the use of flexible coverings (e.g., plastic film or sheet, fabric cloth) to cover the surface of the coating should be considered to minimize VOC losses;
- During transfers of coatings from one container to another, a pump and hose system should be used where possible to minimize fugitive VOC emissions. Vent holes in the source container should be opened to prevent the creation of a vacuum that might prevent adequate drainage and potentially lead to an unexpected large spillage;
- If manual decanting from one container to another must be done, it should be performed slowly and carefully to minimize spillage and splashing; and
- Where possible, separate pumping systems should be used for different paint colours to minimize flushing requirements. If this is not possible, colour applications should be sequenced to minimize flushing.

7.4.1.4 Surface to be Coated Should be Properly Prepared

Well-prepared surfaces will not need an excessive volume of coatings. Proper surface preparation can include: (i) removal of undesirable material from the substrate; (ii) sealing of cracks and fissures; and (iii) sanding to achieve desirable roughness for proper coating adhesion. Surfaces to be coated should be prepared as per the coating manufacturers specifications. All dirt, rust, scale, splinters, loose particles, disintegrated paint, grease, oil, and other substances should be removed from all surfaces that are to be painted or otherwise finished. Surface cracks or fissures should be filled with appropriate solid materials (putty, joint compounds), sealers or primers to minimize spaces where coatings can accumulate.

7.4.1.5 Paint Heaters Should be Used Instead of Paint Thinners

Paint heaters should be used to heat coatings to reduce viscosity immediately before spraying. Paint heaters use an in-line heating element located just upstream of the spray gun. The use of paint heaters provides the necessary viscosity to the coating operation, without the use of solvent-based thinners. It should be noted that the use of paint heaters is not always applicable. For instance, the application of heated paint to cold surfaces in winter months results in poor paint surface characteristics (i.e., cracking) because of the rapid cooling of the hot paint after it is applied to the cold surface.

7.4.1.6 Technologically Advanced Spray-Guns Should be Utilized to Apply Coatings

The most technologically advanced spray-guns should be utilized in order to apply coatings. VOC emissions can be significantly reduced by utilizing the most efficient spray guns with the highest transfer efficiency. Transfer efficiency is defined as the ratio of paint that adheres to the surface of the product to the total amount of paint that leaves the gun's nozzle.

Conventional high-pressure spray guns operate between 30 and 90 psi. The transfer efficiency of these high-pressure spray guns is poor. The high pressures associated with these spray guns force paint out of the nozzle at high velocities. When paint particles leave the nozzle at high velocities, they tend to bounce off the targeted surface. If these guns have to be used, the air pressure on these systems should be lowered.

High volume/low pressure spray, low pressure/low volume and airless spray techniques are more recent developments with much higher transfer efficiency than conventional high-pressure spray guns. High-Volume/Low-Pressure (HVLP) and Low-Pressure/Low-Volume (LPLV) spray guns operate at or below 10 psi. The lower pressure ensures that paint particles leave the nozzle at slower velocities than typical spray guns, resulting in a reduction in overspray of up to 50%. Airless spray guns provide high transfer efficiency when applying thick materials. Some companies can reduce thinning of coating as well by using airless spray guns.

7.4.1.7 Spray-Gun Operators Should Apply Correct Application Techniques

Significant reductions in wasted coatings and consequently VOC emissions can result from implementing proper application techniques by operators. The following application techniques should be adhered to:

- The distance of the spray gun from the surface should be consistent. If the gun is too close to the surface, the coating will be applied to heavily and run and sag. If the gun is too far from the surface, excessive overspray, dry spray, a sandy finish and low transfer efficiency will result. HVLP spray guns should be held 15 to 20 cm (6 to 8 inches) away from the surface being coated. Air assisted spray guns should be held 20 to 25 cm (8 to 10 inches) away (20 to 30 cm or 8 to 12 inches if it is electrostatic, air-assisted airless). Airless spray guns should be held 30 to 26 cm (12 to 14 inches) away;
- The speed of the gun as it is moved across the surface should be consistent. A steady gun speed will help obtain a uniform thickness of coating. A gun speed higher than manufacturer specifications can distort the spray pattern and not permit the maximum amount of material to reach the surface;
- The proper overlap of the spray pattern should be applied. This overlap is determined by the coating being applied. Proper overlap may range from 50-80%. Greater overlap may result in wasted strokes, and less overlap may result in streaks;
- The spray gun should be held perpendicular to the surface being coated. Arcing the gun for hard to reach areas results in wasted material, since an uneven coat is applied. These areas should be coated by changing the position of the gun or the operator. Some coatings are applied to irregular surfaces (e.g., staircase banisters, decorative molding) for which the coating transfer efficiency using spray equipment is quite low. For irregular surfaces, manual application methods should be used to increase transfer efficiency;
- The manufacturers recommended system settings should be used for air and fluid pressure and coating consistency. These parameters can then be adjusted through a trial and error process; and
- VOC emissions can also be reduced by avoiding excessive application of topcoats. Primers should be applied as per manufacturers recommendations in order to minimize the quantity of topcoat that has to be applied. Application of topcoats should respect manufacturers recommended coverage rates and application thickness (wet-film thickness & dry-film thickness in mils).

7.4.1.8 Proper Technique Should be Used When Cleaning Spray Guns

For equipment that requires solvent cleaning, methods that reduce evaporation should be implemented wherever practical, for instance through the use of a gun washer to clean spray guns. A gun washer is similar to a dishwasher in that it is designed to hold a number of spray guns and related equipment and cleans by circulating solvent inside a closed chamber. Gun washers result in extended solvent cleaning life, reduced solvent waste and reduced VOC emissions from evaporation. The spent solvent from the gun washer can be reused for additional cleanings. Once the solvent has been reused to the point that it is no longer effective for cleaning the gun, it can be sent to a solvent reclaimer.

Keeping the spray gun clean maintains the gun's efficiency and reduces the risk of poor results due to clogged tips or passages or foreign matter contamination. Proper and regular maintenance of spray guns will also serve to mitigate VOC emissions. The following practices should be adhered to:

- Clean the spray gun regularly to ensure optimum atomization and spray pattern;
- Clean equipment as specified by the manufacturer; and
- Disassemble and inspect spray guns regularly.

Another cleaning practice where VOC emissions can be reduced through special equipment is line cleaning. One method that can improve line cleaning efficiency is to introduce turbulence into the solvent going through the line during cleaning. Equipment that forces alternating pulses of solvent and compressed air is one way to accomplish this.

In addition, lines should never be cleaned by spraying VOCs into the air or into filters. Clean-up solvents should always be directed using minimal pressure into containers. Solvents should be drawn from a closed supply solvent container and discharged into a closed container with an opening only large enough to accommodate the tip of a spray gun. In addition, the spray gun pressure should be lowered (decreasing air and paint pressure) to minimize atomization of the solvent during cleaning.

7.4.1.9 Alternative Coating Application Techniques Should be Used

Where feasible, rollers or brushes should be used instead of spray guns in order to reduce the quantity of solvent-based paint thinners that are required. In addition, transfer efficiency for direct application methods (i.e., rollers, brushes) can approach 100%.

7.4.1.10 Alternative Cleaners or Low-VOC Cleaners Should be Used Instead of Solvents

Where possible, non-VOC or low-VOC cleaning agents should be used instead of solvents. For surface preparation as well as clean-up operations, alternative cleaning agents to solvents (e.g., aqueous surfactant solutions) should be used.

7.4.1.11 Solvents Used for Cleaning Should be Minimized

When cleaning products containing VOCs are used, the following work practices should be applied in order to reduce the amount that has to be used:

- Solvents with a low vapour pressure (flash point greater than 60°C) should be used. The use of common mineral spirits that typically have a 40°C flash point should be avoided;
- A standard should be established to assure that used solvent is disposed of or recycled only when it loses its cleaning effectiveness, not just because it looks dirty;
- The amount of cleaning agent to be used should be minimized by blowing as much old paint as possible back through the lines with compressed air (or by scraping the paint off the surface);
- Pre-determined and measured amounts of solvent should be used (i.e., know how much is to be used beforehand);
- When soaking is required, containers with air tight lids should be used;
- Used solvents should be returned to sealed containers of a waste collection system for recycling and re-use;
- Cleaners should be contained (i.e., covered) and tightly sealed) whenever feasible in order to reduce evaporative losses.
- Solvent-soaked rags should be disposed of in a covered container;
- Segregate cleanup solvents and recover/reuse them;
- Self-closing funnels on barrels and hoses for solvent transfer should be used;
- The spray gun should be emptied of paint prior to cleaning so that the gun system is completely dry; and
- Equipment should be cleaned promptly after use in order to prevent the drying of coatings and consequently the need to use additional solvents in the cleaning operation.

7.4.1.12 Paint Colour Changes Should be Optimized to Reduce the Use of Cleaning Solvents

The amount of cleaning with solvents can be reduced through various strategic operating practices, for instance:

- specific equipment should be assigned to handle specific paint types and colours;
- paint colour changes should be scheduled from light to dark;
- no more coating than necessary should be mixed to complete the work; and
- mixing and application equipment should be dedicated to commonly used coatings.

7.4.1.13 Alternative Finishing Practices Should be Used

Non-VOC surface coverings (walls, floors, ceilings) should be used whenever economical and feasible.

7.4.2 Traffic Marking Operations

Traffic marking operations include the marking of highway centre lines, edge stripes, directional markings and parking lots. The Canadian Council of Ministers of the Environment, in its publication, *Recommendations for CCME Standards and Guidelines for the Reduction of VOC Emissions from Canadian Industrial Maintenance Coatings,* discusses traffic markings.

The following painting materials, typically used for traffic marking, emit VOCs:

- Non-aerosol traffic paint;
- Aerosol marking paint – paints used to apply stripes or markings to outdoor surfaces, such as streets, golf courses, athletic fields, etc.; and
- Preformed tapes applied with adhesive primer.

Alternatives to solvent-based traffic paints are water-based paints, thermoplastics, preformed tapes, field-reacted systems and permanent markers. Some of these alternatives (e.g., water-based traffic paints) can be used in the summer months to avoid the use of VOCs during the time of the year when ground level ozone forms. In addition, consideration should be given to refraining from traffic line painting completely when smog alerts have been issued in the area.

Many of the work practices outlined above for architectural surface coatings can also be applied to traffic marking operations.

7.4.3 Asphalt Concrete Paving

There are three categories of asphalt concrete, specifically: (i) hot-mix; (ii) cutback; and (iii) emulsified. Hot mix asphalt is a mixture of aggregate (rock) and asphalt cement (glue) that can be customized to specific paving applications. Cutback asphalt is made by adding petroleum distillates (e.g., naphtha, kerosene, etc) to asphalt cement. As a result, cutback asphalt contains the highest diluent content of the three asphalt categories and consequently emits the highest levels of VOCs per tonne used. The primary use of cutback asphalt is in tack and seal operations (related to the repair of roads) and for preparing roads for the application of hot-mix asphalt. Emulsified asphalt is made by adding water and an emulsifying agent (such as soap) to asphalt concrete. Emulsified asphalt is used in most of the same applications as cutback asphalt, but emits less VOCs.

7.4.3.1 Use of Cutback Asphalts Should be Minimized

Several jurisdictions in North America have completely or partially banned the use of cutback asphalts, since they result in high levels of VOC emissions. There are three classes of cutback asphalts: (i) rapid cure; (ii) medium cure; and (iii) slow cure. Where possible, rapid cure and medium cure cutback asphalts should not be used. Slow cure cutback asphalts containing more than 0.5% by volume organic compounds that evaporate at 260°C or lower should also not be used, where feasible.

7.4.3.2 Use of Emulsified Asphalt Should be Restricted

Emulsified asphalts that contain organic compounds in excess of 3% by volume which evaporate at 260°C or lower should not be used for paving, road construction or road maintenance.

7.4.3.3 Temperature of Asphalt Operations Should be Monitored and Controlled

VOC emissions from the storage, mixing and application of asphalt cement double for every increase of approximately 11°C (above 125°C) in operating temperature of the asphalt cement. Operating temperatures should be closely monitored and minimized to the extent possible in order to reduce the potential for VOC emissions.

7.4.4 Asphalt Roofing Kettles

VOCs are emitted from the installation and repair of asphalt roofs on commercial and industrial buildings, specifically from roofing kettles. Roofing kettles are used for melting, heating, or holding asphalt or coal tar pitch.

7.4.4.1 Temperature of Material Inside Roofing Kettle Should be Restricted

The temperature of material inside a roofing kettle should be limited to the following in order to reduce the generation of VOC emissions:

• Asphalt	260°C
• Coal tar pitch	200°C

Devices capable of correctly indicating and controlling the operating temperatures of roofing kettles should be properly installed and maintained in good working order.

7.4.4.2 Close Fitting Lids on Roofing Kettles Should be Used

During roofing kettle draining operations, the VOC vapours from the kettle should be contained by a close fitting lid. A close fitting lid is a VOC impermeable cover that fits securely over a roofing kettle or other container so that no gap greater than 1 cm (3/8 inch) exists between the kettle body and lid. The lid(s) should not be opened except for loading the kettle with solid roofing material or unless the material in the roofing kettle is less than 65°C.

Within 2 minutes after the draining operation has been completed, the vessel that received the hot roofing material should be covered with a close fitting lid or capped to prevent the release of visible smoke from the vessel.

7.4.4.3 Kettle Vent Should be Kept Closed

Any kettle vent should remain closed during a pressure release caused by flashing of the roofing material.

7.4.4.4 All Roofing Kettles Should be Equipped with Afterburners

If feasible, roofing kettles should be equipped with afterburner lids, which virtually eliminate VOC emissions from this source. Existing roofing kettles can be retrofitted with these afterburners.

These afterburner lids are different than the close fitting lids identified earlier, as these lids actually destroy VOC emissions from the roofing kettle. These lids will achieve higher levels of VOC emission reduction than the close fitting lids (however they are more expensive).

8. Measuring/Monitoring and Record-Keeping

8.1 Introduction

A critical aspect of managing fugitive dust generation at construction and demolition sites is to undertake the necessary measuring and monitoring of specified activities and parameters. The measurement and monitoring program can assist in determining the need for and extent of fugitive dust actions as well as the effectiveness of these actions in mitigating fugitive dust. Equally important is that a systematic record-keeping process be established and maintained throughout the duration of the construction/demolition project. This typically takes the form of maintaining a daily record-keeping log. Guidance and examples of measuring/monitoring and record-keeping activities are provided within this section of the Best Practices document.

It is recognized that measuring, monitoring and record-keeping is a time-consuming and costly endeavour. Regulatory authorities as well as construction companies are encouraged to consider these practices and implement where feasible and practical.

8.2 Measuring and Monitoring

The recommended procedures to measure and monitor opacity, stabilized surfaces and wind speed are provided below. Key parameters are considered to be among the most critical to measure/monitor at construction and demolition sites. There are other parameters that can also be monitored that relate to the generation of fugitive dust emissions. Construction and demolition firms are encouraged to work with their local permitting authority in order to identify which parameters should be measured and monitored in conjunction with their fugitive dust generating activities.

8.2.1 Opacity Monitoring

The opacity of dust leaving the property line where construction and demolition activities are being conducted, should not exceed 20%. The steps to follow in order to monitor opacity from fugitive dust sources are provided below.

Step 1: Stand at least 5 meters from the fugitive dust source in order to provide a clear view of the emissions with the sun oriented in the 140-degree sector to the back. Following the above requirements, make opacity observations so that the line of vision is approximately perpendicular to the dust plume and wind direction. If multiple plumes are involved, do not include more than one plume in the line of sight at one time.

Step 2: Record the fugitive dust source location, source type, method of control used if any, observer's name, certification data and affiliation, and a sketch of the observer's position relative to the fugitive dust source. Also, record the time, estimated distance to the fugitive dust source location, approximate wind direction, estimated wind speed, description of the sky condition (presence and colour of clouds), observer's position to the fugitive dust source, and colour of the plume and type of background on the visible emission observation from both when opacity readings are initiated and completed.

Step 3: Make opacity observations, to the extent possible, using a contrasting background that is perpendicular to the line of vision. Make opacity observations approximately 1 meter above the surface from which the plume is generated. Note that the observation is to be made at only one visual point upon generation of a plume, as opposed to visually tracking the entire length of a dust plume as it is created along a surface. Make two observations per source, beginning with the first reading at zero seconds and the second reading at five seconds. The zero-second observation should begin immediately after a plume has been created above the surface involved. Do not look continuously at the plume, but instead, observe the plume briefly at zero seconds and then again at five seconds.

Step 4: Record the opacity observations to the nearest 5% on an observational record sheet. Each momentary observation recorded represents the average opacity of emissions for a 5-second period.

Step 5: Repeat Step 3 and 4 until you have recorded a total of 12 consecutive opacity readings. There is no limit as to when the 12 consecutive readings must be taken. Observations immediately preceding and following interrupted observations can be considered consecutive.

Step 6: Average the 12 opacity readings. If the average opacity reading equals 20% or lower, the source is below the recommended opacity standard for construction and demolition sites.

8.2.2 Stabilized Surfaces

The purpose of this test is to check whether a property is sufficiently crusted to prevent windblown dust. The equipment that is needed for this test is as follows:

- One steel ball. Diameter - 1.6 cm (5/8 or 0.625 inches). Mass - 16-17 grams;
- A ruler or measuring tape; and
- A cardboard frame with a 30 by 30 cm (1 foot by 1 foot) opening (optional).

Step 1: Select a 30 by 30 cm (1 by 1 foot) survey area that is representative, or a typical example, of the crusted surface.

Step 2: Hold the small steel ball one (1) foot off the ground directly above your survey area. Use a ruler or measuring tape to make sure that your hand is at the correct distance above the ground. Drop the ball within the survey area.

Step 3: Pass/Fail Determination. Observe the ground around the ball closely before picking it up. Did the ball sink into the surface so that it is partially or fully surrounded by loose grains of dirt? Has it dropped out of view entirely? Then pick up the ball. Look closely where the ball fell. Are loose grains of dirt visible? If you have answered "yes" to any of the previous questions, the surface has failed the first drop test. Note that if the ball causes a slight indentation on the surface but you do not see loose grains, the surface has passed the test.

Step 4: Select two additional areas within the 1 by 1 foot survey area to drop the ball. Repeat steps 2 and 3. If the surface passes two or all three of the drop tests, the survey area is considered as passing the test.

Step 5: Select at least two other survey areas that are representative of the crusted surface. Pick the areas randomly and make sure they are spaced some distance apart. Drop the ball 3 times within each of these additional survey areas. Once again, if the surface passes the test twice or three times, count the survey area as passing the test.

Step 6: Examine Results. If all of the survey areas have passed the test, the surface is stable, or sufficiently crusted. If one or more survey areas have failed the test, the surface is insufficiently crusted.

8.2.3 Wind Speed

Site-specific wind monitoring at construction and demolition sites is encouraged due to improved accuracy when compared to regional wind monitors. Additionally, site-specific wind monitoring may document high winds that are not captured by regional wind monitors. The following guidance has been prepared to assist activities that conduct wind monitoring. Much of the guidance provided for measuring wind speed will only be practical for the largest of construction sites.

Aspects of a successful monitoring program include the selection of proper equipment, instrument siting, instrument and site maintenance, periodic audits and frequent data review. The instruments should be sited so as to characterize airflow between the source and receptor areas. In flat terrain, or where receptors are close to the source, one meteorological site may be adequate. Additional wind monitoring sites may be needed in complex terrain.

The standard sensor height for measuring surface winds in 10 meters above ground level over open, level terrain. This usually requires the installation of a tower or mast. For the instrument to be sited over open terrain, there should be minimal obstructions to the wind flow, such as from buildings, hills or trees. In general, wind sensors should be located where the distance from the sensors to any obstruction is at least 10 times the height of that obstruction. When mounted on a building, wind sensors should be mounted 1.5 times the height of the building above the rooftop. Since these siting guidelines are sometimes not possible, especially in urban areas, it is recommended that siting that deviates from these guidelines be reviewed by local permitting authorities or an experienced consultant prior to installation.

Data recorders are the preferred method of recording and archiving the data. They are more precise and require less maintenance that strip chart recorders. Data loggers also allow data to be transmitted by telephone or radio to a central computer. Data records must be kept for a period of at least three years after the need for data collection has ended. Data recovery from a self-maintained meteorological system should be at least 90% complete on an annual basis, with no large data gaps (i.e., gaps greater than two weeks). The use of data recorders will likely only be practical for the largest of construction sites.

The U.S. Environmental Protection Agency recommends a sampling frequency of once per second, which is typical for quality data loggers. Wind-averaging periods may depend on the purpose of the data collected and the need to meet specific regulatory requirements. Either 1 hour or 15-minute averaging periods are common.

For wind sensors, the starting threshold must be rated at no higher than 0.5 meters per second (m/s). If there is some suspicion that the site would have a significant number of hours of wind speeds under 0.5 m/s, sensors with a lower threshold, such as 0.2 m/s, should be used. Wind speed systems should be accurate to within 0.2 m/s ± 5% of the observed speed. Total wind direction system errors should not exceed 5 degrees. This includes an instrument accuracy of ± 3 degrees for linearity and ± 2 degrees for alignment to a known direction.

Frequent data review, preferably on a daily basis, is critical for collecting good meteorological data. In addition, visual inspections of each site should be made at least once every month. This will help to identify sensor alignment problems that may not be obvious in the data.

In order to ensure that the sensors operate within the manufacturer's specifications, a calibration of the sensors should be performed once every six months by a trained technician or the sensor manufacturer. In corrosive, marine or dusty conditions, more frequently calibrations may be needed. Spare sensors are helpful to avoid data loss while sensors are brought down for calibration and repair. A logbook of calibrations and repairs should be kept.

Data that is critical for regulatory purposes should be independently audited by a qualified individual who is not affiliated with the organization that maintains and calibrates the instrument. The audits should be on a schedule that is appropriate for the measurements. Typically, once per year is adequate if a routine maintenance and calibration schedule is kept. An audit report should be written and problems should be corrected as soon as possible. The audit should compare the individual sensors to the sensor performance criteria and also look at the data collection system as a whole, including the data logger and siting, to ensure that the data are representative and accurate.

8.3 Record-keeping

Construction/demolition projects should maintain daily self-inspection records and this information should be retained for at least 3 years after project completion. Fuel use records should be kept. Additionally, any activity that utilizes chemical dust suppressants for dust control should maintain records indicating type of product applied, vendor name, and the method, frequency, concentration and quantity of application. All record-keeping information should be made available to the local permitting authority immediately upon request. A copy of the record-keeping should also be retained on-site.

Provided below are examples of daily record-keeping forms that can be used by construction and demolition firms, specifically related to practices to reduce PM emissions. Consideration should also be given to maintaining records of fuel usage/equipment maintenance in order to ensure proper management of fuel consumption.

Sample Daily Record-keeping Form for Fugitive Dust Abatement

Project Name:__________________ Project Location:__________________ Date:___________________

Each time you visually check an area for dust control measure implementation, write the time in the shaded box at the top of the table and write a “Y”, “N” or “NA”, in the boxes below your recorded time. Use the “Comments” column to record other pertinent information (e.g., describe the corrective action taken).

								Comments
1. Before Dust Generation Operations Occur								
Pre-watering to depth of cuts?								
Pre-watering storage piles?								
Work phased/disturbance minimized?								
Water trucks being operated?								
Water trucks being filled?								
Other (specify in Comments column)								
2. During Dust Generating Operations								
Is visible dust present?								
Applying water?								
Applying dust suppressant(s) other than water?								
Fences 3’-5’ with 50% porosity intact?								
Shut down operations?								
Checked control measures before leaving the work site for the day?								
Other (specify in Comments column)								
3. Unpaved Haul/Access Roads								
Is visible dust present?								
Vehicles travelling less than 15 miles per hour (24 kilometers per hour)?								
Is road visibly moist?								
Is road covered with gravel, recycled asphalt or other suitable material?								
Applying dust suppressant(s) other than water?								
Other (specify in Comments column)								
4. Loading, Unloading and Storage Piles								
Is visible dust present?								
Pre-watering material?								
Water being applied during loading/unloading?								
Other (specify in Comments column)								
5. Trackout/Access Points								
Is trackout control device intact?								
Cleaned-up trackout?								
Other (specify in Comments column)								
6. Temporary Site Stabilization								
Applying water?								
Applying dust suppressant(s) other than water?								
Other (specify in Comments column)								

Total Number of Litres Applied:_________ Responsible Person’s Signature and Title:________________

Sample Daily Record-keeping Form for Fugitive Dust Abatement

A daily log should be maintained that records the actual implementation of measures to mitigate fugitive dust generation. Write “yes” or “no” for each question in the Table below.

Elements Monitored	8AM	9AM	10AM	11AM	12PM	1PM	2PM	3PM	4PM	5PM	Comments
Forecasted high winds											
Wind speed											
Wind direction											
# of water trucks operating											
# of water trucks available											
Roads moist/watered											
Unstabilized areas moist/watered											
Dry areas observed											
Irrigation working											
Water tanks filled											
Water pumps working											
Chemical stabilization used											
Track-out observed											
Blow sand observed on-site											
Blowing dust observed on-site											
Blowing dust observed off-site											
Wind/snow fence maintained											
# of complaints received											
Corrective action taken											

N = No or None Y=Yes N/A = Not Applicable

Name______________________ Date______________________

Additional Comments:

9. Members of the Construction and Demolition Multi-stakeholder Working Group

Name	Organization
Patrick Georges	Environment Canada
Monique Gilbert	Ville de Montréal
Dave Gylywoychuk	Manitoba Heavy Construction Association
John Jonasson	Manitoba Conservation Pollution Prevention
Dan Jutzi	Environment Canada
Jim Mahon	Ontario Environment Network
Tim Smith	Cement Association of Canada
Gerry Ternan	Environment Canada, Atlantic Region
Bruce Walker	STOP
Shelley Wearmouth	Wearmouth Demolition
Observers:	
Roch Berubé	Association de la construction du Québec
Jacques Blanchard	Ville de Montréal

Demolition/Deconstruction Sub-committee

Name	Organization
Estelle Coté	Consultant
Corinne Fulton	3R Demolition Corp.
Monique Gilbert	Ville de Montréal
Tracey Inkpen	Environment Canada
Jim Mahon	Ontario Environment Network
Olga Schwartzkopf	Soil and Water Conservation Society, BC Chapter
Jo-Anne St. Godard	Recycling Council of Ontario
Fred Topley	Greenspoon Specialty Contracting
George Venta	Cement Association of Canada
Shelley Wearmouth	Wearmouth Demolition
Observers:	
Roch Berubé	Association de la construction du Québec

Residential and Commercial Building Design Sub-committee

Name	Organization
Vince Catalli	Royal Architectural Institute of Canada
Estelle Coté	Consultant
Bruce Gillies	Environment Canada, Ontario Region
Dan Jutzi	Environment Canada
Jo-Anne St. Godard	Recycling Council of Ontario
Anna Tilman	Save the Oak Ridges Morraine
George Venta	Cement Association of Canada
Alex Zimmerman	Canada Green Building Council

Residential and Commercial Building Construction Sub-committee

Name	Organization
Estelle Coté	Consultant
Monique Gilbert	Ville de Montréal
Tracey Inkpen	Environment Canada
Christopher Morgan	City of Toronto
Olga Schwartzkopf	Soil and Water Conservation Society, BC Chapter
Anna Tilman	Save the Oak Ridges Moraine
John Volcko	PCL Construction
Observers:	
Roch Berubé	Association de la construction du Québec
Jacques Blanchard	Ville de Montréal

Architectural Surface Coatings Sub-committee

Name	Organization
Heather Atkinson	Environment Canada
Vince Catalli	Royal Architectural Institute of Canada
Estelle Coté	Consultant
Sue Fraser	Environment Canada
Barry Law	Master Painters Institute
Ian Meredith	Terra Choice Environmental Marketing
Olga Schwartzkopf	Soil and Water Conservation Society, BC Chapter
Bruce Walker	STOP

10. Bibliography

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32. Maricopa County Environmental Services Department, *Guidance for Filling-out An Application for an Earthmoving Project*.
33. Maricopa County Environmental Services Department, *Control Fugitive Dust at Construction Projects – Prepare Your Site for a Compliance Inspection*.
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11. Selected Sources to Obtain Additional Information

Topic/Area	Organization	Link
Associations	Canadian Construction Association	http://www.cca-acc.com/
	Canadian Home Builders' Association	http://www.chba.ca/
	Construction Sector Council	http://www.csc-ca.org/
Selection of Green Materials	Canadian Green Building Council	http://www.cagbc.org/
	Leadership in Energy and Environmental Design (LEED Canada)	http://www.cagbc.ca/building_rating_systems/leed_rating_system.php
	Canadian Construction Association's Green Building Resource Centre	http://www.cca-acc.com
	Green Globes Canada	http://www.greenglobes.com/design/homeca.asp
	Athena Sustainable Materials Institute	http://www.athenasmi.ca/
	U.S. Green Building Council	http://www.usgbc.org/
	LEED U.S.	http://www.usgbc.org/LEED/LEED_main.asp
	Environmental Choice Program	http://www.environmentalchoice.com
Dust Control Websites/Reports	New Mexico Environment Department	http://www.nmenv.state.nm.us/aqb/dust_control.html
	Maricopa County (Arizona) Dust Devil Academy	http://www.maricopa.gov/sbeap/dust_main.aspx
	Clark County (Nevada) Construction Activities Dust Control Handbook	http://www.co.clark.nv.us/air_quality/Permitting-Applications/Dust%20Control%20Handbook.pdf
	Coachella Valley (California) Fugitive Dust Control Handbook	http://www.cvag.org/depts/CV_DCH.pdf
	Alberta Roadbuilders and Heavy Construction Association Pollution Prevention Manual	http://www.arhca.ab.ca/order_pollutionmanual.php
Pollution Prevention	Canadian Centre for Pollution Prevention	http://www.c2p2online.com
	Pollution Prevention Information Centre – Residential Construction	http://peakstoprairies.org/topichub/toc.cfm?hub=31&subsec=7&nav=7
	Low Sulphur Fuels Procurement Guide	http://www.ec.gc.ca/energ/ecology/LSF/ecological_measures_e.cfm
Journals	Grading & Excavation Contractor	http://www.forester.net/gec.html
	Erosion Control	http://www.distributednrg.com/ec.html

Appendix D-7

Ministry of the Environment and Climate Change

Central Region
Technical Support Section

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Ministère de l'Environnment et de l'Action en matière de changement climatique

Région du Centre
Section d'appui technique

5775, rue Yonge, 8ième étage
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Ontario

August 21, 2015

TO: **Gavin Battarino**

FROM: **Marinha Antunes**

Subject: **Technical Support Air Quality Comments**

Air Quality
Finch West Light Rail Transit
Maintenance and Storage Facility
FINAL Environmental Project Report (July 2015)

The following memorandum summarizes Central Region Technical Support Section (TSS) Air Unit comments on the *Environmental Project Report* (EPR) and *Appendix D.* "*Finch West Light Rail Transit Maintenance and Storage Facility Air Quality Assessment Report* "(AQA) in support to the Finch West Light Rail Transit Maintenance and Storage Facility Transit Assessment prepared by AECOM and dated July 24, 2015.

The AQA has addressed the majority of our comments on the draft AQA. At this time, we offer additional comments summarized below:

1. Although, additional information was provided to clarify the wheel truing process, the rationale that the process is considered insignificant as noted in Section 2.7 is insufficient. It is still unclear how the intensity of the operation on a weekly basis is. TSS recommends to address this item during the Environmental Compliance Approval (ECA) submission by including how many wheels are required to fill the 55 gallon drum before is sent to recycling, and how many wheels are serviced in one hour. This information will determine if in fact the fugitive dust is insignificant from the wheel truing process.

2. For our comment regarding the ministry's guidelines to screen out air emission sources, our intent was to apply the *Emission Summary Dispersion Report* (ESDM) guideline to determine the significant sources of emissions only and not to apply them to screen out the contaminants from modelling as done in Appendix D. Since the AQA is to support an Environmental Assessment, all contaminants released from the proposed undertaking must be assessed and compared with the ambient air quality criteria (AAQC), which is different from an ECA submission.

For future AQA submissions in support to an Environmental Assessment, please note that all contaminants must be assessed and not only the significant contaminants.

3. Based on the contaminants screening assessment with Emission Threshold summarized in Appendix D, the ministry's guidance is only applicable to the ministry's point of impingement (POI) limits and JSL list as stipulated in ESDM guidance document - Appendix B "*Supporting information for the Assessment of the significance of Contaminants and Sources*". This methodology is not applicable to the AAQC as done in the AQA. For future EA submissions, please assess all contaminants from the proposed undertaking.

4. Please note that if the emission threshold is greater than JSL, a maximum ground level concentration (GLC) submission should be sent to Standards Development Branch for their review during the ECA submission.

5. Lastly, there appears to be an overestimation on Chromium VI emissions on page 17 under Section 5.2.3 which refers to the Chromium emission factor of 0.1 g/kg, however based on the US EPA Chapter 12.19, the emission factor should be 0.1 x 10^{-1} (0.01) g/kg of rod consumed.

In summary, the AQA has addressed the majority of our comments on the draft AQA. The above additional comments should be addressed during the ECA submission.

Should you have any questions or require clarification regarding these comments please have the proponent or their consultant contact me at (416) 326-3526.

Marinha Antunes

Marinha Antunes
Air Quality Analyst
Central Region, Technical Support Section APEP
5775 Yonge Street, 8th Floor
Toronto, ON M2M 4J1

Cc: Chunmei Liu, Central Region TSS, Regional Environmental Planner
Paul Martin, Central Region TSS, Technical Support APEP Supervisor

Appendix E

Archaeology

E1. MTCS Archaeological Clearance Letter

Appendix E1: MTCS Archaeological Clearance Letter

Ministry of Culture

Culture Programs Unit
Programs and Services Branch
400 University Avenue, 4th floor
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Ministère de la Culture

Unité des programmes culturels
Direction des programmes et des services
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Ontario

January 6, 2009

Ms. Katie Bryant
Archaeological Services Inc.
528 Bathurst Street
Toronto ON M5S 2P9

Ms. Debbie Steiss
Archaeological Services Inc.
528 Bathurst Street
Toronto ON M5S 2P9

RE: Review and Acceptance into the Provincial Register of Reports: Archaeological Assessment Report Entitled, "Stage 1 and 2 Archaeological Assessment of Part of Lot 21, Concession 5 W.Y.S. Geographic Township of York, County of York, (Formerly City of North York) Now in the City of Toronto", Report Dated May, 2008, Report Received June 18, 2008, MCL Project Information Form Numbers P264-025-2008 & P049-293-2008, MCL RIMS Number 20SP185

Dear Ms. Bryant and Ms. Steiss:

This office has reviewed the above-mentioned report, which has been submitted to this Ministry as a condition of licensing in accordance with Part VI of the Ontario Heritage Act, R.S.O. 1990, c 0.18. This review is to ensure that the licensed professional consultant archaeologist has met the terms and conditions of their archaeological licence, that archaeological sites have been identified and documented according to the 1993 technical guidelines set by the Ministry and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario.

As the result of our review, this Ministry accepts the above titled report into the Provincial register of archaeological reports. No archaeological sites were documented. It is recommended that there are no further concerns for alterations to archaeological sites for the area that has undergone archaeological assessment. This Ministry concurs with this recommendation.

Given the above, this Ministry is satisfied that concerns for archaeological sites have been met for the area of this development project as depicted by Figure 5 of the above titled report and as depicted by the plan of survey Registered Plan M-1994 prepared by I.M Pastushak Limited, Ref: P07-09, dated March 7, 2007, signed by P. Hofmann, O.L.S., dated March 13, 2007, comprising a total area of 8.225 hectares.

Should you require any further information regarding this matter, please feel free to contact me.

Sincerely,

Norbert Stanchly

A/Archaeology Review Office

cc. Archaeological Licensing Office
Elderbrook Developments Limited
Susan Hughes, Heritage Preservation Services, City of Toronto

E2. Stage 1 and 2 Archaeological Assessment Report

Stage 1 and 2 Archaeological Assessment
Of Part of Lot 21, Concession 5 W.Y.S.
Geographic Township of York, County of York
(Formerly City of North York) Now in the City of Toronto

Submitted to:

Elderbrook Developments Limited
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M3B 3P6
Tel: (416) 510-1700
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Prepared by

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Archaeological Consulting License P264/P049
MCL CIF #s: P264-025-2008, P049-293-2008
ASI File # 08TS-023, 08TS-064

May 2008

PROJECT PERSONNEL

Project Manager:	Dr. Ron Williamson
Project Directors:	Ms. Katie Bryant (Stage 1) Ms. Debbie Steiss (Stage 2)
Field Directors:	Mr. John Dunlop (Stage 1) Ms. Aleks Pradzynski (Stage 2) Ms. Katie Bryant (Stage 2)
Field Archaeologists:	Ms. Amy Fox Ms. Kayla Reynolds Ms. Alisha Mohammed Mr. John Sleath Ms. Tegan Kenward Ms. Rachael Johnston
Report Preparation:	Mr. John Dunlop Ms. Andrea Williams
Graphics:	Mr. John Dunlop Ms. Andrea Williams
Artifact Processing and Analysis:	Ms. Kristine Crawford
Report Reviewer:	Ms. Beverly Garner

Stage 1 and 2 Archaeological Assessment
Of Part of Lot 21, Concession 5 W.Y.S.
Geographic Township of York, County of York
(Formerly City of North York) Now in the City of Toronto

1.0 INTRODUCTION

Archaeological Services Inc. was contracted by Elderbrook Developments Limited of Toronto, Ontario to conduct a Stage 1 and 2 archaeological assessment of the property located on Part of Lot 21, Concession 5 W.Y.S. in the former City of North York, now the City of Toronto. The study area is located on the north side of Finch Avenue, and is bounded to the east by York Gate Boulevard, to the west by Norfinch Drive and to the north by the Norfinch Sports Fields (Figure 1). The property encompasses approximately 8 ha.

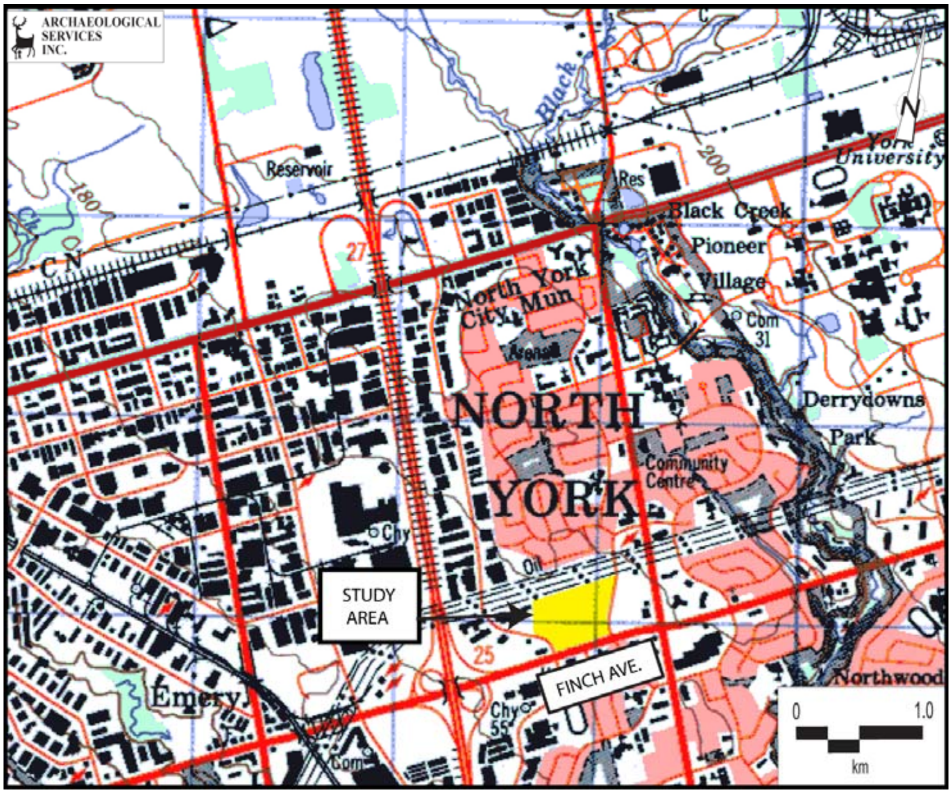

Figure 1: The study area located on the NTS Map Bolton 30M/13 7th Edition, 1994

The Stage 1 archaeological assessment was conducted under the project direction of Ms. Katie Bryant, under license P264 issued to Ms. Bryant (MCL CIF P264-025-2008), in accordance with the Ontario Heritage Act. Mr. John Dunlop was the field director. The Stage 2 archaeological assessment was conducted under the project direction of Ms. Debbie Steiss, under license P049 issued to Ms. Steiss (MCL CIF P049-293-2008), in accordance with the Ontario Heritage Act. Ms. Aleks Pradzynski was the field director. Dr. Ron Williamson was the project manager for both assessments.

Permission to access the study area and to carry out the activities necessary for the completion of the Stage 1 field review was granted by Elderbrook Developments Limited in February, 2008.

2.0 STAGE 1 BACKGROUND RESEARCH

Background research was completed to identify any archaeological sites in the study area and to assess the area's archaeological potential. Background research consists of an examination of the study area's physiography, any associated previous archaeological research, a review of historic mapping, and a summary of archaeological potential.

2.1 Physiography

The study area is situated within the Peel Plain physiographic region of southern Ontario (Chapman and Putnam 1984:174-176). The Peel Plain physiographic region covers a large area across the central portions of the Regional Municipalities of York, Peel and Halton, as well as part of the Regional Municipality of Durham. The surface of the plain is characterized by level to gently rolling topography, with a consistent, gradual slope toward Lake Ontario. The plain is made up of deep deposits of dense, limestone- and shale-imbued till, often covered by a shallow layer of clay sediment. Several major water courses, including the Don River, cut across the plain, draining southward into Lake Ontario. The study area itself consists of level terrain. The closest water source to the study area is a historic tributary of Black Creek which flows 25 metres to the east of the study area as indicated in the *Master Plan of Archaeological Resources for the City of Toronto, Interim Report* (ASI 2004). There are historic headwaters of a tributary of Emery Creek located along the western boundary of the study area as indicated on both *Tremaine's 1860 Map of York County* and the *1878 Illustrated Historical Atlas of York County*. Currently a tributary of Black Creek is located approximately 500 metres east of the subject property (Figure 1).

2.2 Previous Archaeological Research

In order that an inventory of archaeological resources could be compiled for the study area, three sources of information were consulted: the site record forms for registered sites housed at the Ministry of Culture; published and unpublished documentary sources; and the files of Archaeological Services Inc., including the interim report of the *Master Plan of Archaeological Resources for the City of Toronto, Interim Report* (ASI 2004). In Ontario, information concerning archaeological sites is stored in the Ontario Archaeological Sites Database (O.A.S.D.), a database maintained by the Ministry of Culture. This database contains archaeological sites registered within the Borden system.

In Ontario, information concerning archaeological sites is stored in the Ontario Archaeological Sites Database (OASD), a database maintained by the MCL. This database contains archaeological sites registered within the Borden system. The Borden system was first proposed by Dr. Charles E. Borden, and is based on a block of latitude and longitude. A Borden block is approximately 13 kilometres east west by 18.5 kilometres north south. Sites within each block are numbered sequentially as they are found. The study area under review is found within Borden Block *AkGv*.

While no archaeological sites have been registered within the study area, five sites have been registered within a two kilometre radius of the study area limits. These sites are summarized in Table 1 below.

Table 1: Registered Archaeological Sites within 2 km of the Study Area

Borden	Site Name	Cultural Affiliation	Site Type	Researcher
AkGv-12	Emery	Late Woodland	Campsite	Father Meighan 1950
AkGv-70	Boynton	Historic Euro-Canadian	Homestead	ASI*1988
AkGv-71	Bramalae	Archaic	Findspot	ASI 1988
AkGv-9	Supertest	Undetermined Precontact	Campsite	Father Meighan 1950
AkGv-8	E. A. Parsons	Late Woodland	Village	ASI 1998 Norman Emerson 1953 John Morrison 1982 J. V. Wright 1966

*ASI = Archaeological Services Inc.

The large, late 15th century **E.A. Parsons site (AkGv-8)**, a Late Iroquoian village site near the campus of York University, has been subject to a number of excavations beginning with those carried out by Emerson in the 1950s. In the late 1980s, pre-development excavations at the site documented portions of ten house structures, several large refuse heaps known as middens and an extensive palisade (Williamson and Robertson, 1998). The Parsons Site is located approximately one kilometre east of the subject property.

Water is the single most important resource necessary for any extended human occupation or settlement. Since water sources have remained relatively stable in southern Ontario after the Pleistocene era, proximity to water can be regarded as the primary indicator of archaeological site potential. Accordingly, distance from water is one of the most commonly used variables for predictive modelling of archaeological site location.

The Ministry of Culture Primer on Archaeology, Land Use Planning and Development in Ontario (1997:12-13) stipulates that undisturbed land within 300 metres of a primary water source (lakeshore, river, large creek, etc.), and undisturbed land within 200 metres of a secondary water source (stream, spring, marsh, swamp, etc.), as well as undisturbed land within 300 metres of an ancient water source (as indicated by remnant beaches, shore-cliffs, terraces, abandoned river channel features, etc.), are considered to have archaeological potential.

This basic potential model has been further refined for the City of Toronto, as part of the City's Master Plan of Archaeological Resources, currently in development. The *Master Plan of Archaeological Resources for the City of Toronto, Interim Report* (ASI 2004) lists proximity to water as one of the indicators of potential for the presence of precontact Aboriginal archaeological sites.

According to the model, land within 250 metres of an extant or formerly mapped river or creek, or within 250 metres of the pre-development shoreline of Lake Ontario, has potential for the presence of precontact Aboriginal archaeological sites. In addition, this potential is extended to any floodplain land and to land in close proximity to the Lake Iroquois strand (i.e. land above and within 200 metres of the strand, or below and within 100 metres of the strand). Based on the relative proximity of hisotric water sources, such as the tributary of Black Creek and the tributary of Emery Creek, there is the potential for the identification of precontact archaeological remains, depending on the degree of more recent disturbances.

2.3 Review of Historical Maps

The 1851 *Browne's Map of York Township*, the 1860 *Tremaine's Map of York County*, and the 1878 *Illustrated Historical Atlas of York County* were reviewed to determine the potential for the presence of historic archaeological remains within the study area which comprises Part of Lot 21, Concession 5 West of Yonge Street, Township of York, County of York (Figure 2).

According to *Browne's 1851 Map*, only those sections of Lot 21 closest to main north-south roads had been cleared; the study area was uncleared forest at the time.

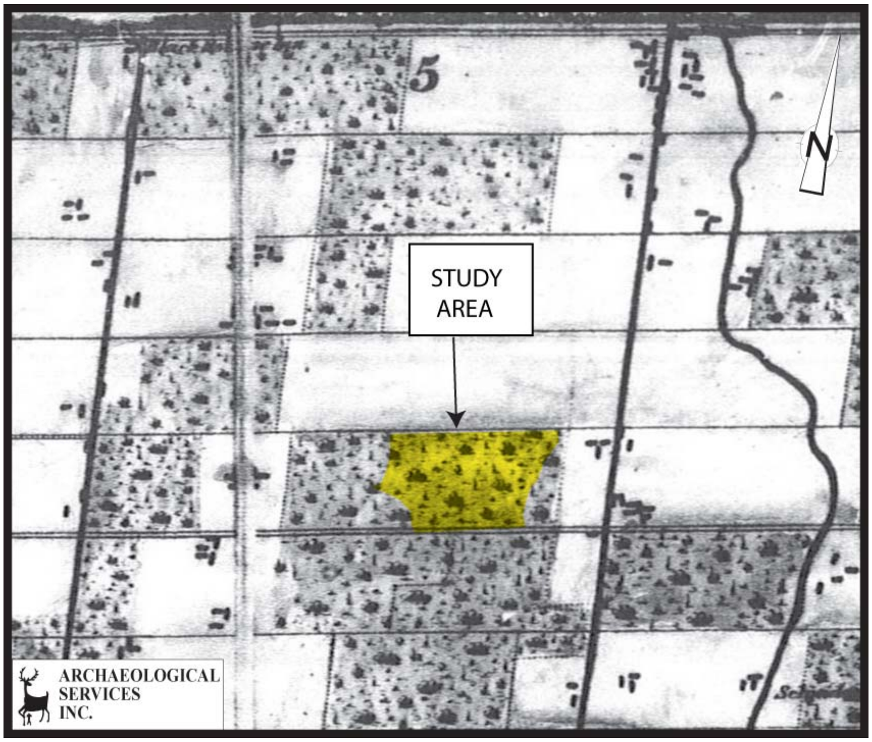

Figure 2: The study area located on *Browne's 1851 Map of York Township*

Tremaine's 1860 Map indicates that Lot 21 was divided up into three parcels (Figure 3). The study area is located straddling two parcels, owned by Mr. William Crosson and Mr. Henry Crosson. There are no features illustrated within the study area, however, the headwaters of the tributary of Emery Creek are illustrated as flowing within the western boundary of the study area.

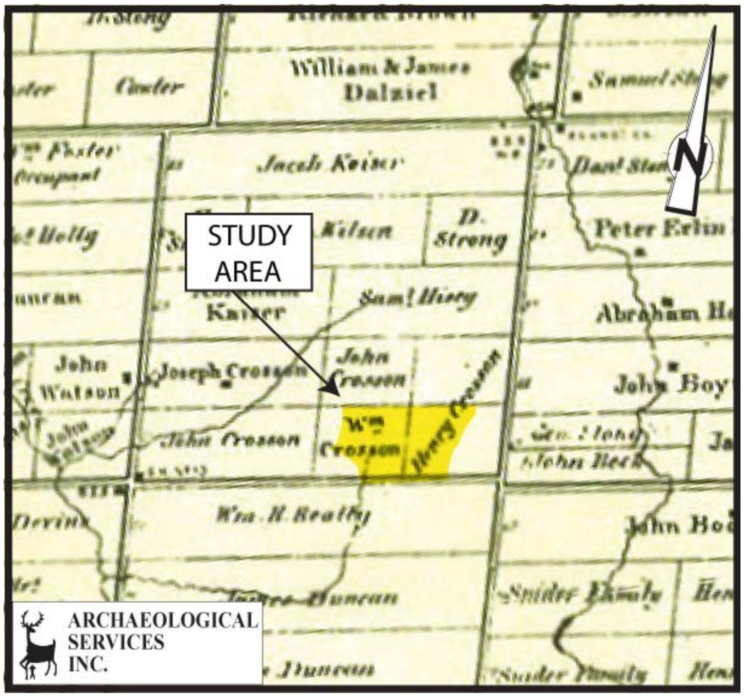

Figure 3: The study area located on *Tremaine's 1860 Map of York County*

The *1878 Illustrated Historical Atlas of York County* indicates that the study area is located within lands owned by Mr. Joseph Crosson (Figure 4). There are no buildings illustrated within the study area, however, the headwaters of the tributary of Emery Creek are illustrated as flowing just outside the western boundary of the study area. An orchard is also illustrated within the study area, adjacent to the headwaters.

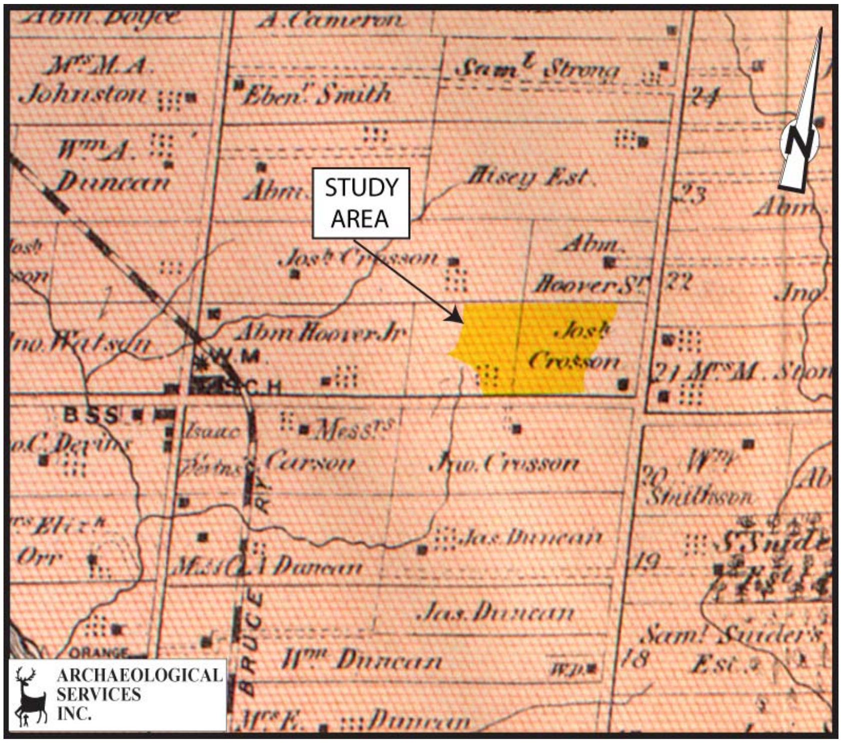

Figure 4: The study area located on the *1878 Illustrated Historical Atlas of York County*.

It should be noted that not all features of interest were mapped systematically in the Ontario series of historical atlases, given that they were financed by subscription, and subscribers were given preference with regard to the level of detail provided on the maps. Moreover, not every feature of interest would have been within the scope of the 1878 *Atlas*.

2.4 Summary of Archaeological Potential

Based on the presence of four precontact sites within two kilometres of the study area and the close proximity of the historic tributary of Black Creek and the head waters of the tributary of Emery Creek, the study area has potential for the identification of precontact archaeological remains.

For the Euro-Canadian period, the majority of early nineteenth century farmsteads (i.e., those which potentially have the most significant resources and whose locations are rarely recorded on nineteenth century maps) are likely to be captured by the basic proximity to water model outlined above, since these occupations were subject to similar environmental constraints. An added factor, however, is the development of the network of concession roads throughout the course of the nineteenth century. These transportation routes, such as Finch Avenue, were loci for Euro-Canadian domestic, commercial, and institutional land use. It must be noted, however, that not all features of interest today would have been considered within the scope of the *Atlas* at the time of publication. Therefore, depending on the degree of land disturbance, it may be concluded that the study area exhibits potential for the presence of historic archaeological remains.

3.0 STAGE 2 FIELD ASSESSMENT

A Stage 1 field review was conducted in order to confirm the assessment of archaeological site potential and to determine the degree to which development and landscape alteration may have affected that potential. The field review was conducted under the field direction of Mr. John Dunlop on February 21st, 2008. The Stage 2 assessment was carried out in order to inventory, identify and describe any archaeological resources extant on the subject property prior to development. The survey was conducted under the field direction of Ms. Aleks Pradzynski on May 14th, 2008 and under the field direction of Ms. Katie Bryant on May 27th, 2008. The weather was sunny and warm both days. Field observations have been compiled on project mapping for the study area (Figure 5).

There are two areas of disturbance located within the study area. The first area consists of an area of built up fill and gravel running along Finch Avenue and York Gate Boulevard (Plates 1 and 2). This area extends along the entire southern and eastern study area boundary and extends into the study area by approximately 10 metres. The second disturbed area is located in the northwest quadrant of the study area. This disturbed area measures approximately 20 metres by 30 metres and is comprised of several piles of construction debris (Plate 3). Due to the nature of the disturbances in these areas, they were deemed to not require survey.

There is a large, low lying wet area located along the western study area boundary (Plate 4). This area measures approximately 30 metres by 40 metres. Low, wet areas are considered to have no archaeological potential and therefore this area was not subject to survey.

There are two narrow treed areas within the northwest quadrant of the study area (Plates 5 and 6). The first area extends south into the study area from the northern study area boundary for approximately 80 metres and is 10 metres wide. The second area extends easterly into the study area from the western study area boundary for approximately 60 metres and is 10 metres wide. Both treed areas were subject to test pitting at five metre intervals. All soils were screened through a six millimetre mesh (Plate 7). All test pits were backfilled. Each test pit was excavated into the subsoil for an average depth of 20 centimetres. The topsoil encountered was comprised of sandy clay.

The remainder of the study area comprised open, former agricultural lands (Plates 8 and 9). These lands had been ploughed and well weathered and surficial visibility conditions were excellent. The soils consisted of sandy clay. These lands were subject to a pedestrian survey at five metre intervals.

3.1 Results of the Stage 2 Archaeological Assessment

During the course of the Stage 2 pedestrian survey, one pre-contact findspot **P1** was encountered.

P1

P1 was located on level ground approximately 40 metres north of the southern study area boundary and 80 metres east of the western study area boundary (Figure 5). A GPS co-ordinate of 17T 0618852 UTM 4845687 as established at the location of the first find. P1 consists of one piece of thermally altered shatter of Onondaga chert, while a secondary knapping flake of Onondaga chert was located 9 metres to the north (Table 2; Plate 10). The immediate 30 metre by 30 metre area surrounding the findspot was surveyed at one metre intervals, but despite careful scrutiny, no additional artifacts were encountered.

Table 2: Pre-contact Artifact Catalogue for P1

Cat. No.	Provenience	Qty	Description	Dimensions (mm)	Type/Comments
L1	Surface	1	Thermally altered shatter		Onondaga chert
L2	Surface	1	Secondary knapping flake		Onondaga chert

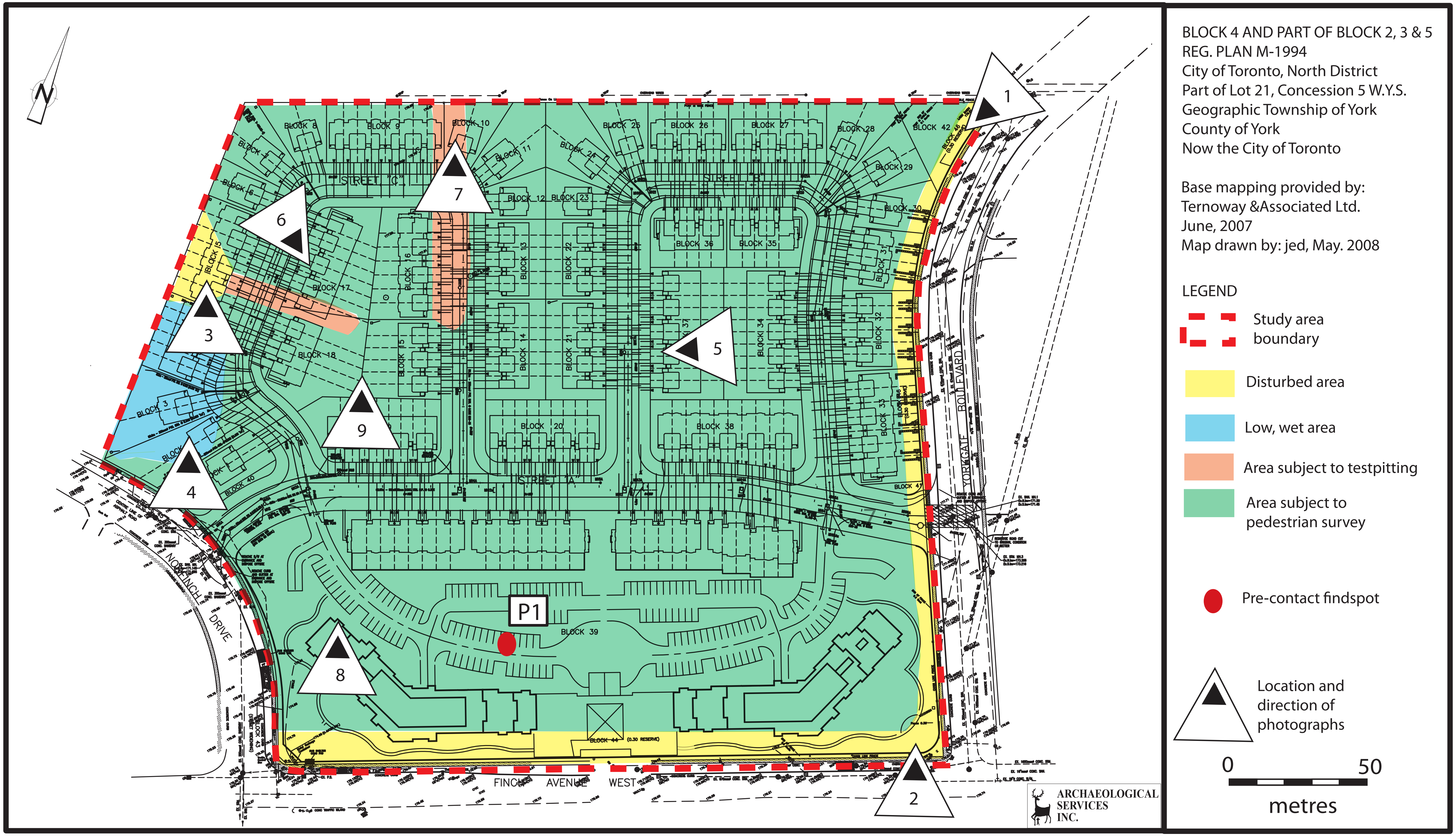

Figure 5: Stage 2 archaeologcial assessment of the study area.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The research carried out during the Stage 1 archaeological assessment of the property bounded by Finch Avenue, York Gate Boulevard, Norfinch Drive and the Norfinch Sports Field, Part of Lot 21, Concession 5 W.Y.S. in the former City of North York, now the City of Toronto, determined that no archaeological sites had been registered previously within the study area but that five sites had been registered within two kilometres of the study area. Based on the modelling criteria of the *Master Plan of Archaeological Resources for the City of Toronto*, the proximity of the registered sites, the tributary of Black Creek and the historic headwaters of the tributary of Emery Creek, as well as historic Finch Avenue, it was determined that the land exhibited potential for the presence of archaeological resources, depending on the extent to which previous land uses had disturbed the property.

The Stage 2 assessment of the study area was conducted through both pedestrian and test pit survey methodology. **P1**, a pre-contact findspot consisting of a thermally altered piece of shatter and a secondary knapping flake, both of Onondaga chert, were recovered.

In light of these considerations, the following recommendations are made:

1. Given the isolated nature of **P1**, this find does not represent a significant archaeological resource and may be considered free of any further archaeological concern.

2. The remainder of the study area may be considered free of any archaeological concern.

3. Should deeply buried archaeological remains be found on the property during construction activities, the Heritage Operations Unit of the Ministry of Culture should be notified immediately.

4. In the event that human remains are encountered during construction, the proponent should immediately contact both the Ministry of Culture, and the Registrar or Deputy Registrar of the Cemeteries Regulation Unit of the Ministry of Consumer and Business Services, (416) 326-8392.

The documentation related to the archaeological assessment of this project will be curated by Archaeological Services Inc. until such a time that arrangements for their ultimate transfer to Her Majesty the Queen in right of Ontario, or other public institution, can be made to the satisfaction of the project owner, the Ontario Ministry of Culture, and any other legitimate interest groups.

5.0 REFERENCES CITED

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Tremaine, George C.
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6.0 PHOTOGRAPHY

Plate 1: Disturbed area along eastern study area boundary.

Plate 2: Disturbed area along the southern study area boundary.

Plate 3: Disturbed area along the western study area boundary.

Plate 4: Low, wet area along the western study area boundary.

Plate 5: Tree line extending from the northern study area boundary.

Plate 6: Tree line extending from the western study area boundary.

Plate 7: Testpitting in the tree lines.

Plate 8: Field conditions in the southwest quadrant of the study area.

Plate 9: Field conditions in the northwest quadrant of the study area.

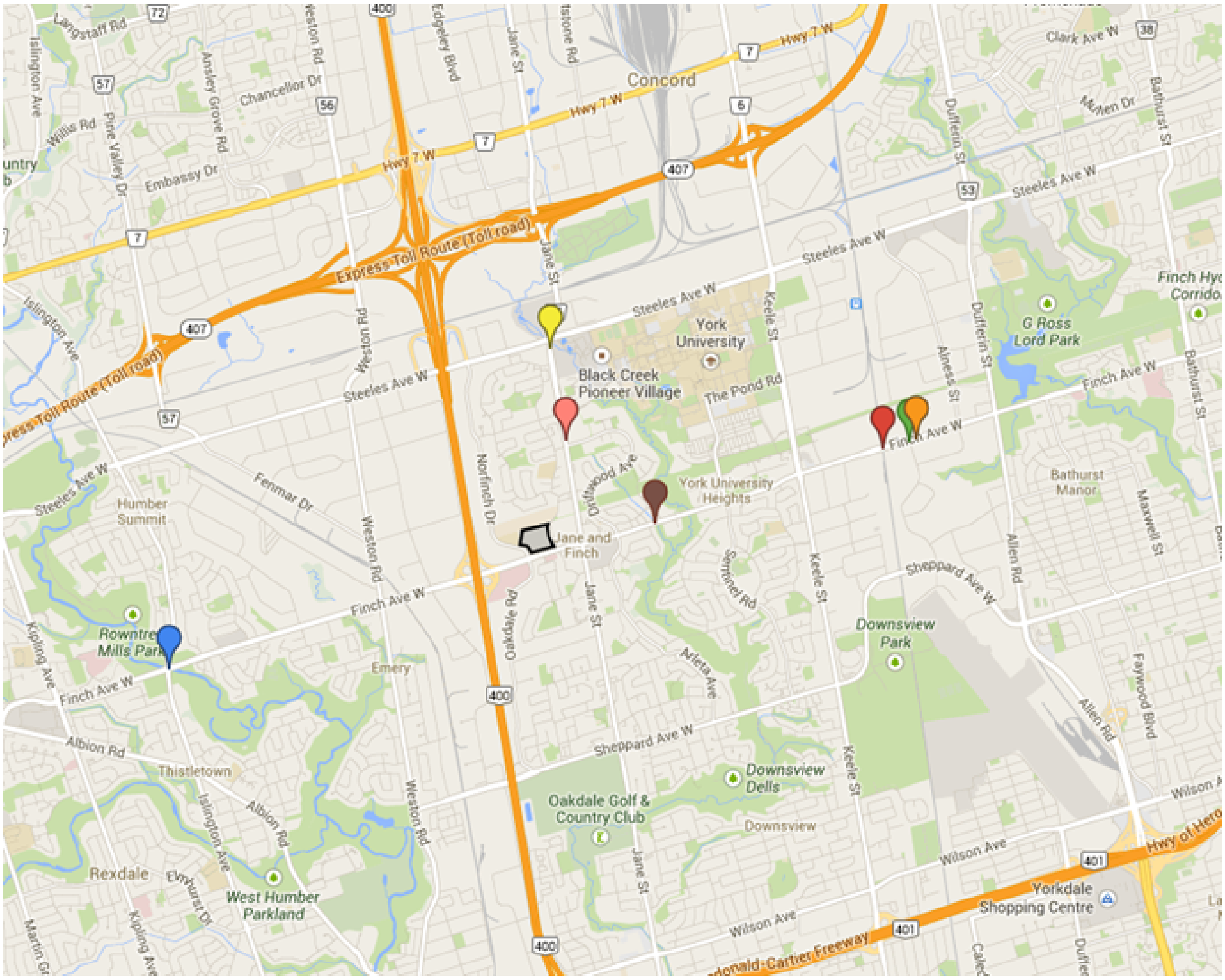
Plate 10: Artifacts recovered at **P1**: L1, thermally altered shatter, and L2, a secondary knapping flake.

Appendix F

Cultural Heritage

F1. Cultural Heritage Sites

Appendix F1: Cultural Heritage Sites



Proposed Finch West MSF Site
4509 Jane St
4929 Jane St
BHR 4- 1125 Finch Ave W
BHR 1- 1130 Finch Ave W
CHL 3 Finch Ave east of Jane St.
CHL 1 - Islington Ave
CHL 4 - Finch Ave - Keele & Dufferin

F2. MTCS Screening for Impacts to Cultural Heritage Checksheet

Site ID: LRT Finch West, Maintenance and Storage Facility (MSF)

Appendix F2: MTCS Screening for Impacts to Cultural Heritage Checksheet

Screening for Impacts to Built Heritage and Cultural Heritage Landscapes

This checklist is intended to help proponents determine whether their project could affect known or potential cultural heritage resources. The completed checklist should be returned to the appropriate Heritage Planner or Heritage Advisor at the Ministry of Tourism and Culture.

Step 1 – Screening for Recognized Cultural Heritage Value

YES	NO	Unknown	
☐	☒	☐	1. Is the subject property designated or adjacent* to a property designated under the *Ontario Heritage Act*?
☐	☒	☐	2. Is the subject property listed on the municipal heritage register or a provincial register/list? (e.g. Ontario Heritage Bridge List)
☐	☒	☐	3. Is the subject property within or adjacent to a Heritage Conservation District?
☐	☒	☐	4. Does the subject property have an Ontario Heritage Trust easement or is it adjacent to such a property?
☐	☒	☐	5. Is there a provincial or federal plaque on or near the subject property?
☐	☒	☐	6. Is the subject property a National Historic Site?
☐	☒	☐	7. Is the subject property recognized or valued by an Aboriginal community?

Step 2 – Screening Potential Resources

YES	NO	Unknown	**Built heritage resources** 1. Does the subject property or an adjacent property contain any buildings or structures **over forty years old**[†] that are:
☐	☒	☐	▪ Residential structures (e.g. house, apartment building, shanty or trap line shelter)
☐	☒	☐	▪ Farm buildings (e.g. barns, outbuildings, silos, windmills)
☐	☒	☐	▪ Industrial, commercial or institutional buildings (e.g. a factory, school, etc.)
☐	☒	☐	▪ Engineering works (e.g. bridges, water or communications towers, roads, water/sewer systems, dams, earthworks, etc.)
☐	☒	☐	▪ Monuments or Landmark Features (e.g. cairns, statues, obelisks, fountains, reflecting pools, retaining walls, boundary or claim markers, etc.)
☐	☒	☐	2. Is the subject property or an adjacent property associated with a known architect or builder?
☐	☒	☐	3. Is the subject property or an adjacent property associated with a person or event of historic interest?
☐	☒	☐	4. When the municipal heritage planner was contacted regarding potential cultural heritage value of the subject property, did they express interest or concern?
YES	**NO**	**Unknown**	**Cultural heritage landscapes** 5. Does the subject property contain landscape features such as:
☐	☒	☐	▪ Burial sites and/or cemeteries
☐	☒	☐	▪ Parks or gardens
☐	☒	☐	▪ Quarries, mining, industrial or farming operations
☐	☒	☐	▪ Canals
☐	☒	☐	▪ Prominent natural features that could have special value to people (such as waterfalls, rocky outcrops, large specimen trees, caves, etc.)
☐	☒	☐	▪ Evidence of other human-made alterations to the natural landscape (such as trails, boundary or way-finding markers, mounds, earthworks, cultivation, non-native species, etc.)
☐	☒	☐	6. Is the subject property within a Canadian Heritage River watershed?
☐	☒	☐	7. Is the subject property near the Rideau Canal Corridor UNESCO World Heritage Site?
☐	☒	☐	8. Is there any evidence from documentary sources (e.g., local histories, a local recognition program, research studies, previous heritage impact assessment reports, etc.) or local knowledge or Aboriginal oral history, associating the subject property/ area with historic events, activities or persons?

Note:

If the answer is "yes" to any question in Step 1, proceed to Step 3.

The following resources can assist in answering questions in Step 1:

Municipal Clerk or Planning Department – Information on properties designated under the Ontario Heritage Act (individual properties or Heritage Conservation Districts) and properties listed on a Municipal Heritage register.

Ontario Heritage Trust – Contact the OHT directly regarding easement properties. A list of OHT plaques can be found on the website: Ontario Heritage Trust

Parks Canada – A list of National Historic Sites can be found on the website: Parks Canada

Ministry of Tourism and Culture – The Ontario Heritage Properties Database includes close to 8000 identified heritage properties. Note while this database is a valuable resource, it has not been updated since 2005, and therefore is not comprehensive or exhaustive. Ontario Heritage Properties Database

Local or Provincial archives

Local heritage organizations*, such as the municipal heritage committee, historical society, local branch of the Architectural Conservancy of Ontario, etc.*

Consideration should also be given to obtaining oral evidence of CHRs. For example, in many Aboriginal communities, an important means of maintaining knowledge of cultural heritage resources is through oral tradition**.**

If the answer is "yes" to any question in Step 2, an evaluation of cultural heritage value is required. If cultural heritage resources are identified, proceed to Step 3.

If the answer to any question in Step 1 or to questions 2-4, 6-8 in Step 2, is “unknown”, further research is required.

If the answer is "yes" to any of the questions in Step 3, a heritage impact assessment is required.

If uncertainty exists at any point, the services of a qualified person should be retained to assist in completing this checklist. All cultural heritage evaluation reports and heritage impact assessment reports must be prepared by a qualified person. Qualified persons means individuals (professional engineers, architects, archaeologists, etc.) having relevant, recent experience in the identification and conservation of cultural heritage resources. Appropriate evaluation involves gathering and recording information about the property sufficient to understand and substantiate its heritage value; determining cultural heritage value or interest based on the advice of qualified persons and with appropriate community input. If the property meets the criteria in Ontario Regulation 9/06 under the Ontario Heritage Act, it is a cultural heritage resource.

[†] The 40 year old threshold is an indicator of potential when conducting a preliminary survey for identification of cultural heritage resources. While the presence of a built feature that is 40 or more years old does not automatically signify cultural heritage value, it does make it more likely that the property could have cultural heritage value or interest. Similarly, if all the built features on a property are less than 40 years old, this does not automatically mean the property has no cultural heritage value. Note that age is not a criterion for designation under the *Ontario Heritage Act*.

Step 3 – Screening for Potential Impacts

YES	NO	**Will the proposed undertaking/project involve or result in any of the following potential impacts to the subject property or an adjacent* property?**
☐	☐	**Destruction, removal or relocation** of any, or part of any, heritage attribute or feature.
☐	☐	**Alteration** (which means a change in any manner and includes restoration, renovation, repair or disturbance).
☐	☐	**Shadows** created that alter the appearance of a heritage attribute or change the exposure or visibility of a natural feature or plantings, such as a garden.
☐	☐	**Isolation** of a heritage attribute from its surrounding environment, context or a significant relationship.
☐	☐	**Direct or indirect obstruction** of significant views or vistas from, within, or to a built or natural heritage feature.
☐	☐	**A change in land use** such as rezoning a battlefield from open space to residential use, allowing new development or site alteration to fill in the formerly open spaces.
☐	☐	**Soil disturbance** such as a change in grade, or an alteration of the drainage pattern, or excavation, etc.

[*] For the purposes of evaluating potential impacts of development and site alteration “adjacent” means: contiguous properties as well as properties that are separated from a heritage property by narrow strip of land used as a public or private road, highway, street, lane, trail, right-of way, walkway, green space, park, and/or easement or as otherwise defined in the municipal official plan.

F3. Finch LRT Cultural Heritage Assessment

Cultural Heritage Assessment Report:
Built Heritage Resources and Cultural Heritage Landscapes

Etobicoke-Finch West Light Rail Transit Corridor
Humber College (North Campus) to Finch Subway Station
Transit Project Assessment Study, City of Toronto, Ontario

Submitted to:

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ASI File 08EA-148

June 2009 (August 2009)

Cultural Heritage Assessment Report:
Built Heritage Resources and Cultural Heritage Landscapes

Etobicoke-Finch West Light Rail Transit Corridor
Humber College (North) to Finch Subway Station
Transit Project Assessment Study, City of Toronto, Ontario

EXECUTIVE SUMMARY

Archaeological Services Inc. (ASI) was contracted by Delcan Corporation, Markham, to conduct a Cultural Heritage Resource Assessment as part of a Transit Project Assessment Study for the Etobicoke-Finch West Corridor Light Rail Transit (LRT) from the Finch Subway Station to Humber College (North Campus), in the City of Toronto.

The Cultural Heritage Resource Assessment determined that the study corridor has origins in nineteenth century survey and settlement and has been substantially altered by urbanization. However, a select number of cultural heritage resources continue to exist within the study corridor limits. A total of five built heritage resources (BHR) and seven cultural heritage landscapes (CHL) were identified in the study corridor. Of these, one has been designated under the *Ontario Heritage Act*, three have been listed on the City of Toronto's Heritage Property Inventory, and one is currently recommended for designation under the *Ontario Heritage Act*. Additionally, two built heritage resources and seven cultural heritage landscapes were identified through a combination of historic mapping, field review techniques, contextual contribution of the feature, and documented architectural or material detailing. Based on these results, the following mitigation measures are recommended:

- The proposed light rail transit infrastructure should be designed so as to avoid identified cultural heritage resources. Where loss or displacement is expected, further research should be undertaken to evaluate the impacted feature's specific cultural heritage significance. Based on the results of evaluation, appropriate mitigation measures should be developed;

- Based on a preliminary review of select design plans, ASI understands that one feature may be indirectly impacted (BHR 3) to accommodate construction of a stop facility. A review of preliminary design drawings indicates that construction of a stop facility in this area may result in a reduced buffer zone between the structure and the road right-of-way and potential visual impacts. Given that this structure is listed on the City of Toronto's Heritage Properties Inventory and has been recommended for designation under the *Ontario Heritage Act,* a heritage impact study is recommended. This study should consider the site's known or potential cultural heritage value and identify proposed impacts and develop appropriate mitigation measures to ensure the long-term conservation of the structure; and

- Based on a preliminary field review of the study corridor, indirect impacts to cultural heritage resources via introduction of visual, audible, and/or atmospheric elements associated with light rail transit are not a concern from a cultural heritage point of view. With the exception of BHR 1, all of the identified resources that would be subject to introduction of such elements were constructed during the twentieth century and are contextually congruent with a modern transit corridor. Indirect impacts to BHR 1, via introduction of audible and atmospheric elements associated with light rail transit infrastructure, are considered negligible given that Finch Avenue West currently functions as a high traffic arterial road in the vicinity of this structure.

ARCHAEOLOGICAL SERVICES INC.
ENVIRONMENTAL ASSESSMENT DIVISION

PROJECT PERSONNEL

Senior Project Manager:	Robert Pihl, MA CAHP Partner and Senior Archaeologist, Manager Environmental Assessment Division
Project Manager:	Rebecca Sciarra, MA CAHP Heritage Planner
Cultural Heritage Specialist:	Rebecca Sciarra
Project Historian:	Lindsay Popert, MA CAHP Assistant Heritage Planner
Project Administrator:	Sarah Jagalewski, BA Research Archaeologist
Report Preparation:	Rebecca Sciarra
Graphics Preparation:	Sarina Finlay, BA GIS Specialist Lindsay Popert
Report Reviewer:	Lindsay Popert

TABLE OF CONTENTS

1.0 INTRODUCTION

Archaeological Services Inc. was contracted by Delcan Corporation of the City of Markham, Ontario, to conduct a cultural heritage assessment as part of a Transit Project Assessment Study for the Etobicoke-Finch West Light Rail Transit (LRT) Corridor from Humber College (North Campus) to Finch Subway Station in the City of Toronto, Ontario (Figure 1). The approximate length of the study corridor is 18 km. The project consists of developing a cost-effective surface transit alternative that would provide fast and frequent east-west service through the northern part of Etobicoke and North York.

The purpose of this report is to present an inventory of cultural heritage resources located in the study corridor. This research was conducted under the project direction of Rebecca A. Sciarra, Heritage Planner.

2.0 BUILT HERITAGE RESOURCE AND CULTURAL HERITAGE LANDSCAPE ASSESSMENT CONTEXT

2.1 Approach and Methodology

This cultural heritage assessment considers cultural heritage resources in the context of improvements to specified areas, pursuant to the *Environmental Assessment Act*. This assessment addresses above ground cultural heritage resources over 40 years old. Use of a 40 year old threshold is a guiding principle when conducting a preliminary identification of cultural heritage resources (Ministry of Transportation, 2006; Ministry of Transportation, 2007; Ontario Realty Corporation, 2007). While identification of a resource that is 40 years old or older does not confer outright heritage significance, this threshold provides a means to collect information about resources that may retain heritage value. Similarly, if a resource is slightly younger than 40 years old, this does not preclude the resource from retaining heritage value.

The proposed transit improvements have the potential to affect cultural heritage resources in a variety of ways. These include the loss or displacement of resources through removal or demolition and the disruption of resources by introducing physical, visual, audible or atmospheric elements that are not in keeping with the resources and/or their setting.

For the purposes of this assessment, the term cultural heritage resources was used to describe both cultural landscapes and built heritage resources. A cultural landscape is perceived as a collection of individual built heritage resources and other related features that together form farm complexes, roadscapes and nucleated settlements. Cultural landscapes also include natural environments that may not contain individual structures but reflect indelible impressions of human activity and planning. Built heritage resources are typically individual buildings or structures that may be associated with a variety of

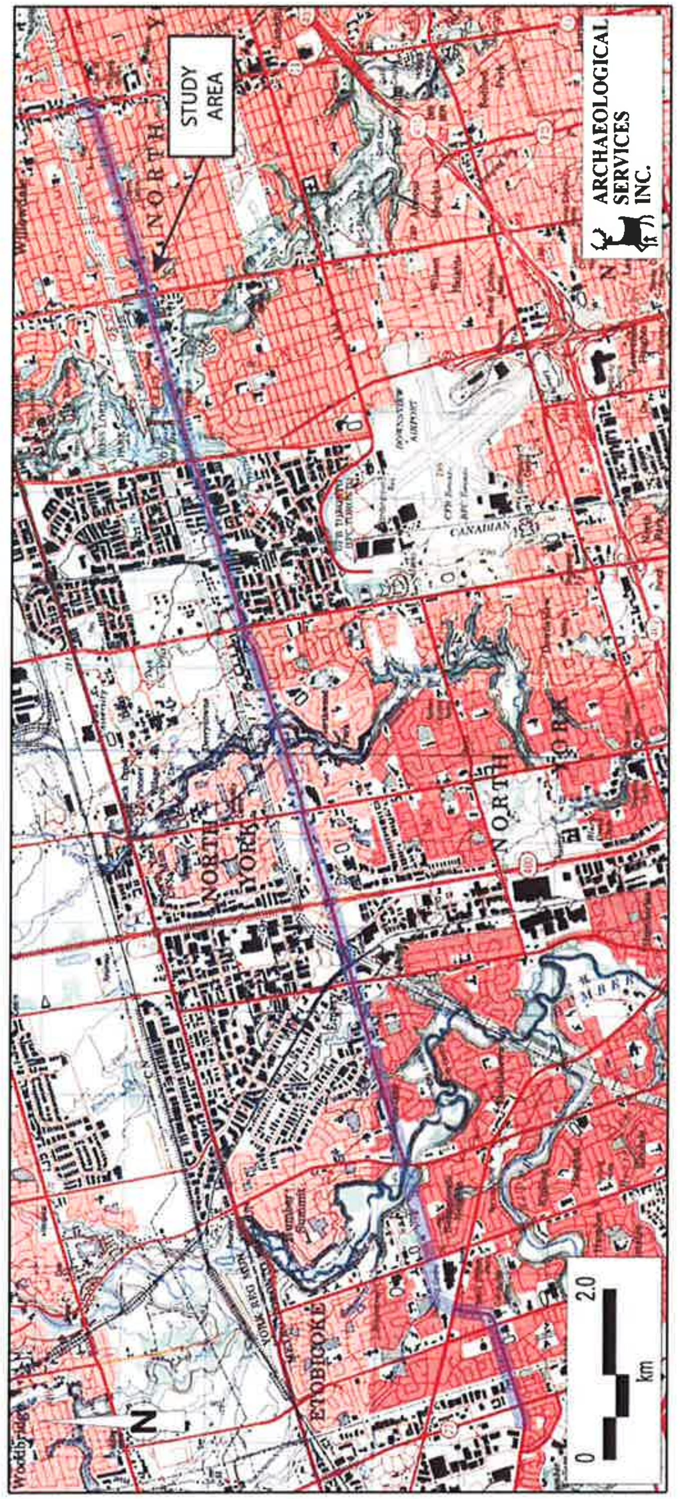

Figure 1: Location of study corridor in the City of Toronto (NTS Maps 30M11-14)

human activities, such as local and provincial historical themes, patterns of architectural development, and which contribute to the contextual aspects that constitute a particular community, neighbourhood, landscape, or intersection.

The analysis throughout the study process addresses cultural heritage resources under various pieces of legislation and their supporting guidelines. Under the *Environmental Assessment Act, environment* is defined in subsection 1(c) to include:

> Cultural conditions that influence the life of man or a community;

as well as,

> Any building, structure, machine or other device or thing made by man.

The Minister of Culture is charged under Section 2 of the *Ontario Heritage Act* with the responsibility to determine policies, priorities and programs for the conservation, protection and preservation of the heritage of Ontario and has published two guidelines to assist in assessing cultural heritage resources as part of an environmental assessment: *Guideline for Preparing the Cultural Heritage Resource Component of Environmental Assessments* (1992) and *Guidelines on the Man-Made Heritage Component of Environmental Assessments* (1980). Accordingly, both guidelines have been utilized in this assessment process.

The *Guidelines on the Man-Made Heritage Component of Environmental Assessments* states the following:

> When speaking of man-made heritage we are concerned with the works of man and the effects of his activities in the environment rather than with movable human artifacts or those environments that are natural and completely undisturbed by man.

In addition, environment may be interpreted to include the combination and interrelationships of human artifacts with all other aspects of the physical environment as well as with the social, economic and cultural conditions that influence the life of the people and communities in Ontario. The *Guidelines on the Man-Made Heritage Component of Environmental Assessments* distinguish between two basic ways of visually experiencing this heritage in the environment, namely as *cultural landscapes* and as *cultural features*.

Within this document *cultural landscapes* are defined as follows:

> The use and physical appearance of the land as we see it now is a result of man's activities over time in modifying pristine landscapes for his own purposes. A cultural landscape is perceived as a collection of individual man-made features into a whole. Urban cultural landscapes are sometimes given special names such as townscapes or streetscapes that describe various scales of perception from the general scene to the particular view. Cultural landscapes in the countryside are viewed in or adjacent to natural undisturbed landscapes, or waterscapes, and include such land-uses as agriculture,

> mining, forestry, recreation, and transportation. Like urban cultural landscapes, they too may be perceived at various scales: as a large area of homogenous character; or as an intermediate sized area of homogenous character or a collection of settings such as a group of farms; or as a discrete example of specific landscape character such as a single farm, or an individual village or hamlet.

A *cultural feature* is defined as the following:

> ...an individual part of a cultural landscape that may be focused upon as part of a broader scene, or viewed independently. The term refers to any man-made or modified object in or on the land or underwater such as buildings of various types, street furniture, engineering works, plantings and landscaping, archaeological sites, or a collection of such objects seen as a group because of close physical or social relationships.

Additionally, the *Planning Act* and related *Provincial Policy Statement (PPS)* make a number of provisions relating to heritage conservation. One of the general purposes of the *Planning Act* is to integrate matters of provincial interest in provincial and municipal planning decisions. In order to inform all those involved in planning activities of the scope of these matters of provincial interest, Section 2 of the *Planning Act* provides an extensive listing. These matters of provincial interest shall be regarded when certain authorities, including the council of a municipality, carry out their responsibilities under the *Act*. One of these provincial interests is directly concerned with:

> 2(d) the conservation of features of significant architectural, cultural, historical, archaeological or scientific interest...;

This provides the context not only for discrete planning activities detailed in the *Act* but also for the foundation of policy statements issued under Section 3 of the *Act*.

The *PPS* indicates in IV. Implementation/Interpretation that:

> 4.5 The official plan is the most important vehicle for implementation of this Provincial Policy Statement.
>
> Comprehensive, integrated and long-term planning is best achieved through municipal official plans. Municipal official plans shall identify provincial interests and set out appropriate land use designations and policies. Municipal official plans should also coordinate cross-boundary matters to complement the actions of other planning authorities and promote mutually beneficial solutions.
>
> Municipal official plans shall provide clear, reasonable and attainable policies to protect provincial interests and direct development to suitable areas.

Those policies of particular relevance for the conservation of heritage features are contained in Section 2, *Wise Use and Management of Resources*, in which the preamble states that "Ontario's long-term prosperity, environmental health, and social well-being depend on protecting natural heritage, water, agricultural, mineral and cultural heritage and archaeological resources for their economic, environmental and social benefits."

Accordingly, in subsection 2.6, *Cultural Heritage and Archaeological Resources*, makes the following provisions:

> 2.6.1 Significant built heritage resources and cultural heritage landscapes shall be conserved.

A number of definitions that have specific meanings for use in a policy context accompany the policy statement. These definitions include built heritage resources and cultural heritage landscapes (*PPS* 2005):

> *Built heritage resources* mean one or more buildings, structures, monuments, installations or remains associated with architectural, cultural, social, political, economic, or military history, and identified as being important to a community.
>
> *Cultural heritage landscapes* mean a defined geographical area of heritage significance that has been modified by human activities. Such an area is valued by a community, and is of significance to the understanding of the history of a people or place. Examples include farmscapes, historic settlements, parks, gardens, battlefields, mainstreets and neighbourhoods, cemeteries, trailways, and industrial complexes of cultural heritage value.

In addition, *significance* is also more generally defined. It is assigned a specific meaning according to the subject matter or policy context, such as wetlands or ecologically important areas. With regard to cultural heritage and archaeology resources, resources of significance are those that are valued for the important contribution they make to our understanding of the history of a place, an event, or a people (*PPS* 2005).

Criteria for determining significance for the resources are recommended by the Province, but municipal approaches that achieve or exceed the same objective may also be used. While some significant resources may already be identified and inventoried by official sources, the significance of others can only be determined after evaluation (*PPS* 2005).

These policy provisions will be considerations in this heritage assessment.

2.2 Data Collection

In the course of the cultural heritage assessment, all potentially affected cultural heritage resources within the study corridor are subject to inventory. Short form names are usually applied to each resource type, (e.g. barn, residence). Generally, when conducting a preliminary identification of cultural heritage resources, three stages of research and data collection are undertaken to appropriately establish the potential for and existence of cultural heritage resources in a particular geographic area.

Background historic research, which includes consultation of primary and secondary source research and historic mapping, is undertaken to identify early settlement patterns and broad agents or themes of change in a study area. This stage in the data collection process enables the researcher to determine the presence

of sensitive heritage areas that correspond to nineteenth century settlement patterns. To augment data collected during this stage of the research process, federal, provincial, and municipal databases and/or agencies are consulted to obtain information about specific properties that have been previously identified and/or designated as retaining cultural heritage value. Typically, resources identified during these stages of the research process are reflective of particular architectural styles, associated with an important person, place, or event, and contribute to the contextual facets of a particular place, neighbourhood, or intersection.

A field review is then undertaken to confirm the location and condition of previously identified cultural heritage resources. The field review is also utilized to identify cultural heritage resources that have not been previously identified on federal, provincial, or municipal databases. Several investigative criteria are utilized during the field review to appropriately identify new cultural heritage resources. These investigative criteria are derived from provincial guidelines, definitions, and past experience. A built structure or landscape is identified as a cultural heritage resource that should be considered during the course of the environmental assessment, if the resource meets at least two of the following criteria:

- It is 40 years or older;
- It is a rare, unique, representative or early example of a style, type, expression, material or construction method;
- It displays a high degree of craftsmanship or artistic merit;
- It demonstrates a high degree of technical or scientific achievement;
- The site and/or structure retains original stylistic features and has not been irreversibly altered so as to destroy its integrity;
- It has a direct association with a theme, event, belief, person, activity, organization, or institution that is significant to: the City of Toronto; the Province of Ontario; Canada; or the world heritage;
- It yields, or had the potential to yield, information that contributes to an understanding of: the City of Toronto; the Province of Ontario; Canada; or the world heritage;
- It demonstrates or reflects the work or ideas of an architect, artist builder, designer, or theorist who is significant to: the City of Toronto; the Province of Ontario; Canada; or the world heritage;
- It is important in defining, maintaining, or supporting the character of an area;
- It is physically, functionally, visually, or historically linked to its surroundings;
- It is a landmark;
- It illustrates a significant phase in the development of the community or a major change or turning point in the community's history;
- The landscape contains a structure other than a building (fencing, culvert, public art, statue, etc.) that is associated with the history or daily life of that area or region;
- There is evidence of previous historic and/or existing agricultural practices (e.g. terracing, deforestation, complex water canalization, apple orchards, vineyards, etc.)

If a resource satisfies an appropriate combination of these criteria, it will be identified as a cultural heritage resource and is subject to further research where appropriate and when feasible. Typically, further historical research and consultation is required to determine the specific significance of the identified cultural heritage resource.

When identifying cultural heritage landscapes, the following categories are typically utilized for the purposes of the classification during the field review:

Farm complexes:	comprise two or more buildings, one of which must be a farmhouse or barn, and may include a tree-lined drive, tree windbreaks, fences, domestic gardens and small orchards.
Roadscapes:	generally two-lanes in width with absence of shoulders or narrow shoulders only, ditches, tree lines, bridges, culverts and other associated features.
Waterscapes:	waterway features that contribute to the overall character of the cultural heritage landscape, usually in relation to their influence on historic development and settlement patterns.
Railscapes:	active or inactive railway lines or railway rights of way and associated features.
Historical settlements:	groupings of two or more structures with a commonly applied name.
Streetscapes:	generally consists of a paved road found in a more urban setting, and may include a series of houses that would have been built in the same time period.
Historical agricultural Landscapes:	generally comprises a historically rooted settlement and farming pattern that reflects a recognizable arrangement of fields within a lot and may have associated agricultural outbuildings and structures
Cemeteries:	land used for the burial of human remains.

Results of the field review are contained in Section 3; while Sections 4 and 5 contain conclusions and recommendations with respect to potential disruptions and displacements of identified heritage resources pertaining to the Etobicoke-Finch West LRT Corridor Class EA study.

3.0 BUILT HERITAGE RESOURCE AND CULTURAL HERITAGE LANDSCAPE ASSESSMENT

3.1 Introduction

This section provides the results of historical research and a description of identified above ground cultural heritage resources that may be affected by the proposed Etobicoke-Finch West LRT Corridor, located in the City of Toronto, Ontario. A brief review of available primary and secondary source material was undertaken to produce a contextual overview of the study area, including a general description of Euro-Canadian settlement and land-use, and the development of transportation infrastructure.

Historically, the study corridor resides in the former Townships of York and Etobicoke, in the County of York. More specifically, the study corridor traverses Concessions A and 1 to 3 in Etobicoke Township on part of Lots 35 and 36. Moving in an easterly direction, the study corridor continues along the road allowance between Lots 20 and 21 through Concessions 1 to 7, West of Yonge Street (WYS), and ends at Concession 1, East of Yonge Street (EYS), on part of Lots 20 and 21 in York Township.

3.2 Historical Land Use Summary

3.2.1 Etobicoke Township

The land in Etobicoke Township was acquired by the British from the native Mississaugas as part of the Toronto Purchase of September 25, 1787. The township was originally under the authority of the Nassau District Land Board which sat at Newark (Niagara) until the district boards were abolished by John Graves Simcoe in November 1794. When Simcoe redefined the administrative and electoral boundaries for Upper Canada, the area which covers the modern City of Toronto and also Etobicoke formed part of the County of York in the East Riding of York in the Home District.

The first survey of Etobicoke was made by Abraham Iredell in April 1795, with the first "legal settler" taking up land in 1800 (Armstrong 1985:143). Several of the modern streets in Etobicoke follow the survey lines set down by Iredell, and his field notes were used by William Hawkins (PLS) when he corrected and confirmed parts of the township survey in 1856-7. Other parts of Etobicoke, such as the extensive tract in the south-west corner of the township which was granted to the Hon. Samuel Smith, remained unsurveyed until this work was undertaken by Samuel Wilmot in 1811 (Hawkins 1857). Other early township surveys were undertaken by Augustus Jones (1797) and Hambly (1798). A survey of a road leading across the township to the King's Mill was undertaken by Ridout and some soldiers from the garrison at York during the summer of 1814. The irregular shape of the township, as well as the various surveyors who laid out the concessions, caused Etobicoke to be "laid out in a fragmentary and unsystematic fashion" (Robinson, 1885 vol. 1: 97). Canniff also speculated that part of the haphazard survey found in Etobicoke may have been in an effort to permit as many settlers as possible to "obtain a frontage upon a water way" (Miles & Co 1878:xxi).

The population of the township in 1842 had reached 2,467. In 1846, Etobicoke was described as "a well settled township, containing good land" although some of the land near the lake was "generally poor and sandy." The township contained five grist mills and nine sawmills (Smith 1846:57). In 1850, the township of Etobicoke was incorporated, and the population had reached 2904. In 1881, the population was 2976.

In 1967, Etobicoke Township, Mimico, New Toronto, and Long Branch amalgamated to form the borough of Etobicoke, which was elevated to city status in 1983 (Rayburn 1997:115).

3.2.2 York Township

The history of York Township as a territorial division began in 1791 when Augustus Jones surveyed the township. The first land patents were granted in 1796 and by 1813 all of the township lands had been parcelled. By 1802 the township, bounded by the Humber River and Etobicoke Township to the west and sharing a border with Scarborough Township to the east, had a grist mill, two saw mills and two taverns. In 1801 the combined population of York, Etobicoke and Scarborough Townships and the Town of York numbered only 678 but by 1840 the population of York Township numbered more than 5,000 and an economic boom during the 1850s helped to triple the population. This required the growing urban area to stretch its northern limits from Queen Street to Bloor Street. Outside of the core of the city, especially north along Yonge Street, Yorkville (above Bloor) was a prosperous village and some Torontonians settled between Bloor and Eglinton as new street railway services improved suburban to urban access.

In its first 30 years, York Township (as differentiated from the Town of York) was a rolling and well wooded countryside. The centre of the township was present day Yonge Street and Eglinton Avenue or Eglinton Village. Eglinton Avenue, which was surveyed as the township's baseline, was at that time known as Baseline Road, and the crossroads community had a number of services including four hotels and a Masonic Hall. Yonge Street was settled on both sides and one mile south of Eglinton Avenue, the Davis family ran a pottery business (in the community later known as Davisville). A large number of suburban residences were constructed along the Davenport Ridge, an early Aboriginal trail. Villages in the township and their years of incorporation included Yorkville (1884) and North Toronto (Eglinton and Davisville combined, 1889). The villages of Riverdale, Rosedale, the Annex, Seaton Village and Sunnyside were all annexed directly to Toronto during the 1880s. The annexation of East Toronto occurred in 1908.

The evolution of the city continued at an even greater pace through the late nineteenth and early twentieth centuries, with the consolidation of rail systems and the growth of numerous industrial and commercial operations within the city limits and along the rail corridors. Urban planning became more coordinated in the twentieth century, and a move toward more spatial control was made in 1904 with legislation that controlled non-residential land use in the city. This was soon applied to residential areas, as municipal officials attempted to alleviate certain kinds of congestion and undesirable overlap. The development of internal urban transport also promoted a wider spread community and the establishment of discrete business and residential districts.

Throughout the rest of the city, economic prosperity and urban opportunity drew people to various parts of the city to live and work. Industrial districts followed the railway lines, and new immigration and more land annexation, including North Toronto and Moore Park in 1912, resulted in strong population growth. The geographic area of the city doubled between 1891 and 1912, and the population grew from 181,000 to 378,000 during the same period. During the 1920s, a dramatic economic boom fueled the construction of new office towers – a total of 14 between 1922 and 1928. Increased automobile use necessitated improvements to local roads and crossings.

Few new buildings were constructed during the 1930s depression, and unemployment remained high until the war economy lifted companies up and out of their downturns. Before the war ended, a post-war reconstruction plan was put together for the city, and this represented the first overall approach to urban planning since Governor Simcoe envisioned plans for York in 1793. Residential lots were divided and subdivided as the city's density increased, new office buildings and manufacturing plants filled in open spaces, and public transportation networks were expanded.

3.3 Review of Historic Mapping

The study corridor is located on part of Lots 35 and 36, Concessions 1, 1-3, in the former Township of Etobicoke and on part of Lots 20 and 21, Concession 1-7 (WYS) and Concession 1 (EYS), in the former Township of York. The 1860 *Tremaine's Map of the County of York* (Figure 2a and 2b) and the 1878 *Illustrated Historical Atlas of the County of York* (Figure 3a and 3b) illustrates the following features within the study corridor: property owners; houses; orchards; post offices; schools; churches; saw mills; grist mills; railways; roads; and historic communities that include Smithfield, York Station and Elias. Some of these features are still present today, the most visible being the road and railroad alignments. It should be noted, however, that not all features of interest were mapped systematically in the Ontario series of historical atlases, given that they were financed by subscription, and subscribers were given preference with regard to the level of detail provided on the maps. Moreover, not every feature of interest would have been within the scope of the historic mapping. The following section provides a description of features identified through historic mapping.

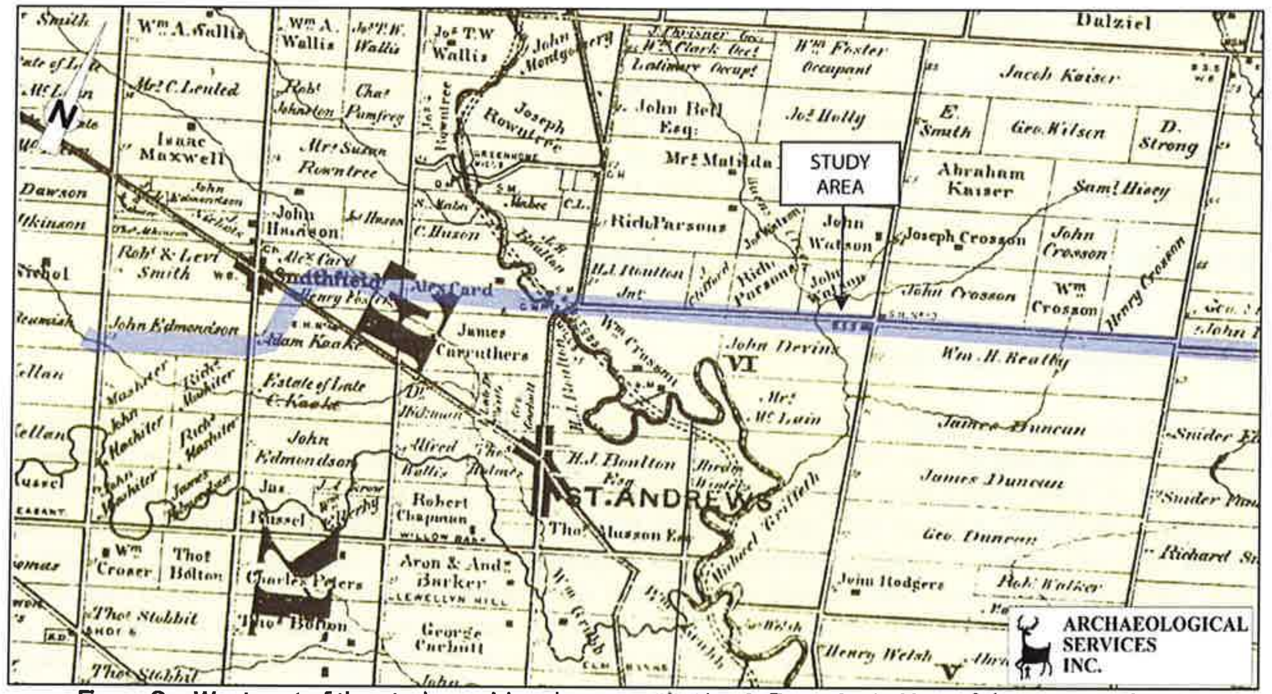

Figure 2a: West part of the study corridor shown on the 1860 *Tremaine's Map of the County of York*

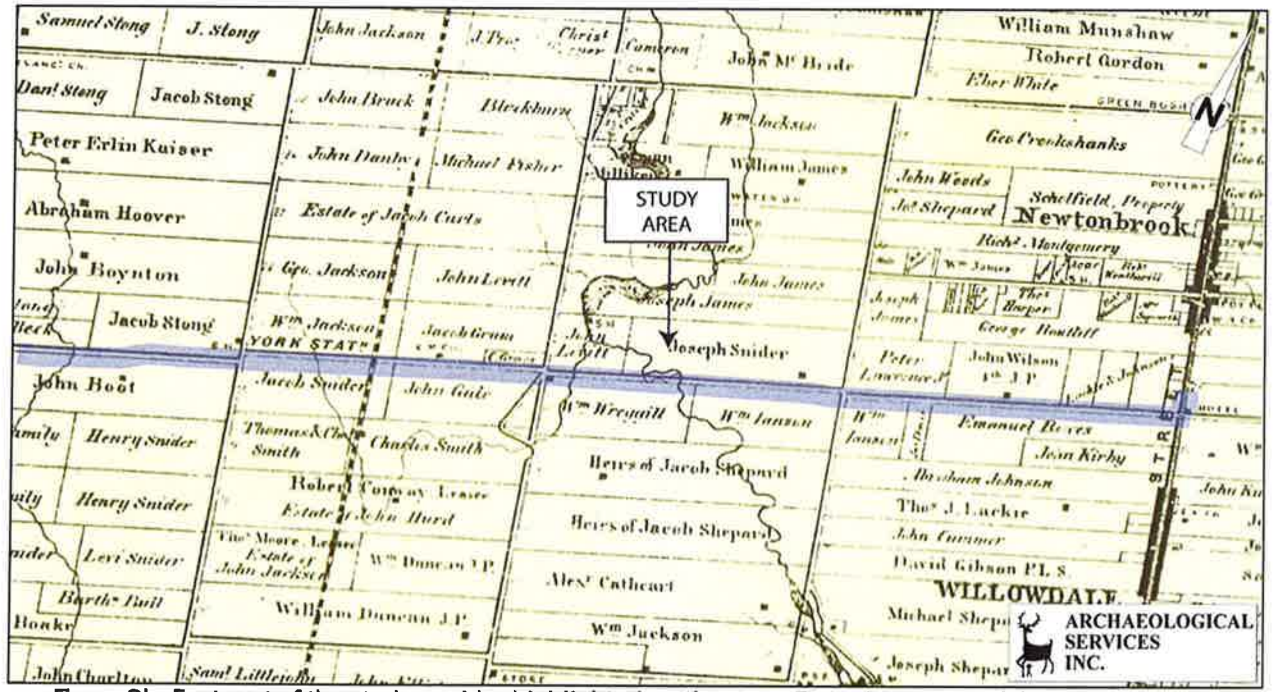

Figure 2b: East part of the study corridor highlighted on the 1860 *Tremaine's Map of the County of York*

3.3.1 Western Section

The western part of the study corridor begins in the former Etobicoke Township at the intersection of Finch Ave W and Woodbine Downs Blvd, thence moving easterly along the current road alignment of Finch Ave W into the former York Township. The western section ends midway between Jane St and Keele St. The Toronto Grey & Bruce Railway bisects this portion of the study area. This section of the study corridor traverses a number of major cross-roads, including Highway 27, Martin Grove Rd, Kipling Ave, Islington Ave, Weston Road, Highway 400 and Jane St. Most of these roads continue to follow the alignment of the original roads as depicted in the 1860 and 1878 historic mapping, with the exception of Highway 400. Finch Ave W itself is a historically surveyed thoroughfare. The Humber River cuts across this section of the study corridor, at approximately the Finch Ave W and Islington Ave intersection. The Humber River is a major watercourse that influenced nineteenth century early patterns as can be seen on historic mapping, and as such can be considered an indicator of an area with potential for cultural heritage resources, and may be considered a heritage resource itself. Similarly, Black Creek can be considered a historic waterscape given that a number of farmsteads emerged in very close proximity to this watercourse.

Table 1 lists information concerning the historical features and property owners/residents, as found on the 1860 and 1878 historic mapping (Figures 2a and 3a), and which are located within the western section of the study corridor. The illustrated historical features consist mostly of farmsteads, but also include schools, churches and mills. This portion of the study corridor does not pass through any hamlets, although it does reside in the vicinity of Smithfield, which developed at the intersection of Albion Rd and Martin Grove Rd. A small cross-roads community appears to have developed around the intersection of Weston Rd and Finch Ave W, however, it does not carry a name. The community included a number of buildings along the Weston and Finch road alignments, including a Methodist Church, School House No.19, and a building referred to as "B.S.S." By 1871, the Toronto Grey and Bruce Railway had constructed a line that passed to the north and east of this intersection.

A burial place known as the 'Yorkshireman's Grave' is known to have existed somewhere on lot 20, Concession 4, WYS. It is not clear whether a single burial was made here or multiple unmarked burials. It was recorded in August 1993 in the Ontario Genealogical Society's database of "abandoned" cemeteries (OGS printout Y5300).[1]

3.3.2 Eastern Section

The eastern part of the study corridor begins midway between Jane St and Keele St, travelling easterly along the road alignment of Finch Ave. E to Yonge Street, at which point it briefly travels in a northerly direction, ending at Finch Subway Station. There are a number of roads which traverse the study corridor which continue to follow the alignment of the original roads depicted in historic mapping. These include: Finch Ave W; Keel St; Dufferin St; Bathurst St and Yonge St. The Northern Railway bisects this part of the study corridor.

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[1] For the data information sheet of Marjorie Stewart which recorded the existence of this burial spot see Archives of Ontario microfilm MS451 reel 136.

Table 1 lists information concerning the historical features and property owners/residents, as found on the 1860 and 1878 historic mapping (Figures 2b and 3b), and which are located within the eastern section of the study corridor. The historical features illustrated consist mostly of farmsteads, but also include schools, churches, a post office, and a mill.

The historic community of York Station, later Elia, falls within this part of the study corridor, which developed around the intersection of Keele St and Finch Ave W. The original lot owners in 1800 were mostly members of the Queen's Rangers, who accompanied Governor Simcoe from Niagara to York in 1793. The property was later sold to Pennsylvania German settlers (Hart 1968:213). The community of Elia contained two blacksmith shops, a saw mill, a grist mill, a general store, a post office, an Episcopal Methodist Church, a log school house which was replaced by a brick school in 1873, and the Canadian Order of Foresters Hall. Today, the church stands alone surrounded by huge oil tanks (Hart 1968: 218).

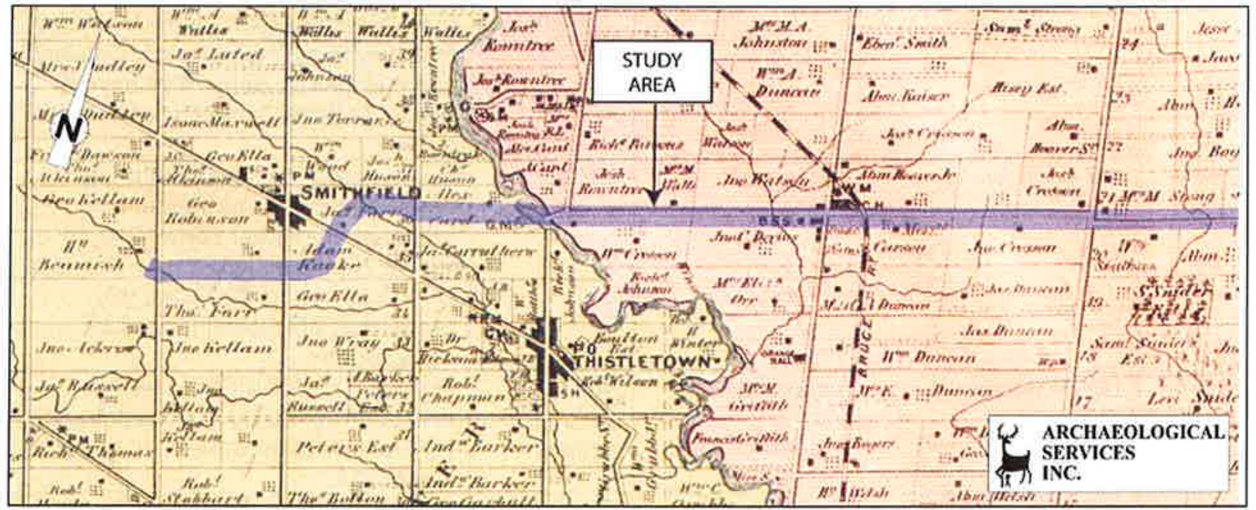

Figure 3a: West part of the study corridor shown on the 1878 Historical Atlas of the County of York

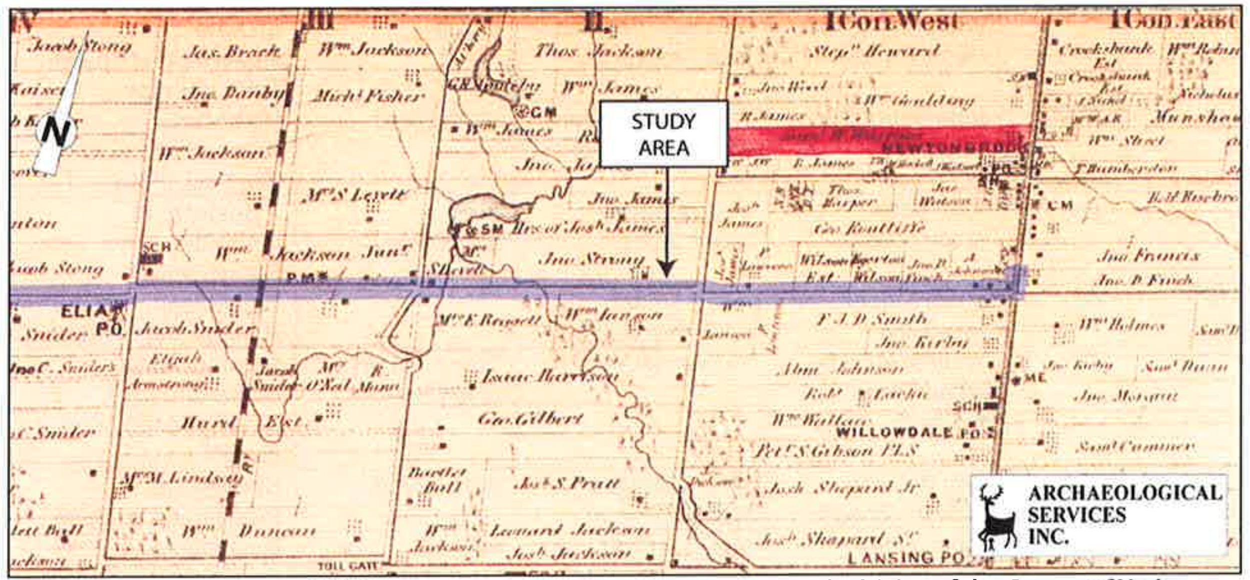

Figure 3b: East part of the study corridor shown on the 1878 Historical Atlas of the County of York

Table 1: Property Owner(s)/Resident(s) and Historical Feature(s) Illustrated Within or Adjacent to the Study Corridor

Twp of Etobicoke		Owner(s)/Resident(s)		Feature(s)	
Con. #	**Lot #**	**1860**	**1878**	**1860**	**1878**
III	35	Beamish	H. Beamish		Homestead, orchard
II	35	John Edmondson	Thomas Farr		Homestead, orchard
I	35	Adam Koake	Adam Faake		2 Homesteads, orchard
A	36	Henry Foster	Jason Farr		Homestead
A	36	Alex Card	Alex Card	Homestead, gristmill	Homestead, orchard, grist mill
Twp of York, West of Yonge St					
Con. #	**Lot #**				
VII	21	J.H. Boulton	Alex Card	Saw mill, **"Boultons Mills"**	Homestead, orchards
VI	20	William Crosson John Devins	William Crosson J. Devins	Homestead B.S.S (store?)	2 Homesteads, orchard 1 Homestead, orchard B.S.S. & several buildings along the road allowance
	21	H.J. Boulton Jr J. Clifford John Watson	Josh Rowntree Mrs. M. Walts J. Watson		Homestead Homestead
V	20	William H. Beatty	Isaac Kerns M. Carson Jonathan Crosson		Homestead, orchard Homestead
	21	John Crosson	Abraham Hoover Jr.	School House	2 Homesteads,

		William Crosson Herny Crosson	Jonathan Crosson Josh Crosson	No.10	orchard W. Methodist Church School House
IV	20	John Boot	William Smithson Abraham Snider	Homestead	Homestead Homestead, orchards Elia Post Office
	21	John Beck Jacob Stong	Mrs. M. Stong Jacob Stong	School House	2 Homestead, orchards Homestead
III	20	Jacob Snider John Gule	Jacob Snider William Jackson Jr.		Homestead, orchard Homestead, orchard
	21	William Jackson Jacob Gram C. Gram	William Jackson Jr.	"York Station" C. M Church	4 Homesteads, orchard, school, Primitive Methodist church
II	20	Wm Wreggitt William Ianson	Mrs. E. Reggett William Ianson	Homestead	Homestead Homestead, orchard
	21	John Levitt Joseph Snider	Mrs. S. Levett Jonathan Strong	Sawmill Homestead	Homestead Homestead, orchard
I	20	William Ianson J. Davis Emanuel Bowes	William Ianson P. Lawrence F.J.D. Smith		3 Homesteads, orchard
	21	Peter Lawrence Jr. John Wilson, J.P. Lackle & Johnson	J. James P. Lawrence Wilson Estate Egerton Wilson J. D. Finch A. Johnson	Homestead	Homestead 3 homesteads
Twp of York, East of Yonge St					
I	20	Wm. Holmes	William Holmes	Homestead	Homestead, orchard
	21		Jonathan D. Finch Jonathan Francis	Hotel (NE corner of Yonge & Finch)	Homestead, orchard Homestead

3.4 Existing Conditions

In order to determine the existence of previously identified cultural heritage resources in the study area, the Ministry of Culture's Ontario Heritage Properties Database and the City of Toronto's Inventory of Heritage Properties were consulted in order to collect relevant information. This part of the data collection process revealed that a small number of mid to late nineteenth century and early twentieth century features have been previously recognized for their heritage significance, either through *Ontario Heritage Act* designation or via municipal 'listing'. A field review was then conducted by Rebecca Sciarra, Heritage Planner at ASI, in June 2009 to confirm the location and condition of previously identified resources and to identify additional features of potential cultural heritage interest.

Table 2 lists all of the cultural heritage resources that have been identified within the Etobicoke-Finch West LRT Corridor study area. Appendix A provides study area mapping illustrating the location of identified features. Appendix B provides an individual description of each feature.

Table 2: Identified Built Heritage Resources (BHR) and Cultural Heritage Landscapes (CHL) within the Study Corridor

Feature	Location	Feature Type	Age	Description/Comments
BHR-1	1130 Finch Ave W	Church and Cemetery	1901	Elia Episcopal Church and Cemetery, Designated (By-law: 31873). The burial grounds are also known as Gram's Appointment Church Cemetery. 1832 is the earliest marker recorded and is now inactive.
BHR-2	685 Finch Ave W	Church	1928	A listed property, which includes a detached house and rectory, is referred to as "Shadowbrook" in the Inventory. Also known as "St. Bernard's Convent", and includes St. Bernard's Convent Roman Catholic Cemetery, established in 1961.
BHR-3	172 Finch Ave W	Residence	1920s	It is reported (Apr 24/07) that City Council intends to designate this property: the Arthur Edward Waine House. Heritage Preservation Services confirmed in June 2009 that this property is still recommended for designation.
BHR-4	1125 Finch Ave W	Industrial	Mid-twentieth century	Identified during the field review. Functions as factory and headquarters for 'Open Window Bakery', in operation since 1957.
BHR-5	5600 Finch Ave W	Commercial	Ca. 1920-1930	Identified during the field review. This 2 storey brick structure likely originally served as a bank or utility building at the southwest corner of Finch Ave W and Yonge St.
CHL-1	Humber River	Waterscape		Identified on historic mapping.
CHL-2	Between 400 and Weston	Railscape	1853	Currently operated by Canadian National. 1860 Map: Northern Railway 1878 Map: Northern Railway Built in 1853 by Northern Railway to connect Toronto with Collingwood. (Andreae 1997)
CHL-3	Black Creek	Waterscape		Identified on historic mapping.
CHL-4	Between Dufferin and Keele	Railscape	1871	1860 Map: not present 1878 Map: Toronto, Grey & Bruce Railway. Built in 1871 by Toronto, Grey

Table 2: Identified Built Heritage Resources (BHR) and Cultural Heritage Landscapes (CHL) within the Study Corridor

				& Bruce. Currently operated by Canadian Pacific. (Andreae 1997)
CHL-5	Dufferin Creek	Waterscape		Identified on historic mapping.
CHL-6	Don River West Branch	Waterscape		Identified on historic mapping.
CHL-7	North and south side of Finch Ave W; Endell Street to Edithvale Drive	Mid-twentieth century transitional, residential streetscape	Mid-twentieth century	Identified during the field review. This portion of the Finch Ave right-of-way is anchored by a residential streetscape that is predominantly reflective of circa 1940s-1950s residential development. In the vicinity of Senlac Rd, two earlier, circa 1920s residences are located on the north side of the right of way, which help illustrate twentieth century transitions in the built form along this portion of Finch Ave, coinciding with the creation of North York.

4.0 CONCLUSIONS

Historic research revealed that the study corridor has origins in nineteenth century survey and settlement and has been substantially altered by urbanization. However, this is not to say that the study corridor does not retain a select number of cultural heritage resources. While significant traces to mid nineteenth century settlement patterns have largely diminished in the study corridor, vestiges are still present amidst a wider array of built forms and landscapes that are associated with early urban development patterns in the City of Toronto generally and Etobicoke and North York specifically. The following is a summary of the structures and cultural landscapes of heritage interest that have been identified within the study corridor:

- A total of five built heritage resources and seven cultural heritage landscapes were identified in the study corridor. These features include one church and cemetery (BHR 1), one church and rectory (BHR 2), one residence (BHR 3), one industrial building (BHR 4), one former public utility building (BHR 5), four waterscapes (CHL 1, CHL 3, CHL 5, and CHL 6), two waterscapes (CHL 2 and CHL 4), and one mid twentieth century residential streetscape (CHL 7);

- One resource located within the study corridor has been designated under the *Ontario Heritage Act* (BHR 1);

- Thee properties have been listed on the City of Toronto's Heritage Property Inventory (BHR 1, BHR 2, and BHR 3);

- One property is currently recommended for designation under the *Ontario Heritage Act* (BHR 3); and

- Two built heritage resources (BHR 4 and BHR 5) and seven cultural heritage landscapes (CHL 10-7) were identified through a combination of historic mapping, field review techniques, contextual contribution of the feature, and documented architectural or material detailing.

5.0 RECOMMENDATIONS

Proposed transit improvements within the Etobicoke-Finch West LRT study corridor can have a variety of impacts upon identified cultural heritage resources. These include the loss or displacement of resources through removal or demolition and the disruption of resources by introducing physical, visual, audible or atmospheric elements that are not in keeping with the resources and/or their setting.

Based on the results of background data collection and a field review and following a review of available design drawings (Figure 4), the following mitigation measures are recommended:

- The proposed light rail transit infrastructure should be designed so as to avoid identified cultural heritage resources. Where loss or displacement is expected, further research should be undertaken to evaluate the impacted feature's specific cultural heritage significance. Based on the results of evaluation, appropriate mitigation measures should be developed;

- Based on a preliminary review of design plans (Figure 4), ASI understands that one feature may be indirectly impacted (BHR 3) to accommodate construction of a stop facility. A review of preliminary design drawings indicates that construction of a stop facility in this area may result in a reduced buffer zone between the structure and the road right-of-way and potential visual impacts. Given that this structure is listed on the City of Toronto's Heritage Properties Inventory and has been recommended for designation under the *Ontario Heritage Act,* a heritage impact study is recommended. This study should consider the site's known or potential cultural heritage value and identify proposed impacts and develop appropriate mitigation measures to ensure the long-term conservation of the structure; and

- Based on a preliminary field review of the study corridor, indirect impacts to cultural heritage resources via introduction of visual, audible, and/or atmospheric elements associated with light rail transit are not a concern from a cultural heritage point of view. With the exception of BHR 1, all of the identified resources that would be subject to introduction of such elements were constructed during the twentieth century and are contextually congruent with a modern transit corridor. Indirect impacts to BHR 1, via introduction of audible and atmospheric elements associated with light rail transit infrastructure, are considered negligible given that Finch Avenue West currently functions as a high traffic arterial road in the vicinity of this structure.

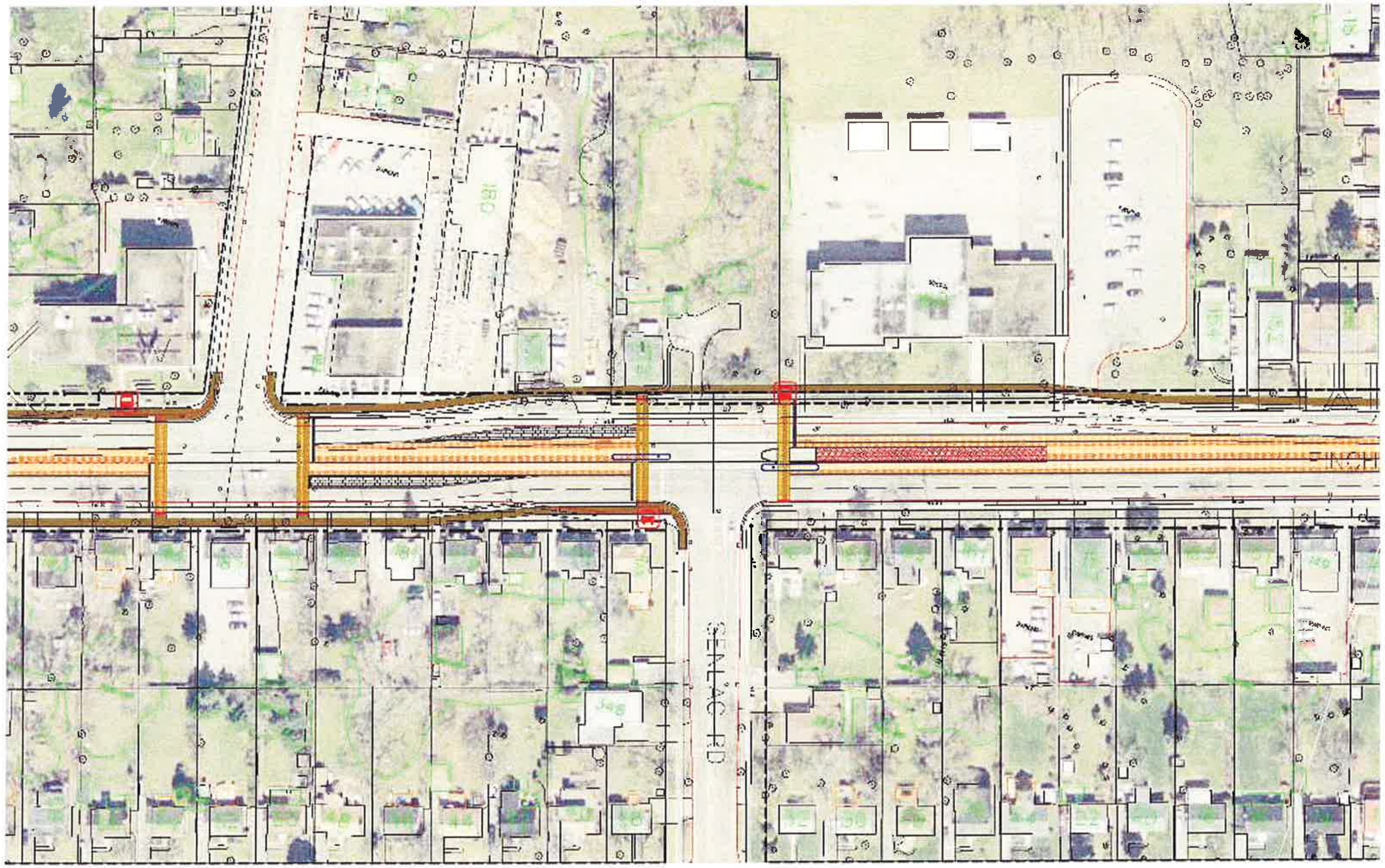

Figure 4: Preliminary and proposed design for stop facility in the vicinity of 172 Finch Avenue West (August 2009).

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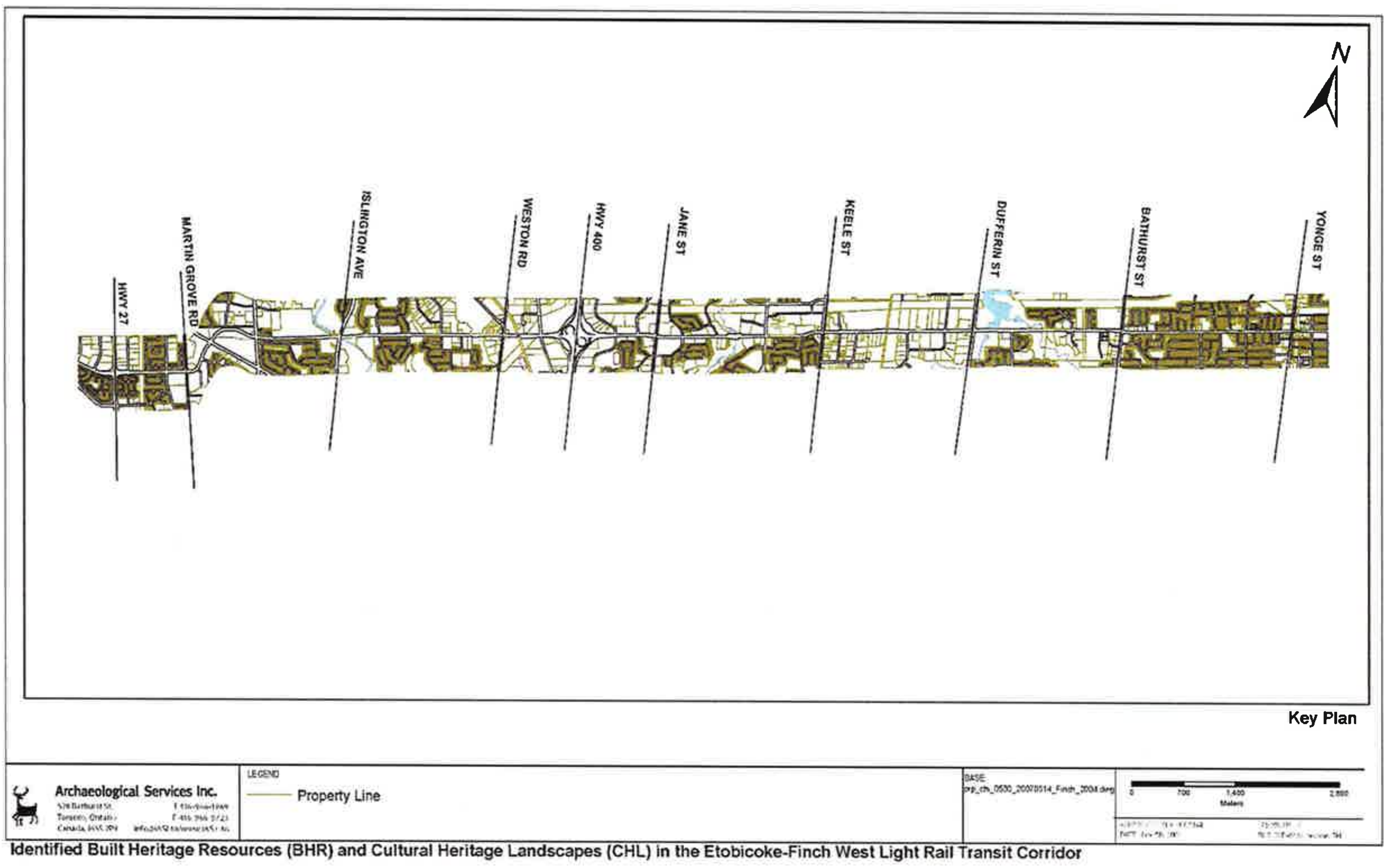
APPENDIX A:

Built Heritage Resource and Cultural Heritage Landscape Mapping

Etobicoke-Finch West Light Rail Transit Corridor
Humber College (North Campus) to Finch Subway Station
Transit Project Assessment Study, City of Toronto, Ontario



Identified Built Heritage Resources (BHR) and Cultural Heritage Landscapes (CHL) in the Etobicoke-Finch West Light Rail Transit Corridor

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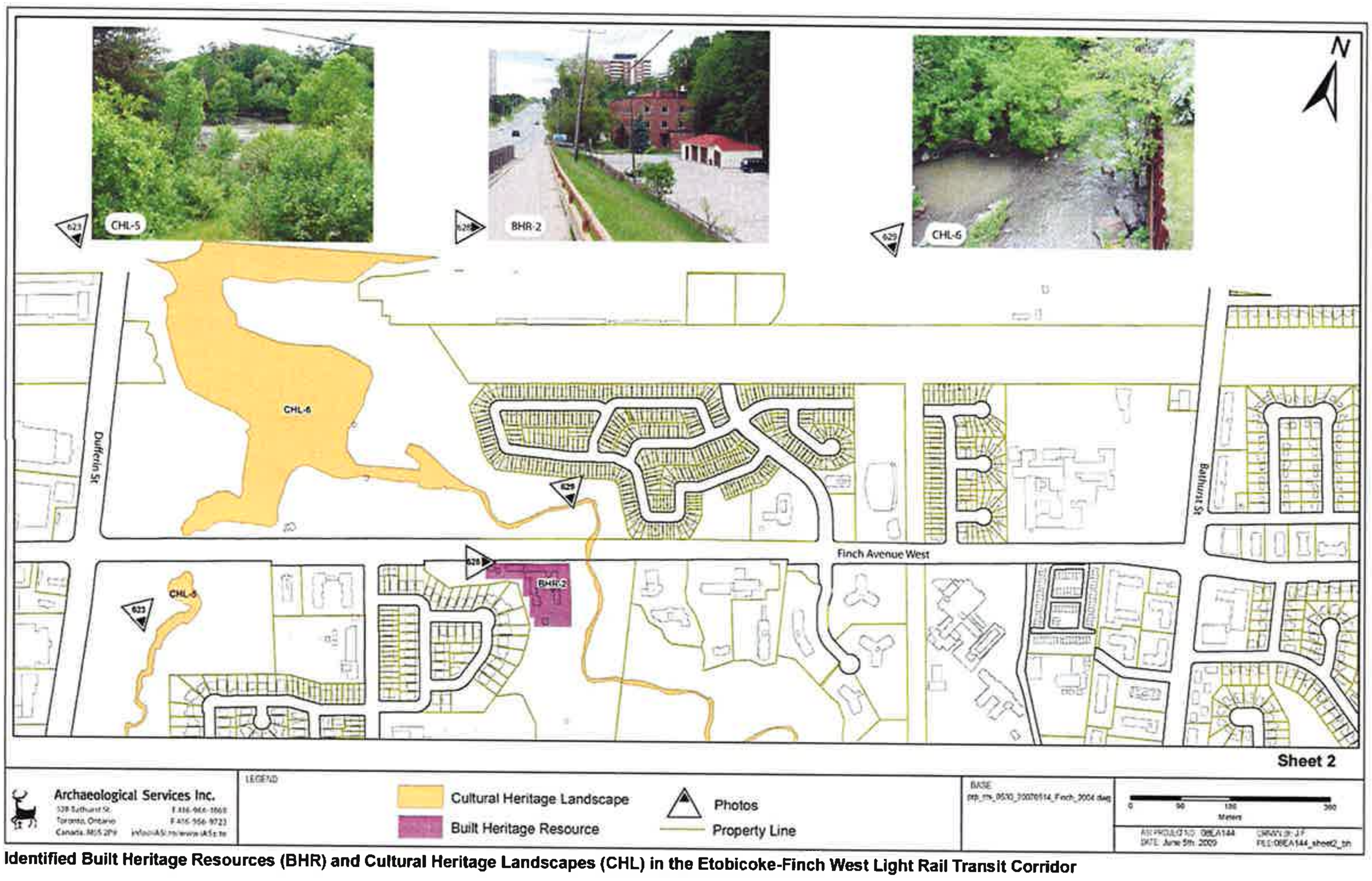
Identified Built Heritage Resources (BHR) and Cultural Heritage Landscapes (CHL) in the Etobicoke-Finch West Light Rail Transit Corridor



Identified Built Heritage Resources (BHR) and Cultural Heritage Landscapes (CHL) in the Etobicoke-Finch West Light Rail Transit Corridor

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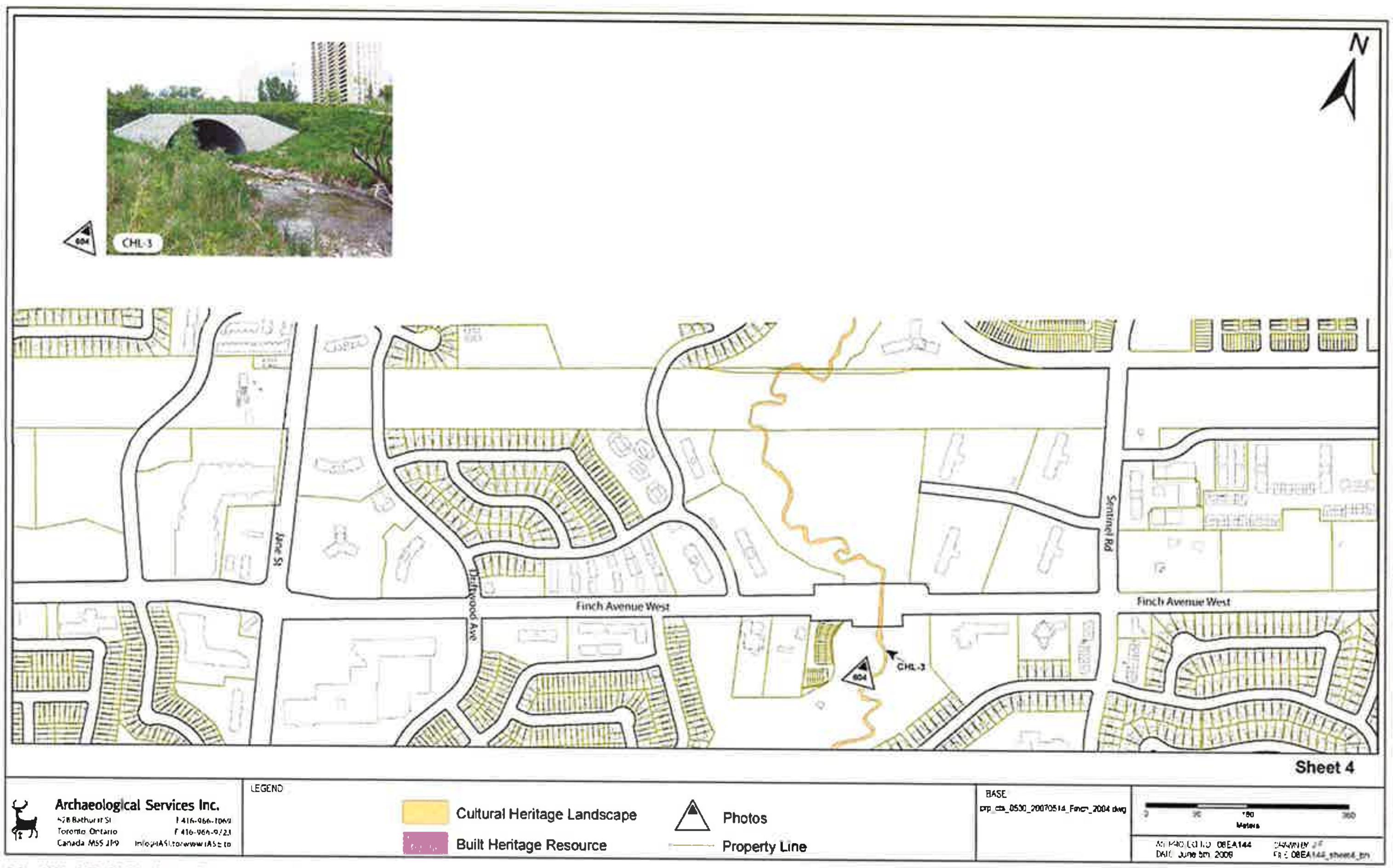
Identified Built Heritage Resources (BHR) and Cultural Heritage Landscapes (CHL) in the Etobicoke-Finch West Light Rail Transit Corridor



Identified Built Heritage Resources (BHR) and Cultural Heritage Landscapes (CHL) in the Etobicoke-Finch West Light Rail Transit Corridor

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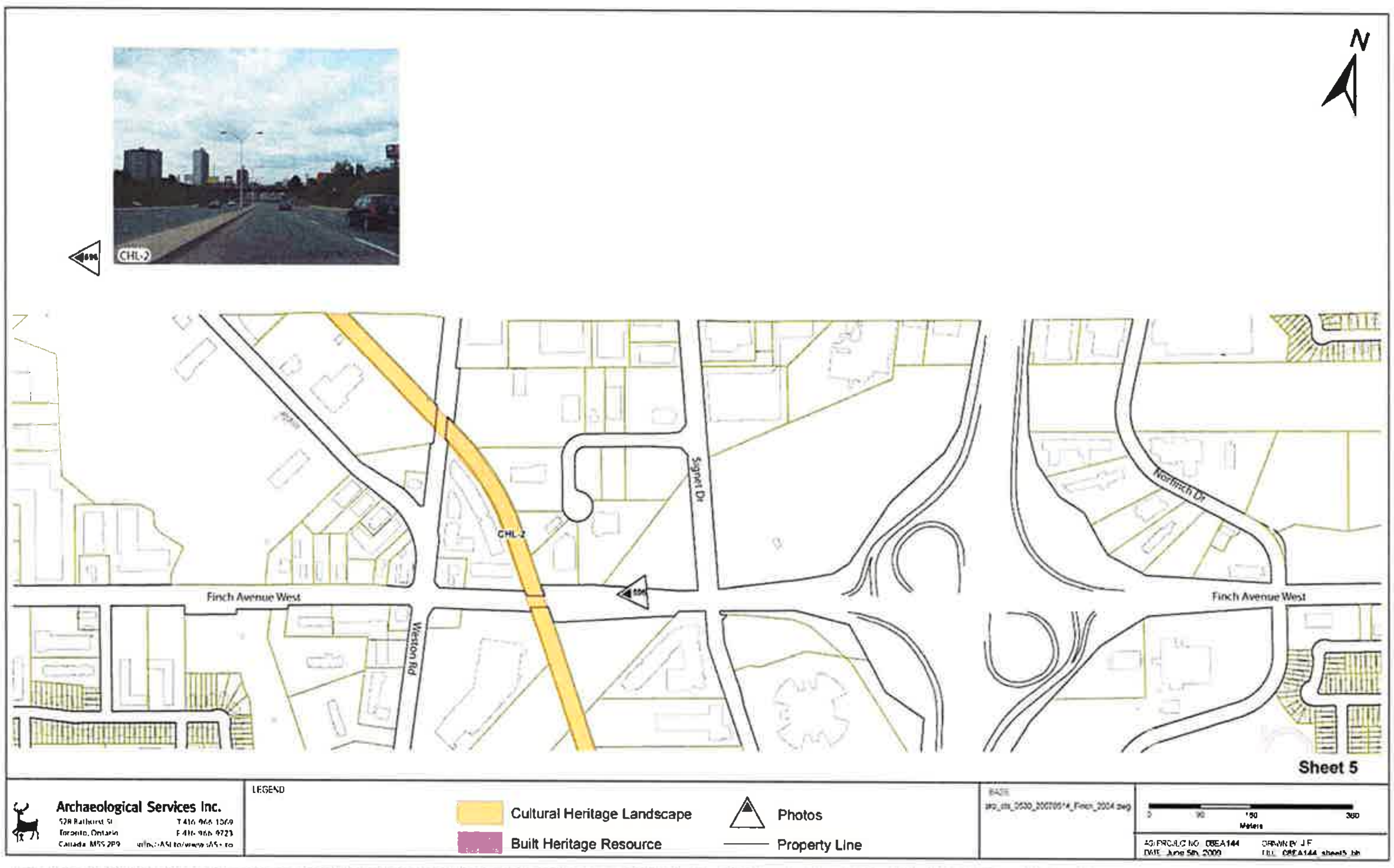
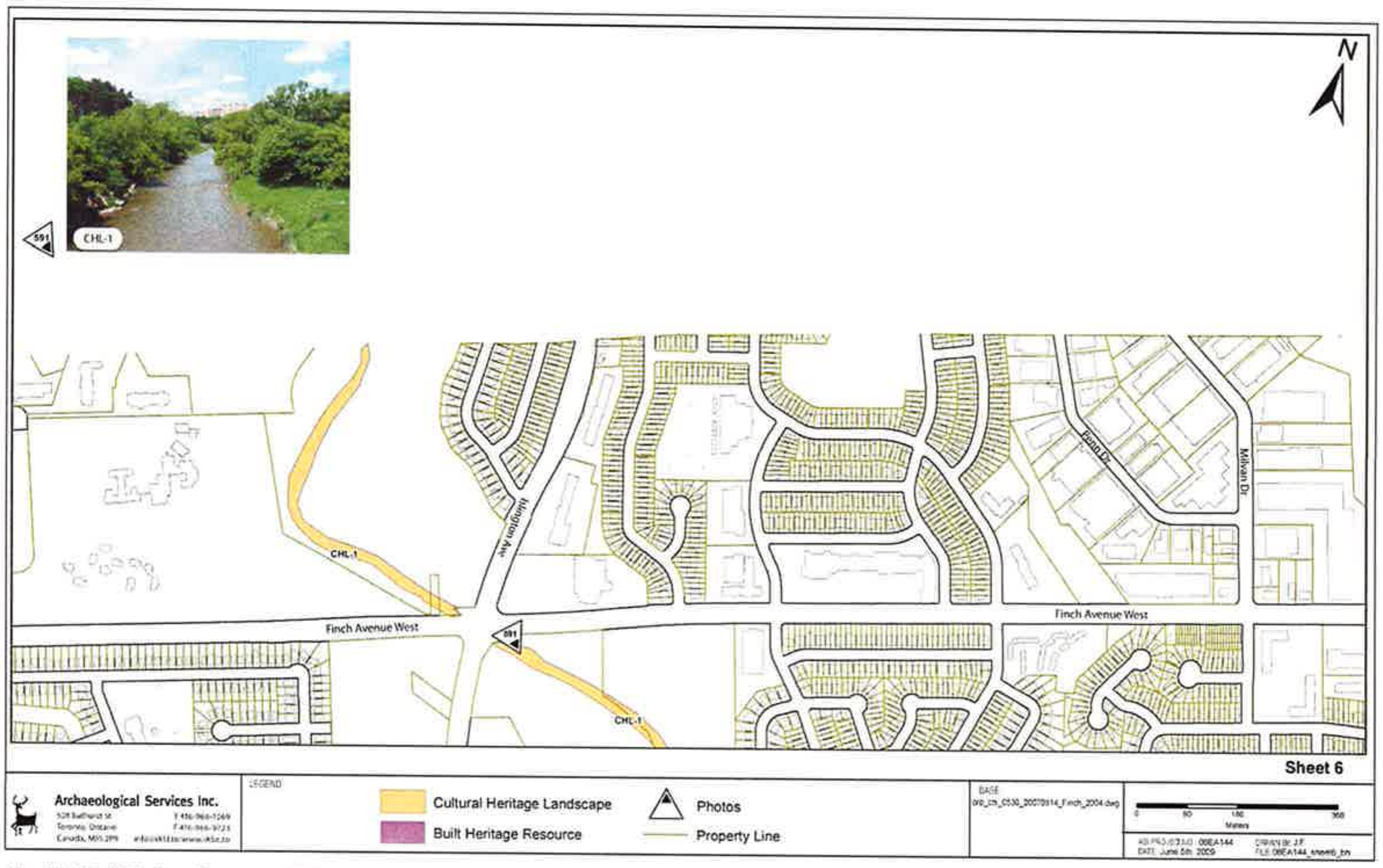


Identified Built Heritage Resources (BHR) and Cultural Heritage Landscapes (CHL) in the Etobicoke-Finch West Light Rail Transit Corridor



Identified Built Heritage Resources (BHR) and Cultural Heritage Landscapes (CHL) in the Etobicoke-Finch West Light Rail Transit Corridor

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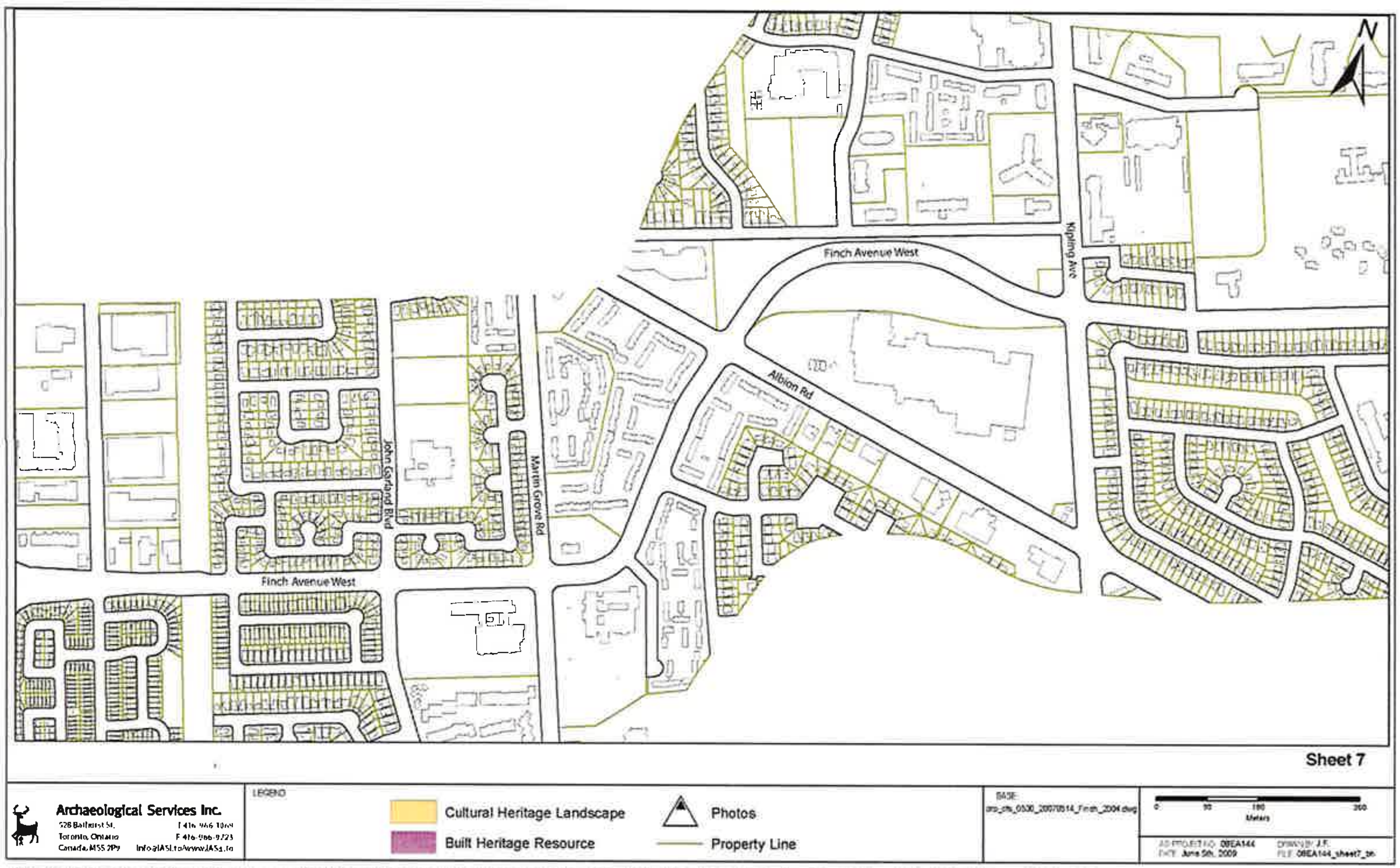
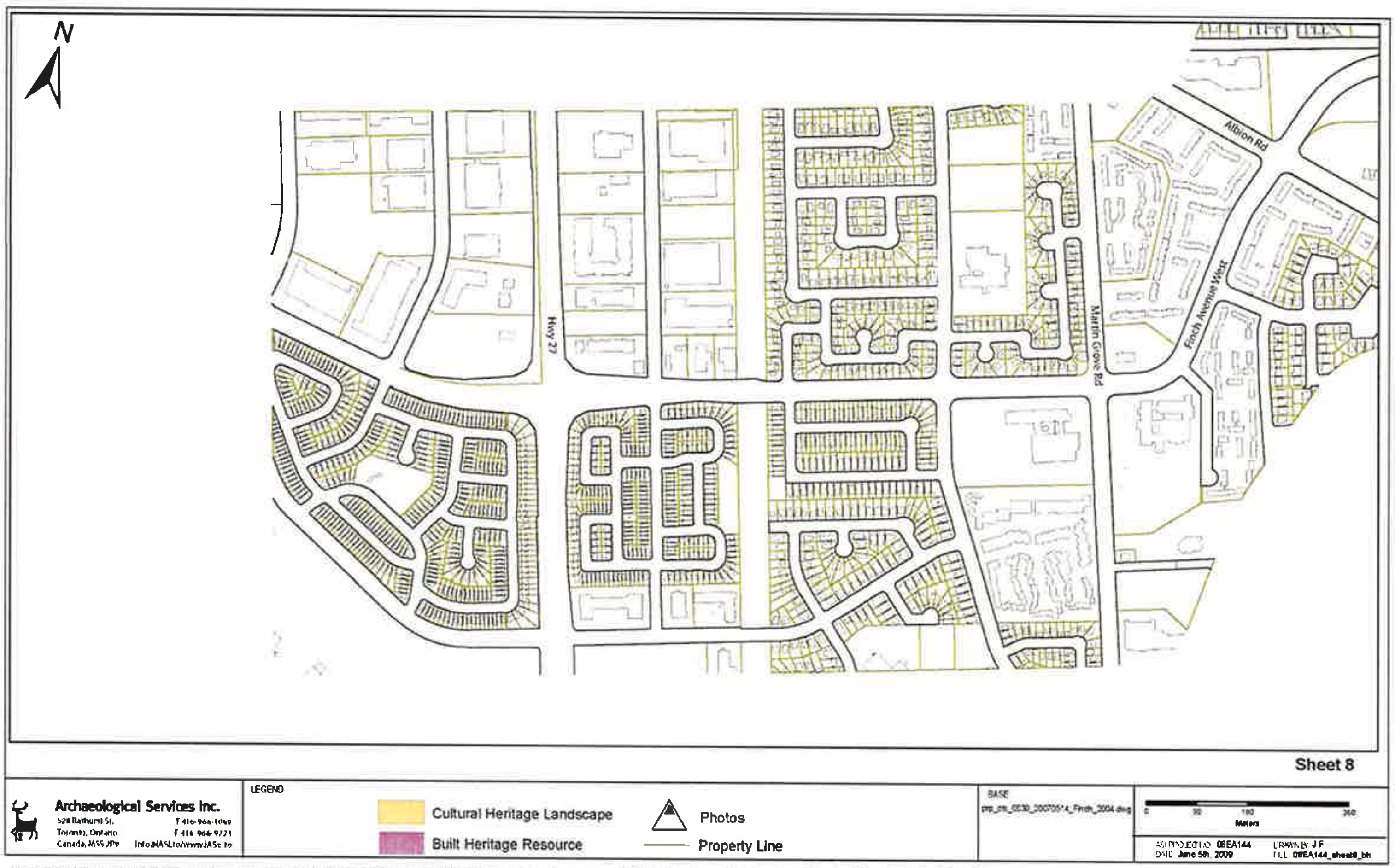


Identified Built Heritage Resources (BHR) and Cultural Heritage Landscapes (CHL) in the Etobicoke-Finch West Light Rail Transit Corridor



Identified Built Heritage Resources (BHR) and Cultural Heritage Landscapes (CHL) in the Etobicoke-Finch West Light Rail Transit Corridor

APPENDIX B:

Inventory of Identified Built Heritage Resources and Cultural Heritage Landscapes

Etobicoke-Finch West Light Rail Transit Corridor
Humber College (North Campus) to Finch Subway Station
Transit Project Assessment Study, City of Toronto, Ontario

Built Heritage Resource:	BHR 1
Address:	1130 Finch Avenue West
Feature Type:	Church and Cemetery
Construction Period:	1901
Description:	Resources found on this property are officially known as the Elia Episcopal Church and Cemetery, however the site has also been referred to as Gram's Appointment Church and Cemetery. The church structure features simple architectural detailing and is constructed with a combination of brick and stone materials. The structure maintains a high degree of integrity, with original pointed window openings, front elevation vestibule, datestone, and buttresses still extant. A sympathetic addition has been made on the northern elevation of the structure.
Other Comments:	This property is designated under the *Ontario Heritage Act*.

Built Heritage Resource: BHR 2

Address: 685 Finch Avenue West

Feature Type: Rectory and convent

Construction Period: 1928/1957

Description: This property consists of a rectory, three storey hospital complex, and stone gazebos. Records from the City of Toronto's Heritage Inventory confirm that the rectory building was constructed in 1928 and was previously known as 'Shadowbrook.' Purportedly, these grounds were developed by the Sisters of St. Joseph and named to commemorate Sister Mar y Bernard, one of the first Sisters of St. Joseph to arrive in Toronto. In 1954, the Missionary Sisters of the Precious Blood were provided access to the grounds by the Sisters of St. Joseph to establish St. Bernard's Convalescent Hospital (Missionary Sisters of the Precious Blood 2009). In 1957, the currently extant brick building was constructed to accommodate provision of additional hospital beds. This property is surrounded by a tranquil setting, with its eastern elevation fronting on to the Don River. Several stone gazebos are extant on the eastern elevation of the property.

Other Comments: This property is listed on the City of Toronto's Heritage Inventory.

Built Heritage Resource: BHR 3

Address: 172 Finch Avenue West

Feature Type: Residence

Construction Period: 1920s

Description: This 1 ½ storey structure retains a medium-pitched, side facing gabled roof, extending eaves, central dormer, front veranda, pressed concrete foundations, and original window trim. It dates to the 1920s and was constructed by Arthur Edward Waine, an English immigrant who acquired the property in the 1920s. Purportedly, this structure is the oldest surviving residence on Finch Avenue West (City of Toronto 2007).

Other Comments: This property is currently recommended for designation under Part IV of the *Ontario Heritage Act.*

Built Heritage Resource:	BHR 4
Address:	1125 Finch Avenue West
Feature Type:	Industrial/Commercial
Construction Period:	Late 1960s
Description:	This one storey structure features a brick exterior with wooden siding featured on its northern elevation. It is currently operated as the Open Window Bakery, a commercial operation that was established in the City of Toronto in 1957.
Other Comments:	Identified during the field review.

Built Heritage Resource:	BHR 5
Address:	5600 Finch Avenue East
Feature Type:	Commercial
Construction Period:	Circa 1920s-1930s
Description:	This 2 storey structure features a flat roof line, brick exterior, concrete window moulding, and sizeable, single pane windows on the northern and eastern elevation. Based on the structure's massing, location, and architectural detailing it was likely built to serve a commercial function, likely related to banking or utility provision.
Other Comments:	Identified during the field review.

Cultural Heritage Landscape: CHL 1

Address: Islington Avenue and Finch Avenue

Feature Type: Waterscape

Description: The Humber River served an integral role in early nineteenth century settlement activities and mill-based industries.

Other Comments: Identified through historic mapping.

Cultural Heritage Landscape: CHL 2

Address: Between Highway 400 and Weston Road

Feature Type: Railscape

Description: This railway was constructed in 1853 by Northern Railway to connect Toronto with Collingwood. It is currently operated by Canadian National.

Other Comments: Identified through historic mapping.

Cultural Heritage Landscape:	CHL 3
Address:	Finch Avenue, east of Jane Street
Feature Type:	Waterscape
Description:	This tributary of the Humber River served an important role in early settlement activities.
Other Comments:	Identified through historic mapping.

Cultural Heritage Landscape:	CHL 4
Address:	Finch Avenue West, between Keele Street and Dufferin Street
Feature Type:	Railscape
Description:	This railway was originally constructed in 1871 by the Toronto, Grey, and Bruce Company. It is currently operated by Canadian Pacific.
Other Comments:	Identified through historic mapping

Cultural Heritage Landscape:	CHL 5
Address:	Finch Avenue, Dufferin Creek
Feature Type:	Waterscape
Description:	The Dufferin Creek waterscape is a tributary of the West Don River and is associated with early settlement activities and mill-based industries during the early to mid nineteenth century.
Other Comments:	Identified through historic mapping.

Cultural Heritage Landscape:	CHL 6
Address:	Finch Avenue, East of Dufferin Street
Feature Type:	Waterscape
Description:	The west branch of the Don River has played an important role in the City of Toronto's pre-contact history and later, nineteenth century European settlement activities.
Other Comments:	Identified during the field review.

Cultural Heritage Landscape:	CHL 7
Address:	North and south side of Finch Avenue, between Endell Street and Edithvale Drive
Feature Type:	Circa 1950s streetscape
Construction Period:	Post-war
Description:	This streetscape consists of circa 1950s, post-war residential resources. Structures generally consist of 1 ½ storey massing, gabled roofs, central hall floor plans, concrete foundations, and brick exteriors. The streetscape has experienced minimal, incompatible infill development and circa 1950s structures are generally unaltered. This streetscape is associated with post-war residential development in the City of Toronto and North York specifically.
Other Comments:	Identified during the field review.

Appendix G

Traffic

G1. Existing Conditions Traffic Data

G2. Impact Assessment (Future) Traffic Data

G1. Existing Conditions Traffic Data

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis
www.accu-traffic.ca
Tel: 1-416-910-0171
Fax: 1-888-711-3125

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period
From: 5:00:00
To: 9:00:00

One Hour Peak
From: 7:15:00
To: 8:15:00

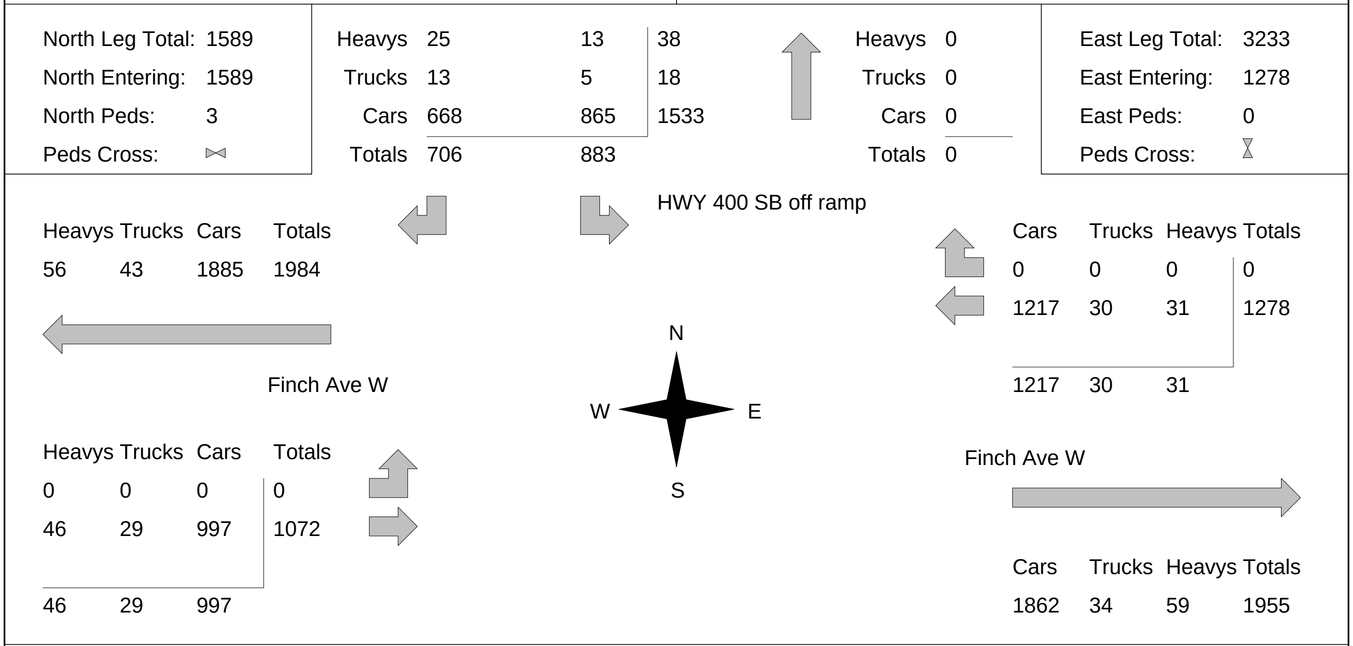
Municipality: Toronto
Site #: 1406100001
Intersection: Finch Ave W & HWY 400 SB off ran
TFR File #: 1
Count date: 13-May-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Finch Ave W runs W/E



North Leg Total: 1589
North Entering: 1589
North Peds: 3
Peds Cross: ⋈

Heavys	25	13	38
Trucks	13	5	18
Cars	668	865	1533
Totals	706	883	

Heavys	0
Trucks	0
Cars	0
Totals	0

East Leg Total: 3233
East Entering: 1278
East Peds: 0
Peds Cross: ⧖

Heavys	Trucks	Cars	Totals
56	43	1885	1984

Cars	Trucks	Heavys	Totals
0	0	0	0
1217	30	31	1278
1217	30	31	

Heavys	Trucks	Cars	Totals
0	0	0	0
46	29	997	1072
46	29	997	

Cars	Trucks	Heavys	Totals
1862	34	59	1955

Peds Cross: ⧖
West Peds: 0
West Entering: 1072
West Leg Total: 3056

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis
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Tel: 1-416-910-0171
Fax: 1-888-711-3125

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:30:00

One Hour Peak
From: 16:30:00
To: 17:30:00

Municipality: Toronto
Site #: 1406100001
Intersection: Finch Ave W & HWY 400 SB off ran
TFR File #: 1
Count date: 13-May-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Finch Ave W runs W/E

North Leg Total:	1102
North Entering:	1102
North Peds:	8
Peds Cross:	⋈

Heavys	37	14	51	↑	Heavys	0
Trucks	13	9	22		Trucks	0
Cars	506	523	1029		Cars	0
Totals	556	546			Totals	0

East Leg Total:	3536
East Entering:	1376
East Peds:	0
Peds Cross:	⧗

HWY 400 SB off ramp

Heavys	Trucks	Cars	Totals
87	58	1787	1932

Finch Ave W

Heavys	Trucks	Cars	Totals
0	0	0	0
25	29	1560	1614
25	29	1560	

N

W E

S

Cars	Trucks	Heavys	Totals
0	0	0	0
1281	45	50	1376
1281	45	50	

Finch Ave W

Cars	Trucks	Heavys	Totals
2083	38	39	2160

Peds Cross:	⧗
West Peds:	0
West Entering:	1614
West Leg Total:	3546

Comments

Accu-Traffic Inc.

Total Count Diagram

Municipality: Toronto
Site #: 1406100001
Intersection: Finch Ave W & HWY 400 SB off ran
TFR File #: 1
Count date: 13-May-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Finch Ave W runs W/E

North Leg Total: 7039
North Entering: 7039
North Peds: 34
Peds Cross: ⋈

Heavys	177	86	263
Trucks	64	31	95
Cars	3191	3490	6681
Totals	3432	3607	

Heavys	0
Trucks	0
Cars	0
Totals	0

East Leg Total: 18358
East Entering: 7624
East Peds: 0
Peds Cross: ⧗

HWY 400 SB off ramp

Heavys	Trucks	Cars	Totals
424	230	10402	11056

Finch Ave W

Cars	Trucks	Heavys	Totals
0	0	0	0
7211	166	247	7624
7211	166	247	

N

W E

S

Heavys	Trucks	Cars	Totals
0	0	0	0
212	153	6762	7127
212	153	6762	

Finch Ave W

Cars	Trucks	Heavys	Totals
10252	184	298	10734

Peds Cross: ⧗
West Peds: 0
West Entering: 7127
West Leg Total: 18183

Comments

Accu-Traffic Inc.
Traffic Count Summary

Intersection	Finch Ave W & HWY 400 SB off ra	Count Date	13-May-14	Municipality	Toronto

North Approach Totals							South Approach Totals					
	Includes Cars, Trucks, & Heavys					North/South Total Approaches		Includes Cars, Trucks, & Heavys				
Hour Ending	Left	Thru	Right	Grand Total	Total Peds		Hour Ending	Left	Thru	Right	Grand Total	Total Peds
5:00:00	0	0	0	0	0	0	5:00:00	0	0	0	0	0
6:00:00	159	0	256	415	5	415	6:00:00	0	0	0	0	0
7:00:00	511	0	559	1070	8	1070	7:00:00	0	0	0	0	0
8:00:00	823	0	672	1495	5	1495	8:00:00	0	0	0	0	0
9:00:00	762	0	731	1493	0	1493	9:00:00	0	0	0	0	0
16:00:00	14	0	5	19	0	19	16:00:00	0	0	0	0	0
17:00:00	515	0	471	986	7	986	17:00:00	0	0	0	0	0
18:00:00	574	0	521	1095	5	1095	18:00:00	0	0	0	0	0
Totals:	3358	0	3215	6573	30	6573		0	0	0	0	0

East Approach Totals							West Approach Totals					
	Includes Cars, Trucks, & Heavys					East/West Total Approaches		Includes Cars, Trucks, & Heavys				
Hour Ending	Left	Thru	Right	Grand Total	Total Peds		Hour Ending	Left	Thru	Right	Grand Total	Total Peds
5:00:00	0	0	0	0	0	0	5:00:00	0	0	0	0	0
6:00:00	0	510	0	510	0	818	6:00:00	0	308	0	308	0
7:00:00	0	1352	0	1352	0	2200	7:00:00	0	848	0	848	0
8:00:00	0	1287	0	1287	0	2368	8:00:00	0	1081	0	1081	0
9:00:00	0	1242	0	1242	0	2308	9:00:00	0	1066	0	1066	0
16:00:00	0	0	0	0	0	4	16:00:00	0	4	0	4	0
17:00:00	0	1262	0	1262	0	2833	17:00:00	0	1571	0	1571	0
18:00:00	0	1419	0	1419	0	2946	18:00:00	0	1527	0	1527	0
Totals:	0	7072	0	7072	0	13477		0	6405	0	6405	0

Calculated Values for Traffic Crossing Major Street

Hours Ending:	5:00	6:00	7:00	8:00	9:00	16:00	17:00	18:00
Crossing Values:	0	159	511	823	762	14	515	574

Accu-Traffic Inc.

Count Date: 13-May-14 Site #: 1406100001

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	11	11	0	0	19	19	0	0	0	0	1	1	3	3	0	0	3	3	2	2
5:30:00	45	34	0	0	60	41	0	0	0	0	1	0	5	2	0	0	8	5	3	1
5:45:00	81	36	0	0	127	67	0	0	0	0	1	0	8	3	0	0	8	0	4	1
6:00:00	148	67	0	0	246	119	1	1	0	0	1	0	10	2	0	0	9	1	5	1
6:15:00	226	78	0	0	349	103	1	0	0	0	2	1	17	7	0	0	11	2	5	0
6:30:00	327	101	0	0	457	108	1	0	0	0	2	0	19	2	0	0	17	6	9	4
6:45:00	468	141	0	0	591	134	1	0	0	0	2	0	20	1	0	0	24	7	12	3
7:00:00	646	178	0	0	781	190	1	0	0	0	2	0	23	3	0	0	32	8	13	1
7:15:00	803	157	0	0	928	147	3	2	0	0	4	2	27	4	0	0	37	5	15	2
7:30:00	1023	220	0	0	1065	137	5	2	0	0	6	2	34	7	0	0	44	7	15	0
7:45:00	1228	205	0	0	1226	161	6	1	0	0	8	2	36	2	0	0	54	10	15	0
8:00:00	1448	220	0	0	1417	191	7	1	0	0	11	3	38	2	0	0	59	5	18	3
8:15:00	1668	220	0	0	1596	179	8	1	0	0	17	6	40	2	0	0	62	3	18	0
8:30:00	1823	155	0	0	1763	167	11	3	0	0	19	2	45	5	0	0	71	9	18	0
8:45:00	2013	190	0	0	1934	171	12	1	0	0	31	12	50	5	0	0	83	12	18	0
9:00:00	2189	176	0	0	2080	146	14	2	0	0	35	4	52	2	0	0	103	20	18	0
9:15:00	2202	13	0	0	2085	5	14	0	0	0	35	0	53	1	0	0	103	0	18	0
16:00:00	2202	0	0	0	2085	0	14	0	0	0	35	0	53	0	0	0	103	0	18	0
16:15:00	2301	99	0	0	2175	90	14	0	0	0	38	3	57	4	0	0	105	2	18	0
16:30:00	2449	148	0	0	2272	97	15	1	0	0	40	2	64	7	0	0	111	6	19	1
16:45:00	2564	115	0	0	2386	114	19	4	0	0	41	1	69	5	0	0	119	8	19	0
17:00:00	2694	130	0	0	2515	129	21	2	0	0	44	3	69	0	0	0	135	16	25	6
17:15:00	2824	130	0	0	2644	129	22	1	0	0	48	4	72	3	0	0	140	5	26	1
17:30:00	2972	148	0	0	2778	134	24	2	0	0	53	5	78	6	0	0	148	8	27	1
17:45:00	3119	147	0	0	2890	112	25	1	0	0	56	3	83	5	0	0	153	5	29	2
18:00:00	3248	129	0	0	2995	105	27	2	0	0	59	3	83	0	0	0	161	8	30	1
18:15:00	3374	126	0	0	3093	98	28	1	0	0	60	1	86	3	0	0	171	10	33	3
18:30:00	3490	116	0	0	3191	98	31	3	0	0	64	4	86	0	0	0	177	6	34	1
18:45:00	3490	0	0	0	3191	0	31	0	0	0	64	0	86	0	0	0	177	0	34	0
18:45:15	3490	0	0	0	3191	0	31	0	0	0	64	0	86	0	0	0	177	0	34	0

Accu-Traffic Inc.

Count Date: 13-May-14 Site #: 1406100001

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	0	0	54	54	0	0	0	0	1	1	0	0	0	0	4	4	0	0	0	0
5:30:00	0	0	140	86	0	0	0	0	2	1	0	0	0	0	10	6	0	0	0	0
5:45:00	0	0	259	119	0	0	0	0	3	1	0	0	0	0	12	2	0	0	0	0
6:00:00	0	0	483	224	0	0	0	0	4	1	0	0	0	0	23	11	0	0	0	0
6:15:00	0	0	704	221	0	0	0	0	8	4	0	0	0	0	30	7	0	0	0	0
6:30:00	0	0	1042	338	0	0	0	0	13	5	0	0	0	0	41	11	0	0	0	0
6:45:00	0	0	1383	341	0	0	0	0	16	3	0	0	0	0	50	9	0	0	0	0
7:00:00	0	0	1786	403	0	0	0	0	20	4	0	0	0	0	56	6	0	0	0	0
7:15:00	0	0	2079	293	0	0	0	0	28	8	0	0	0	0	73	17	0	0	0	0
7:30:00	0	0	2383	304	0	0	0	0	34	6	0	0	0	0	82	9	0	0	0	0
7:45:00	0	0	2661	278	0	0	0	0	42	8	0	0	0	0	89	7	0	0	0	0
8:00:00	0	0	3002	341	0	0	0	0	50	8	0	0	0	0	97	8	0	0	0	0
8:15:00	0	0	3296	294	0	0	0	0	58	8	0	0	0	0	104	7	0	0	0	0
8:30:00	0	0	3590	294	0	0	0	0	65	7	0	0	0	0	116	12	0	0	0	0
8:45:00	0	0	3868	278	0	0	0	0	72	7	0	0	0	0	123	7	0	0	0	0
9:00:00	0	0	4175	307	0	0	0	0	83	11	0	0	0	0	133	10	0	0	0	0
9:15:00	0	0	4175	0	0	0	0	0	83	0	0	0	0	0	133	0	0	0	0	0
16:00:00	0	0	4175	0	0	0	0	0	83	0	0	0	0	0	133	0	0	0	0	0
16:15:00	0	0	4438	263	0	0	0	0	89	6	0	0	0	0	146	13	0	0	0	0
16:30:00	0	0	4734	296	0	0	0	0	101	12	0	0	0	0	161	15	0	0	0	0
16:45:00	0	0	5036	302	0	0	0	0	110	9	0	0	0	0	178	17	0	0	0	0
17:00:00	0	0	5339	303	0	0	0	0	121	11	0	0	0	0	193	15	0	0	0	0
17:15:00	0	0	5671	332	0	0	0	0	136	15	0	0	0	0	205	12	0	0	0	0
17:30:00	0	0	6015	344	0	0	0	0	146	10	0	0	0	0	211	6	0	0	0	0
17:45:00	0	0	6346	331	0	0	0	0	151	5	0	0	0	0	226	15	0	0	0	0
18:00:00	0	0	6680	334	0	0	0	0	158	7	0	0	0	0	234	8	0	0	0	0
18:15:00	0	0	6973	293	0	0	0	0	163	5	0	0	0	0	242	8	0	0	0	0
18:30:00	0	0	7211	238	0	0	0	0	166	3	0	0	0	0	247	5	0	0	0	0
18:45:00	0	0	7211	0	0	0	0	0	166	0	0	0	0	0	247	0	0	0	0	0
18:45:15	0	0	7211	0	0	0	0	0	166	0	0	0	0	0	247	0	0	0	0	0

Accu-Traffic Inc.

Count Date: 13-May-14 Site #: 1406100001

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:45:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Accu-Traffic Inc.

Count Date: 13-May-14 Site #: 1406100001

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	0	0	47	47	0	0	0	0	0	0	0	0	0	0	5	5	0	0	0	0
5:30:00	0	0	98	51	0	0	0	0	0	0	0	0	0	0	10	5	0	0	0	0
5:45:00	0	0	194	96	0	0	0	0	1	1	0	0	0	0	14	4	0	0	0	0
6:00:00	0	0	289	95	0	0	0	0	4	3	0	0	0	0	15	1	0	0	0	0
6:15:00	0	0	407	118	0	0	0	0	6	2	0	0	0	0	19	4	0	0	0	0
6:30:00	0	0	598	191	0	0	0	0	10	4	0	0	0	0	28	9	0	0	0	0
6:45:00	0	0	834	236	0	0	0	0	19	9	0	0	0	0	40	12	0	0	0	0
7:00:00	0	0	1084	250	0	0	0	0	24	5	0	0	0	0	48	8	0	0	0	0
7:15:00	0	0	1311	227	0	0	0	0	29	5	0	0	0	0	70	22	0	0	0	0
7:30:00	0	0	1581	270	0	0	0	0	34	5	0	0	0	0	84	14	0	0	0	0
7:45:00	0	0	1850	269	0	0	0	0	44	10	0	0	0	0	93	9	0	0	0	0
8:00:00	0	0	2083	233	0	0	0	0	50	6	0	0	0	0	104	11	0	0	0	0
8:15:00	0	0	2308	225	0	0	0	0	58	8	0	0	0	0	116	12	0	0	0	0
8:30:00	0	0	2580	272	0	0	0	0	69	11	0	0	0	0	128	12	0	0	0	0
8:45:00	0	0	2827	247	0	0	0	0	75	6	0	0	0	0	142	14	0	0	0	0
9:00:00	0	0	3058	231	0	0	0	0	87	12	0	0	0	0	158	16	0	0	0	0
9:15:00	0	0	3062	4	0	0	0	0	87	0	0	0	0	0	158	0	0	0	0	0
16:00:00	0	0	3062	0	0	0	0	0	87	0	0	0	0	0	158	0	0	0	0	0
16:15:00	0	0	3431	369	0	0	0	0	94	7	0	0	0	0	163	5	0	0	0	0
16:30:00	0	0	3778	347	0	0	0	0	105	11	0	0	0	0	172	9	0	0	0	0
16:45:00	0	0	4193	415	0	0	0	0	114	9	0	0	0	0	179	7	0	0	0	0
17:00:00	0	0	4570	377	0	0	0	0	121	7	0	0	0	0	187	8	0	0	0	0
17:15:00	0	0	4955	385	0	0	0	0	127	6	0	0	0	0	190	3	0	0	0	0
17:30:00	0	0	5338	383	0	0	0	0	134	7	0	0	0	0	197	7	0	0	0	0
17:45:00	0	0	5691	353	0	0	0	0	139	5	0	0	0	0	199	2	0	0	0	0
18:00:00	0	0	6059	368	0	0	0	0	142	3	0	0	0	0	204	5	0	0	0	0
18:15:00	0	0	6407	348	0	0	0	0	148	6	0	0	0	0	208	4	0	0	0	0
18:30:00	0	0	6762	355	0	0	0	0	153	5	0	0	0	0	212	4	0	0	0	0
18:45:00	0	0	6762	0	0	0	0	0	153	0	0	0	0	0	212	0	0	0	0	0
18:45:15	0	0	6762	0	0	0	0	0	153	0	0	0	0	0	212	0	0	0	0	0

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period
From: 5:00:00
To: 9:00:00

One Hour Peak
From: 7:15:00
To: 8:15:00

Municipality: Toronto
Site #: 1406100002
Intersection: Finch Ave W & HWY 400 NB off ran
TFR File #: 1
Count date: 13-May-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Finch Ave W runs W/E

East Leg Total: 2942
East Entering: 934
East Peds: 0
Peds Cross: ⧗

Heavys	Trucks	Cars	Totals
50	35	1545	1630

Finch Ave W

Cars	Trucks	Heavys	Totals
883	22	29	934
0	0	0	0
883	22	29	

N
W E
S

Heavys	Trucks	Cars	Totals
39	21	1491	1551
0	0	0	0
39	21	1491	

Finch Ave W

Cars	Trucks	Heavys	Totals
1930	29	49	2008

HWY 400 NB off ramp

Peds Cross: ⧗
West Peds: 0
West Entering: 1551
West Leg Total: 3181

Cars	0
Trucks	0
Heavys	0
Totals	0

Cars	662	439	1101
Trucks	13	8	21
Heavys	21	10	31
Totals	696	457	

Peds Cross: ⋈
South Peds: 6
South Entering: 1153
South Leg Total: 1153

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis
www.accu-traffic.ca
Tel: 1-416-910-0171
Fax: 1-888-711-3125

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:30:00

One Hour Peak
From: 17:00:00
To: 18:00:00

Municipality: Toronto
Site #: 1406100002
Intersection: Finch Ave W & HWY 400 NB off ran
TFR File #: 1
Count date: 13-May-14

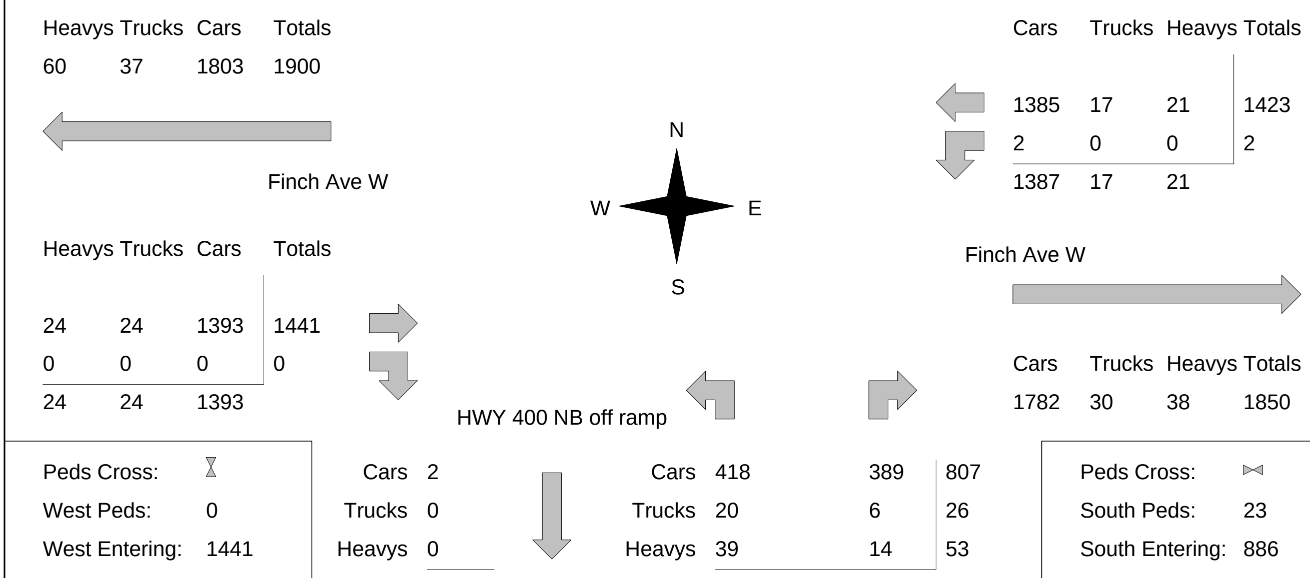
Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Finch Ave W runs W/E

East Leg Total: 3275
East Entering: 1425
East Peds: 0
Peds Cross: ⧗



Heavys	Trucks	Cars	Totals
60	37	1803	1900

Cars	Trucks	Heavys	Totals
1385	17	21	1423
2	0	0	2
1387	17	21	

Heavys	Trucks	Cars	Totals
24	24	1393	1441
0	0	0	0
24	24	1393	

Cars	Trucks	Heavys	Totals
1782	30	38	1850

Peds Cross: ⧗
West Peds: 0
West Entering: 1441
West Leg Total: 3341

Cars	2
Trucks	0
Heavys	0
Totals	2

Cars	418	389	807
Trucks	20	6	26
Heavys	39	14	53
Totals	477	409	

Peds Cross: ⋈
South Peds: 23
South Entering: 886
South Leg Total: 888

Comments

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Accu-Traffic Inc.

Total Count Diagram

Municipality: Toronto
Site #: 1406100002
Intersection: Finch Ave W & HWY 400 NB off ran
TFR File #: 1
Count date: 13-May-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

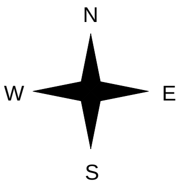
Major Road: Finch Ave W runs W/E

East Leg Total: 16596
East Entering: 6543
East Peds: 0
Peds Cross: ⧗

Heavys	Trucks	Cars	Totals
346	195	9604	10145

Finch Ave W

Cars	Trucks	Heavys	Totals
6286	117	138	6541
2	0	0	2
6288	117	138	



Heavys	Trucks	Cars	Totals
183	127	7367	7677
0	0	0	0
183	127	7367	

Finch Ave W

Cars	Trucks	Heavys	Totals
9627	170	256	10053

HWY 400 NB off ramp

Peds Cross: ⧗
West Peds: 0
West Entering: 7677
West Leg Total: 17822

Cars	2
Trucks	0
Heavys	0
Totals	2

Cars	3318	2260	5578
Trucks	78	43	121
Heavys	208	73	281
Totals	3604	2376	

Peds Cross: ⋈
South Peds: 89
South Entering: 5980
South Leg Total: 5982

Comments

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Tel: 1-416-910-0171
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Accu-Traffic Inc.
Traffic Count Summary

Intersection Finch Ave W & HWY 400 NB off ra | **Count Date** 13-May-14 | **Municipality** Toronto

North Approach Totals							South Approach Totals					
	Includes Cars, Trucks, & Heavys							Includes Cars, Trucks, & Heavys				
Hour Ending	Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches	Hour Ending	Left	Thru	Right	Grand Total	Total Peds
5:00:00	0	0	0	0	0	0	5:00:00	0	0	0	0	0
6:00:00	0	0	0	0	0	476	6:00:00	318	0	158	476	9
7:00:00	0	0	0	0	0	1166	7:00:00	851	0	315	1166	8
8:00:00	0	0	0	0	0	1103	8:00:00	663	0	440	1103	7
9:00:00	0	0	0	0	0	1156	9:00:00	692	0	464	1156	13
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	0	0	0	0	0	795	17:00:00	434	0	361	795	23
18:00:00	0	0	0	0	0	886	18:00:00	477	0	409	886	23
Totals:	0	0	0	0	0	5582		3435	0	2147	5582	83

East Approach Totals							West Approach Totals					
	Includes Cars, Trucks, & Heavys							Includes Cars, Trucks, & Heavys				
Hour Ending	Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches	Hour Ending	Left	Thru	Right	Grand Total	Total Peds
5:00:00	0	0	0	0	0	0	5:00:00	0	0	0	0	0
6:00:00	0	357	0	357	0	673	6:00:00	0	316	0	316	0
7:00:00	0	850	0	850	0	1793	7:00:00	0	943	0	943	0
8:00:00	0	991	0	991	0	2442	8:00:00	0	1451	0	1451	0
9:00:00	0	909	0	909	0	2363	9:00:00	0	1454	0	1454	0
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	0	1373	0	1373	0	2719	17:00:00	0	1346	0	1346	0
18:00:00	2	1423	0	1425	0	2866	18:00:00	0	1441	0	1441	0
Totals:	2	5903	0	5905	0	12856		0	6951	0	6951	0

Calculated Values for Traffic Crossing Major Street

Hours Ending:	5:00	6:00	7:00	8:00	9:00	16:00	17:00	18:00
Crossing Values:	0	318	851	663	692	0	434	477

Accu-Traffic Inc.

Count Date: 13-May-14 Site #: 1406100002

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:45:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Accu-Traffic Inc.

Count Date: 13-May-14 Site #: 1406100002

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	0	0	50	50	0	0	0	0	1	1	0	0	0	0	3	3	0	0	0	0
5:30:00	0	0	116	66	0	0	0	0	3	2	0	0	0	0	6	3	0	0	0	0
5:45:00	0	0	214	98	0	0	0	0	5	2	0	0	0	0	7	1	0	0	0	0
6:00:00	0	0	337	123	0	0	0	0	8	3	0	0	0	0	12	5	0	0	0	0
6:15:00	0	0	491	154	0	0	0	0	14	6	0	0	0	0	14	2	0	0	0	0
6:30:00	0	0	703	212	0	0	0	0	18	4	0	0	0	0	21	7	0	0	0	0
6:45:00	0	0	916	213	0	0	0	0	21	3	0	0	0	0	27	6	0	0	0	0
7:00:00	0	0	1150	234	0	0	0	0	25	4	0	0	0	0	32	5	0	0	0	0
7:15:00	0	0	1380	230	0	0	0	0	31	6	0	0	0	0	36	4	0	0	0	0
7:30:00	0	0	1604	224	0	0	0	0	37	6	0	0	0	0	42	6	0	0	0	0
7:45:00	0	0	1856	252	0	0	0	0	41	4	0	0	0	0	51	9	0	0	0	0
8:00:00	0	0	2090	234	0	0	0	0	50	9	0	0	0	0	58	7	0	0	0	0
8:15:00	0	0	2263	173	0	0	0	0	53	3	0	0	0	0	65	7	0	0	0	0
8:30:00	0	0	2506	243	0	0	0	0	61	8	0	0	0	0	74	9	0	0	0	0
8:45:00	0	0	2720	214	0	0	0	0	64	3	0	0	0	0	81	7	0	0	0	0
9:00:00	0	0	2950	230	0	0	0	0	70	6	0	0	0	0	87	6	0	0	0	0
9:15:00	0	0	2950	0	0	0	0	0	70	0	0	0	0	0	87	0	0	0	0	0
16:00:00	0	0	2950	0	0	0	0	0	70	0	0	0	0	0	87	0	0	0	0	0
16:15:00	0	0	3268	318	0	0	0	0	74	4	0	0	0	0	91	4	0	0	0	0
16:30:00	0	0	3582	314	0	0	0	0	80	6	0	0	0	0	97	6	0	0	0	0
16:45:00	0	0	3947	365	0	0	0	0	84	4	0	0	0	0	105	8	0	0	0	0
17:00:00	0	0	4281	334	0	0	0	0	90	6	0	0	0	0	109	4	0	0	0	0
17:15:00	0	0	4652	371	0	0	0	0	94	4	0	0	0	0	114	5	0	0	0	0
17:30:00	2	2	5018	366	0	0	0	0	102	8	0	0	0	0	118	4	0	0	0	0
17:45:00	2	0	5354	336	0	0	0	0	105	3	0	0	0	0	126	8	0	0	0	0
18:00:00	2	0	5666	312	0	0	0	0	107	2	0	0	0	0	130	4	0	0	0	0
18:15:00	2	0	6005	339	0	0	0	0	110	3	0	0	0	0	134	4	0	0	0	0
18:30:00	2	0	6286	281	0	0	0	0	117	7	0	0	0	0	138	4	0	0	0	0
18:45:00	2	0	6286	0	0	0	0	0	117	0	0	0	0	0	138	0	0	0	0	0
18:45:15	2	0	6286	0	0	0	0	0	117	0	0	0	0	0	138	0	0	0	0	0

Accu-Traffic Inc.

Count Date: 13-May-14 Site #: 1406100002

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	25	25	0	0	22	22	0	0	0	0	0	0	3	3	0	0	3	3	1	1
5:30:00	80	55	0	0	48	26	0	0	0	0	0	0	7	4	0	0	6	3	1	0
5:45:00	157	77	0	0	89	41	1	1	0	0	0	0	9	2	0	0	10	4	7	6
6:00:00	297	140	0	0	140	51	2	1	0	0	4	4	19	10	0	0	14	4	9	2
6:15:00	446	149	0	0	203	63	3	1	0	0	7	3	26	7	0	0	15	1	11	2
6:30:00	654	208	0	0	288	85	7	4	0	0	8	1	35	9	0	0	17	2	13	2
6:45:00	865	211	0	0	368	80	8	1	0	0	8	0	44	9	0	0	21	4	13	0
7:00:00	1111	246	0	0	439	71	9	1	0	0	11	3	49	5	0	0	23	2	17	4
7:15:00	1248	137	0	0	537	98	13	4	0	0	16	5	65	16	0	0	27	4	20	3
7:30:00	1408	160	0	0	645	108	14	1	0	0	18	2	71	6	0	0	30	3	23	3
7:45:00	1552	144	0	0	749	104	19	5	0	0	20	2	75	4	0	0	33	3	23	0
8:00:00	1730	178	0	0	857	108	23	4	0	0	21	1	79	4	0	0	35	2	24	1
8:15:00	1910	180	0	0	976	119	26	3	0	0	24	3	86	7	0	0	37	2	26	2
8:30:00	2048	138	0	0	1074	98	28	2	0	0	27	3	95	9	0	0	42	5	29	3
8:45:00	2204	156	0	0	1180	106	30	2	0	0	29	2	98	3	0	0	43	1	36	7
9:00:00	2383	179	0	0	1300	120	35	5	0	0	31	2	106	8	0	0	46	3	37	1
9:15:00	2383	0	0	0	1300	0	35	0	0	0	31	0	106	0	0	0	46	0	37	0
16:00:00	2383	0	0	0	1300	0	35	0	0	0	31	0	106	0	0	0	46	0	37	0
16:15:00	2468	85	0	0	1378	78	39	4	0	0	31	0	115	9	0	0	46	0	45	8
16:30:00	2562	94	0	0	1475	97	44	5	0	0	32	1	131	16	0	0	49	3	51	6
16:45:00	2652	90	0	0	1545	70	48	4	0	0	33	1	143	12	0	0	52	3	56	5
17:00:00	2745	93	0	0	1648	103	55	7	0	0	36	3	158	15	0	0	54	2	60	4
17:15:00	2835	90	0	0	1731	83	64	9	0	0	38	2	169	11	0	0	58	4	64	4
17:30:00	2935	100	0	0	1827	96	69	5	0	0	38	0	176	7	0	0	62	4	70	6
17:45:00	3044	109	0	0	1922	95	74	5	0	0	40	2	187	11	0	0	65	3	80	10
18:00:00	3163	119	0	0	2037	115	75	1	0	0	42	2	197	10	0	0	68	3	83	3
18:15:00	3251	88	0	0	2152	115	78	3	0	0	43	1	204	7	0	0	72	4	87	4
18:30:00	3318	67	0	0	2260	108	78	0	0	0	43	0	208	4	0	0	73	1	89	2
18:45:00	3318	0	0	0	2260	0	78	0	0	0	43	0	208	0	0	0	73	0	89	0
18:45:15	3318	0	0	0	2260	0	78	0	0	0	43	0	208	0	0	0	73	0	89	0

Accu-Traffic Inc.

Count Date: 13-May-14 Site #: 1406100002

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	0	0	43	43	0	0	0	0	0	0	0	0	0	0	4	4	0	0	0	0
5:30:00	0	0	99	56	0	0	0	0	0	0	0	0	0	0	8	4	0	0	0	0
5:45:00	0	0	188	89	0	0	0	0	1	1	0	0	0	0	13	5	0	0	0	0
6:00:00	0	0	297	109	0	0	0	0	2	1	0	0	0	0	17	4	0	0	0	0
6:15:00	0	0	432	135	0	0	0	0	3	1	0	0	0	0	26	9	0	0	0	0
6:30:00	0	0	623	191	0	0	0	0	5	2	0	0	0	0	28	2	0	0	0	0
6:45:00	0	0	883	260	0	0	0	0	8	3	0	0	0	0	36	8	0	0	0	0
7:00:00	0	0	1205	322	0	0	0	0	10	2	0	0	0	0	44	8	0	0	0	0
7:15:00	0	0	1479	274	0	0	0	0	13	3	0	0	0	0	59	15	0	0	0	0
7:30:00	0	0	1859	380	0	0	0	0	16	3	0	0	0	0	76	17	0	0	0	0
7:45:00	0	0	2235	376	0	0	0	0	22	6	0	0	0	0	85	9	0	0	0	0
8:00:00	0	0	2590	355	0	0	0	0	28	6	0	0	0	0	92	7	0	0	0	0
8:15:00	0	0	2970	380	0	0	0	0	34	6	0	0	0	0	98	6	0	0	0	0
8:30:00	0	0	3322	352	0	0	0	0	45	11	0	0	0	0	106	8	0	0	0	0
8:45:00	0	0	3662	340	0	0	0	0	51	6	0	0	0	0	112	6	0	0	0	0
9:00:00	0	0	3985	323	0	0	0	0	60	9	0	0	0	0	119	7	0	0	0	0
9:15:00	0	0	3985	0	0	0	0	0	60	0	0	0	0	0	119	0	0	0	0	0
16:00:00	0	0	3985	0	0	0	0	0	60	0	0	0	0	0	119	0	0	0	0	0
16:15:00	0	0	4268	283	0	0	0	0	67	7	0	0	0	0	126	7	0	0	0	0
16:30:00	0	0	4621	353	0	0	0	0	77	10	0	0	0	0	135	9	0	0	0	0
16:45:00	0	0	4953	332	0	0	0	0	81	4	0	0	0	0	146	11	0	0	0	0
17:00:00	0	0	5271	318	0	0	0	0	88	7	0	0	0	0	151	5	0	0	0	0
17:15:00	0	0	5633	362	0	0	0	0	94	6	0	0	0	0	156	5	0	0	0	0
17:30:00	0	0	5984	351	0	0	0	0	101	7	0	0	0	0	165	9	0	0	0	0
17:45:00	0	0	6312	328	0	0	0	0	107	6	0	0	0	0	173	8	0	0	0	0
18:00:00	0	0	6664	352	0	0	0	0	112	5	0	0	0	0	175	2	0	0	0	0
18:15:00	0	0	7025	361	0	0	0	0	119	7	0	0	0	0	180	5	0	0	0	0
18:30:00	0	0	7367	342	0	0	0	0	127	8	0	0	0	0	183	3	0	0	0	0
18:45:00	0	0	7367	0	0	0	0	0	127	0	0	0	0	0	183	0	0	0	0	0
18:45:15	0	0	7367	0	0	0	0	0	127	0	0	0	0	0	183	0	0	0	0	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis
www.accu-traffic.ca
Tel: 1-416-910-0171
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Accu-Traffic Inc.

Morning Peak Diagram

Specified Period		**One Hour Peak**	
From:	5:00:00	**From:**	8:00:00
To:	9:00:00	**To:**	9:00:00

Municipality: Toronto
Site #: 1406100003
Intersection: Finch Ave W & Oakdale Rd / Norfin
TFR File #: 1
Count date: 13-May-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Finch Ave W runs W/E

North Leg Total: 688
North Entering: 369
North Peds: 14
Peds Cross: ⋈

Heavys	5	3	1	9
Trucks	7	6	4	17
Cars	102	139	102	343
Totals	114	148	107	

Heavys	4
Trucks	9
Cars	306
Totals	319

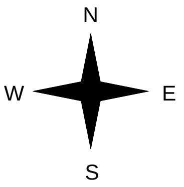
East Leg Total: 2958
East Entering: 1280
East Peds: 97
Peds Cross: ⧗

Norfinch Dr

Heavys	Trucks	Cars	Totals
41	35	1268	1344

Cars	Trucks	Heavys	Totals
74	2	3	79
970	18	31	1019
181	1	0	182
1225	21	34	

Finch Ave W



Heavys	Trucks	Cars	Totals
0	1	161	162
32	23	1390	1445
3	13	284	300
35	37	1835	

Finch Ave W

Cars	Trucks	Heavys	Totals
1614	31	33	1678

Oakdale Rd

Peds Cross: ⧗
West Peds: 60
West Entering: 1907
West Leg Total: 3251

Cars	604
Trucks	20
Heavys	6
Totals	630

Cars	196	71	122	389
Trucks	10	6	4	20
Heavys	5	1	0	6
Totals	211	78	126	

Peds Cross: ⋈
South Peds: 57
South Entering: 415
South Leg Total: 1045

Comments

Accu-Traffic Inc.
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Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period		**One Hour Peak**	
From:	16:00:00	**From:**	16:45:00
To:	18:30:00	**To:**	17:45:00

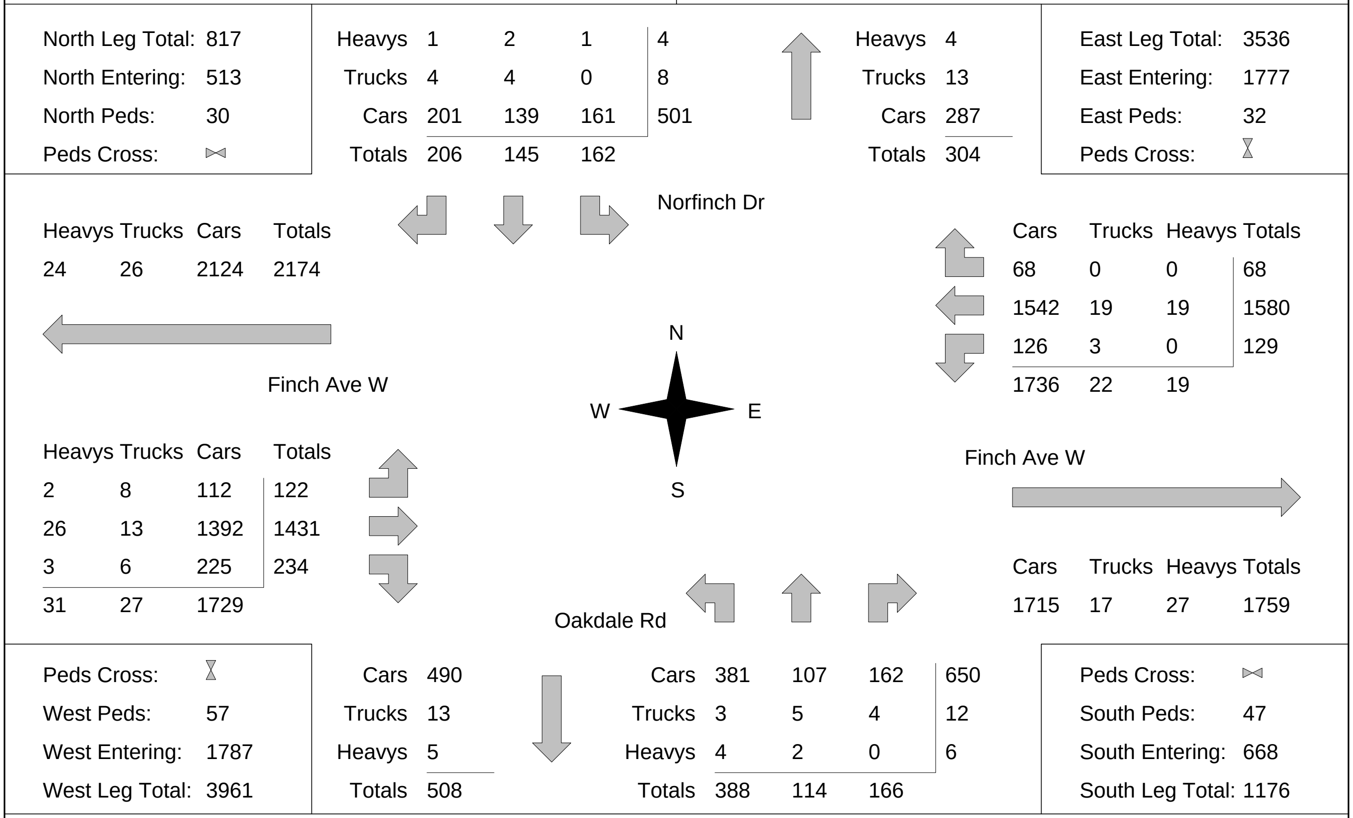
Municipality: Toronto
Site #: 1406100003
Intersection: Finch Ave W & Oakdale Rd / Norfin
TFR File #: 1
Count date: 13-May-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Finch Ave W runs W/E



North Leg Total: 817
North Entering: 513
North Peds: 30
Peds Cross: ⋈

Heavys	1	2	1	4
Trucks	4	4	0	8
Cars	201	139	161	501
Totals	206	145	162	

Heavys	4
Trucks	13
Cars	287
Totals	304

East Leg Total: 3536
East Entering: 1777
East Peds: 32
Peds Cross: ⧗

Norfinch Dr

Heavys	Trucks	Cars	Totals
24	26	2124	2174

Finch Ave W

Cars	Trucks	Heavys	Totals
68	0	0	68
1542	19	19	1580
126	3	0	129
1736	22	19	

Heavys	Trucks	Cars	Totals
2	8	112	122
26	13	1392	1431
3	6	225	234
31	27	1729	

Finch Ave W

Cars	Trucks	Heavys	Totals
1715	17	27	1759

Oakdale Rd

Peds Cross: ⧗
West Peds: 57
West Entering: 1787
West Leg Total: 3961

Cars	490
Trucks	13
Heavys	5
Totals	508

Cars	381	107	162	650
Trucks	3	5	4	12
Heavys	4	2	0	6
Totals	388	114	166	

Peds Cross: ⋈
South Peds: 47
South Entering: 668
South Leg Total: 1176

Comments

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Accu-Traffic Inc.

Total Count Diagram

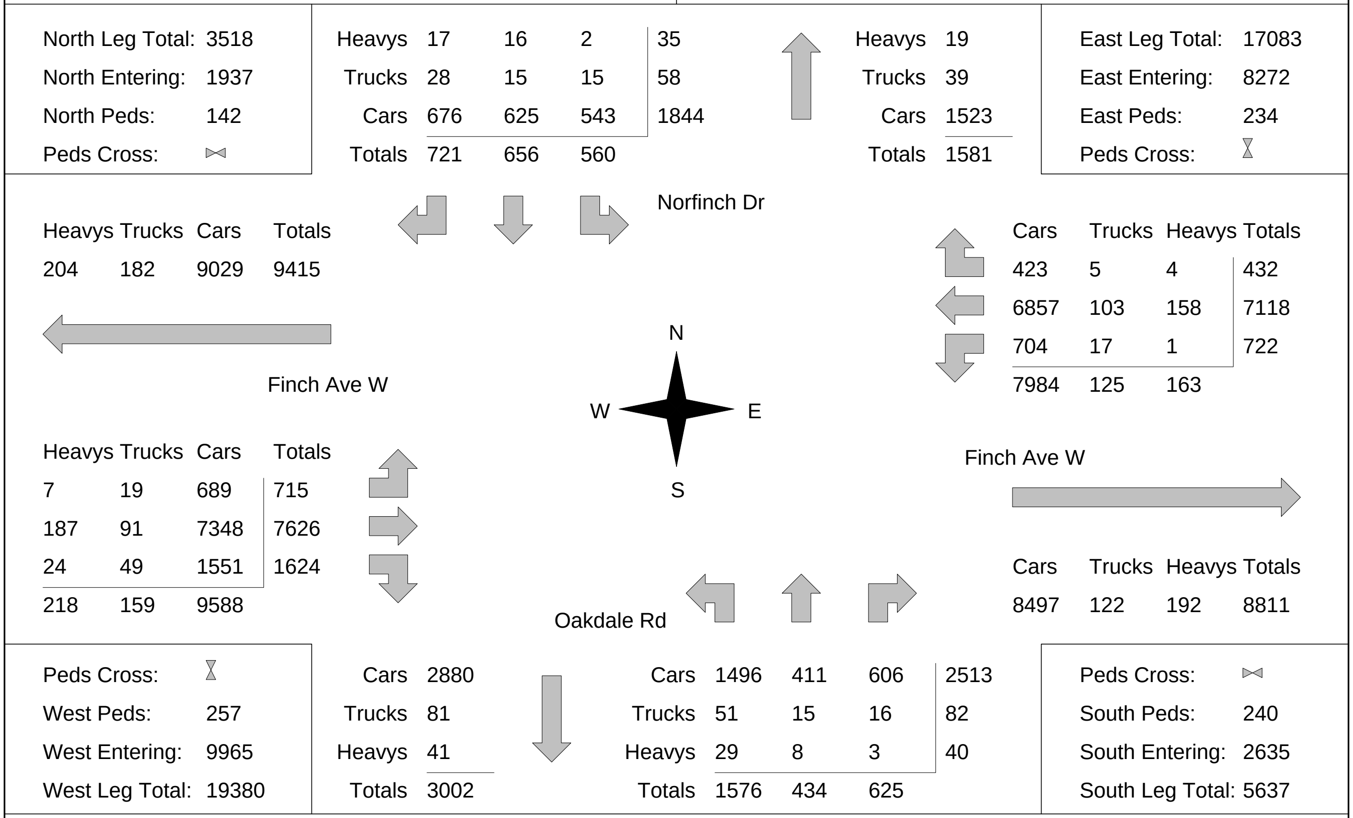
Municipality: Toronto
Site #: 1406100003
Intersection: Finch Ave W & Oakdale Rd / Norfin
TFR File #: 1
Count date: 13-May-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Finch Ave W runs W/E



North Leg Total: 3518
North Entering: 1937
North Peds: 142
Peds Cross: ⋈

Heavys	17	16	2	35
Trucks	28	15	15	58
Cars	676	625	543	1844
Totals	721	656	560	

Heavys	19
Trucks	39
Cars	1523
Totals	1581

East Leg Total: 17083
East Entering: 8272
East Peds: 234
Peds Cross: ⧗

Norfinch Dr

Heavys	Trucks	Cars	Totals
204	182	9029	9415

Cars	Trucks	Heavys	Totals
423	5	4	432
6857	103	158	7118
704	17	1	722
7984	125	163	

Finch Ave W

N
W E
S

Heavys	Trucks	Cars	Totals
7	19	689	715
187	91	7348	7626
24	49	1551	1624
218	159	9588	

Finch Ave W

Cars	Trucks	Heavys	Totals
8497	122	192	8811

Oakdale Rd

Peds Cross: ⧗
West Peds: 257
West Entering: 9965
West Leg Total: 19380

Cars	2880
Trucks	81
Heavys	41
Totals	3002

Cars	1496	411	606	2513
Trucks	51	15	16	82
Heavys	29	8	3	40
Totals	1576	434	625	

Peds Cross: ⋈
South Peds: 240
South Entering: 2635
South Leg Total: 5637

Comments

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis
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Tel: 1-416-910-0171
Fax: 1-888-711-3125

Accu-Traffic Inc.
Traffic Count Summary

Intersection Finch Ave W & Oakdale Rd / Norfir **Count Date** 13-May-14 **Municipality** Toronto

North Approach Totals							South Approach Totals					
	Includes Cars, Trucks, & Heavys					North/South Total Approaches		Includes Cars, Trucks, & Heavys				
Hour Ending	Left	Thru	Right	Grand Total	Total Peds		Hour Ending	Left	Thru	Right	Grand Total	Total Peds
5:00:00	0	0	0	0	0	0	5:00:00	0	0	0	0	0
6:00:00	9	10	15	34	8	104	6:00:00	55	9	6	70	1
7:00:00	26	56	64	146	18	373	7:00:00	149	40	38	227	22
8:00:00	56	116	92	264	24	622	8:00:00	223	73	62	358	36
9:00:00	107	148	114	369	14	784	9:00:00	211	78	126	415	57
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	154	136	170	460	31	1129	17:00:00	403	104	162	669	62
18:00:00	148	141	194	483	29	1100	18:00:00	368	93	156	617	39
Totals:	500	607	649	1756	124	4112		1409	397	550	2356	217

East Approach Totals							West Approach Totals					
	Includes Cars, Trucks, & Heavys					East/West Total Approaches		Includes Cars, Trucks, & Heavys				
Hour Ending	Left	Thru	Right	Grand Total	Total Peds		Hour Ending	Left	Thru	Right	Grand Total	Total Peds
5:00:00	0	0	0	0	0	0	5:00:00	0	0	0	0	0
6:00:00	18	357	27	402	2	876	6:00:00	40	359	75	474	5
7:00:00	91	863	93	1047	16	2294	7:00:00	132	863	252	1247	13
8:00:00	123	1006	90	1219	28	3090	8:00:00	110	1356	405	1871	44
9:00:00	182	1019	79	1280	97	3187	9:00:00	162	1445	300	1907	60
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	135	1604	63	1802	41	3487	17:00:00	110	1358	217	1685	60
18:00:00	120	1575	63	1758	34	3593	18:00:00	126	1459	250	1835	50
Totals:	669	6424	415	7508	218	16527		680	6840	1499	9019	232

Calculated Values for Traffic Crossing Major Street

Hours Ending:	5:00	6:00	7:00	8:00	9:00	16:00	17:00	18:00
Crossing Values:	0	81	260	467	623	0	794	741

Accu-Traffic Inc.

Count Date: 13-May-14 **Site #: 1406100003**

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	1	1	1	1
5:30:00	2	2	3	3	7	2	0	0	0	0	0	0	0	0	1	1	1	0	1	0
5:45:00	4	2	6	3	11	4	0	0	0	0	0	0	0	0	1	0	1	0	2	1
6:00:00	9	5	9	3	13	2	0	0	0	0	1	1	0	0	1	0	1	0	8	6
6:15:00	12	3	20	11	25	12	0	0	0	0	4	3	0	0	1	0	1	0	12	4
6:30:00	17	5	30	10	37	12	0	0	1	1	7	3	0	0	1	0	2	1	16	4
6:45:00	22	5	45	15	46	9	3	3	1	0	9	2	0	0	3	2	4	2	25	9
7:00:00	32	10	61	16	62	16	3	0	1	0	12	3	0	0	4	1	5	1	26	1
7:15:00	35	3	74	13	86	24	5	2	1	0	13	1	0	0	4	0	5	0	31	5
7:30:00	45	10	100	26	106	20	6	1	1	0	15	2	0	0	7	3	7	2	33	2
7:45:00	62	17	134	34	117	11	7	1	1	0	15	0	0	0	8	1	7	0	42	9
8:00:00	83	21	171	37	145	28	8	1	3	2	16	1	0	0	8	0	10	3	50	8
8:15:00	111	28	217	46	170	25	8	0	6	3	18	2	1	1	9	1	12	2	52	2
8:30:00	124	13	250	33	204	34	9	1	6	0	21	3	1	0	10	1	13	1	62	10
8:45:00	161	37	277	27	223	19	11	2	6	0	23	2	1	0	11	1	14	1	63	1
9:00:00	185	24	310	33	247	24	12	1	9	3	23	0	1	0	11	0	15	1	64	1
9:00:15	185	0	310	0	247	0	12	0	9	0	23	0	1	0	11	0	15	0	64	0
16:00:00	185	0	310	0	247	0	12	0	9	0	23	0	1	0	11	0	15	0	64	0
16:15:00	217	32	365	55	299	52	14	2	9	0	23	0	1	0	12	1	15	0	74	10
16:30:00	256	39	392	27	330	31	14	0	9	0	23	0	1	0	12	0	16	1	86	12
16:45:00	295	39	417	25	375	45	15	1	10	1	23	0	1	0	13	1	16	0	90	4
17:00:00	335	40	443	26	415	40	15	0	10	0	24	1	2	1	13	0	16	0	95	5
17:15:00	379	44	481	38	482	67	15	0	12	2	26	2	2	0	13	0	17	1	104	9
17:30:00	420	41	519	38	538	56	15	0	12	0	27	1	2	0	14	1	17	0	112	8
17:45:00	456	36	556	37	576	38	15	0	14	2	27	0	2	0	15	1	17	0	120	8
18:00:00	483	27	578	22	605	29	15	0	14	0	27	0	2	0	15	0	17	0	124	4
18:15:00	514	31	604	26	654	49	15	0	15	1	28	1	2	0	16	1	17	0	130	6
18:30:00	543	29	625	21	676	22	15	0	15	0	28	0	2	0	16	0	17	0	142	12
18:45:00	543	0	625	0	676	0	15	0	15	0	28	0	2	0	16	0	17	0	142	0
18:45:15	543	0	625	0	676	0	15	0	15	0	28	0	2	0	16	0	17	0	142	0

Accu-Traffic Inc.

Count Date: 13-May-14 Site #: 1406100003

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	3	3	45	45	7	7	0	0	1	1	0	0	0	0	3	3	0	0	0	0
5:30:00	8	5	107	62	13	6	0	0	3	2	0	0	0	0	6	3	0	0	0	0
5:45:00	11	3	206	99	21	8	0	0	3	0	0	0	0	0	9	3	0	0	0	0
6:00:00	17	6	338	132	27	6	1	1	4	1	0	0	0	0	15	6	0	0	2	2
6:15:00	23	6	504	166	45	18	2	1	8	4	0	0	0	0	18	3	1	1	7	5
6:30:00	35	12	709	205	54	9	2	0	9	1	1	1	0	0	23	5	1	0	12	5
6:45:00	73	38	931	222	89	35	3	1	10	1	1	0	0	0	31	8	1	0	15	3
7:00:00	106	33	1169	238	118	29	3	0	15	5	1	0	0	0	36	5	1	0	18	3
7:15:00	136	30	1402	233	149	31	4	1	17	2	1	0	0	0	44	8	1	0	21	3
7:30:00	164	28	1613	211	172	23	4	0	23	6	1	0	0	0	53	9	1	0	30	9
7:45:00	191	27	1864	251	193	21	4	0	28	5	2	1	0	0	62	9	1	0	43	13
8:00:00	227	36	2120	256	207	14	5	1	34	6	2	0	0	0	72	10	1	0	46	3
8:15:00	264	37	2313	193	232	25	5	0	39	5	3	1	0	0	79	7	2	1	55	9
8:30:00	291	27	2598	285	252	20	6	1	43	4	3	0	0	0	85	6	2	0	71	16
8:45:00	337	46	2837	239	261	9	6	0	46	3	3	0	0	0	93	8	4	2	90	19
9:00:00	408	71	3090	253	281	20	6	0	52	6	4	1	0	0	103	10	4	0	143	53
9:00:15	408	0	3090	0	281	0	6	0	52	0	4	0	0	0	103	0	4	0	143	0
16:00:00	408	0	3090	0	281	0	6	0	52	0	4	0	0	0	103	0	4	0	143	0
16:15:00	441	33	3481	391	291	10	8	2	57	5	5	1	0	0	109	6	4	0	150	7
16:30:00	465	24	3913	432	304	13	9	1	63	6	5	0	1	1	112	3	4	0	157	7
16:45:00	502	37	4289	376	325	21	9	0	69	6	5	0	1	0	120	8	4	0	175	18
17:00:00	538	36	4650	361	343	18	10	1	74	5	5	0	1	0	125	5	4	0	184	9
17:15:00	565	27	5024	374	372	29	11	1	77	3	5	0	1	0	128	3	4	0	192	8
17:30:00	595	30	5444	420	381	9	12	1	84	7	5	0	1	0	134	6	4	0	200	8
17:45:00	628	33	5831	387	393	12	12	0	88	4	5	0	1	0	139	5	4	0	207	7
18:00:00	654	26	6187	356	406	13	14	2	92	4	5	0	1	0	145	6	4	0	218	11
18:15:00	675	21	6539	352	412	6	14	0	94	2	5	0	1	0	150	5	4	0	229	11
18:30:00	704	29	6857	318	423	11	17	3	103	9	5	0	1	0	158	8	4	0	234	5
18:45:00	704	0	6857	0	423	0	17	0	103	0	5	0	1	0	158	0	4	0	234	0
18:45:15	704	0	6857	0	423	0	17	0	103	0	5	0	1	0	158	0	4	0	234	0

Accu-Traffic Inc.

Count Date: 13-May-14 Site #: 1406100003

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	8	8	1	1	2	2	0	0	0	0	0	0	1	1	0	0	0	0	0	0
5:30:00	18	10	3	2	5	3	1	1	0	0	0	0	1	0	0	0	0	0	0	0
5:45:00	32	14	5	2	5	0	5	4	0	0	0	0	1	0	0	0	0	0	1	1
6:00:00	47	15	9	4	6	1	7	2	0	0	0	0	1	0	0	0	0	0	1	0
6:15:00	67	20	13	4	13	7	10	3	0	0	0	0	1	0	0	0	0	0	7	6
6:30:00	88	21	25	12	22	9	14	4	0	0	0	0	5	4	0	0	0	0	13	6
6:45:00	129	41	38	13	33	11	15	1	0	0	0	0	7	2	0	0	0	0	16	3
7:00:00	178	49	49	11	43	10	16	1	0	0	0	0	10	3	0	0	1	1	23	7
7:15:00	222	44	67	18	45	2	19	3	0	0	0	0	11	1	0	0	2	1	29	6
7:30:00	268	46	81	14	57	12	26	7	0	0	1	1	12	1	0	0	2	0	40	11
7:45:00	323	55	96	15	81	24	27	1	0	0	3	2	13	1	0	0	2	0	50	10
8:00:00	382	59	122	26	99	18	29	2	0	0	5	2	16	3	0	0	2	0	59	9
8:15:00	436	54	134	12	120	21	32	3	0	0	7	2	18	2	0	0	2	0	66	7
8:30:00	477	41	143	9	136	16	36	4	3	3	8	1	20	2	0	0	2	0	78	12
8:45:00	521	44	175	32	167	31	38	2	5	2	9	1	21	1	1	1	2	0	97	19
9:00:00	578	57	193	18	221	54	39	1	6	1	9	0	21	0	1	0	2	0	116	19
9:00:15	578	0	193	0	221	0	39	0	6	0	9	0	21	0	1	0	2	0	116	0
16:00:00	578	0	193	0	221	0	39	0	6	0	9	0	21	0	1	0	2	0	116	0
16:15:00	684	106	221	28	256	35	41	2	6	0	9	0	21	0	2	1	2	0	126	10
16:30:00	776	92	243	22	289	33	43	2	7	1	11	2	24	3	3	1	3	1	141	15
16:45:00	870	94	261	18	331	42	44	1	7	0	11	0	25	1	5	2	3	0	157	16
17:00:00	970	100	291	30	378	47	45	1	8	1	13	2	26	1	5	0	3	0	178	21
17:15:00	1058	88	311	20	406	28	46	1	9	1	14	1	27	1	7	2	3	0	186	8
17:30:00	1168	110	341	30	453	47	47	1	11	2	15	1	29	2	7	0	3	0	191	5
17:45:00	1251	83	368	27	493	40	47	0	12	1	15	0	29	0	7	0	3	0	204	13
18:00:00	1333	82	377	9	532	39	47	0	13	1	15	0	29	0	7	0	3	0	217	13
18:15:00	1409	76	399	22	567	35	48	1	14	1	15	0	29	0	8	1	3	0	226	9
18:30:00	1496	87	411	12	606	39	51	3	15	1	16	1	29	0	8	0	3	0	240	14
18:45:00	1496	0	411	0	606	0	51	0	15	0	16	0	29	0	8	0	3	0	240	0
18:45:15	1496	0	411	0	606	0	51	0	15	0	16	0	29	0	8	0	3	0	240	0

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Accu-Traffic Inc.

Count Date: 13-May-14 Site #: 1406100003

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	4	4	56	56	5	5	0	0	0	0	0	0	0	0	6	6	0	0	0	0
5:30:00	16	12	112	56	19	14	0	0	1	1	0	0	0	0	13	7	0	0	1	1
5:45:00	28	12	204	92	45	26	0	0	3	2	1	1	0	0	20	7	0	0	1	0
6:00:00	39	11	327	123	71	26	1	1	5	2	3	2	0	0	27	7	1	1	5	4
6:15:00	61	22	464	137	109	38	1	0	6	1	6	3	0	0	35	8	3	2	6	1
6:30:00	90	29	666	202	153	44	1	0	7	1	8	2	0	0	41	6	3	0	9	3
6:45:00	116	26	908	242	224	71	2	1	9	2	8	0	1	1	49	8	3	0	15	6
7:00:00	167	51	1156	248	311	87	2	0	12	3	10	2	3	2	54	5	6	3	18	3
7:15:00	196	29	1420	264	389	78	3	1	17	5	11	1	3	0	70	16	6	0	33	15
7:30:00	218	22	1760	340	512	123	3	0	22	5	14	3	3	0	80	10	8	2	39	6
7:45:00	245	27	2104	344	621	109	4	1	27	5	16	2	3	0	89	9	9	1	52	13
8:00:00	274	29	2450	346	707	86	5	1	32	5	16	0	3	0	96	7	9	0	62	10
8:15:00	312	38	2837	387	782	75	6	1	37	5	18	2	3	0	103	7	10	1	71	9
8:30:00	343	31	3192	355	844	62	6	0	47	10	21	3	3	0	115	12	10	0	91	20
8:45:00	383	40	3506	314	934	90	6	0	49	2	26	5	3	0	121	6	11	1	101	10
9:00:00	435	52	3840	334	991	57	6	0	55	6	29	3	3	0	128	7	12	1	122	21
9:00:15	435	0	3840	0	991	0	6	0	55	0	29	0	3	0	128	0	12	0	122	0
16:00:00	435	0	3840	0	991	0	6	0	55	0	29	0	3	0	128	0	12	0	122	0
16:15:00	463	28	4131	291	1030	39	6	0	61	6	30	1	3	0	132	4	16	4	136	14
16:30:00	494	31	4490	359	1090	60	9	3	65	4	32	2	3	0	139	7	19	3	153	17
16:45:00	516	22	4810	320	1144	54	9	0	68	3	34	2	4	1	148	9	21	2	169	16
17:00:00	539	23	5155	345	1193	49	11	2	72	4	35	1	4	0	154	6	21	0	182	13
17:15:00	565	26	5521	366	1244	51	14	3	74	2	37	2	5	1	159	5	23	2	203	21
17:30:00	602	37	5870	349	1305	61	15	1	76	2	40	3	5	0	166	7	23	0	213	10
17:45:00	628	26	6202	332	1369	64	17	2	81	5	40	0	6	1	174	8	24	1	226	13
18:00:00	655	27	6579	377	1431	62	18	1	84	3	44	4	7	1	177	3	24	0	232	6
18:15:00	672	17	6974	395	1492	61	18	0	89	5	47	3	7	0	184	7	24	0	245	13
18:30:00	689	17	7348	374	1551	59	19	1	91	2	49	2	7	0	187	3	24	0	257	12
18:45:00	689	0	7348	0	1551	0	19	0	91	0	49	0	7	0	187	0	24	0	257	0
18:45:15	689	0	7348	0	1551	0	19	0	91	0	49	0	7	0	187	0	24	0	257	0

Accu-Traffic Inc.

Morning Peak Diagram

Specified Period
From: 5:00:00
To: 9:00:00

One Hour Peak
From: 8:00:00
To: 9:00:00

Municipality: Toronto
Site #: 1406100004
Intersection: Finch Ave W & Pelican Gate
TFR File #: 1
Count date: 13-May-14

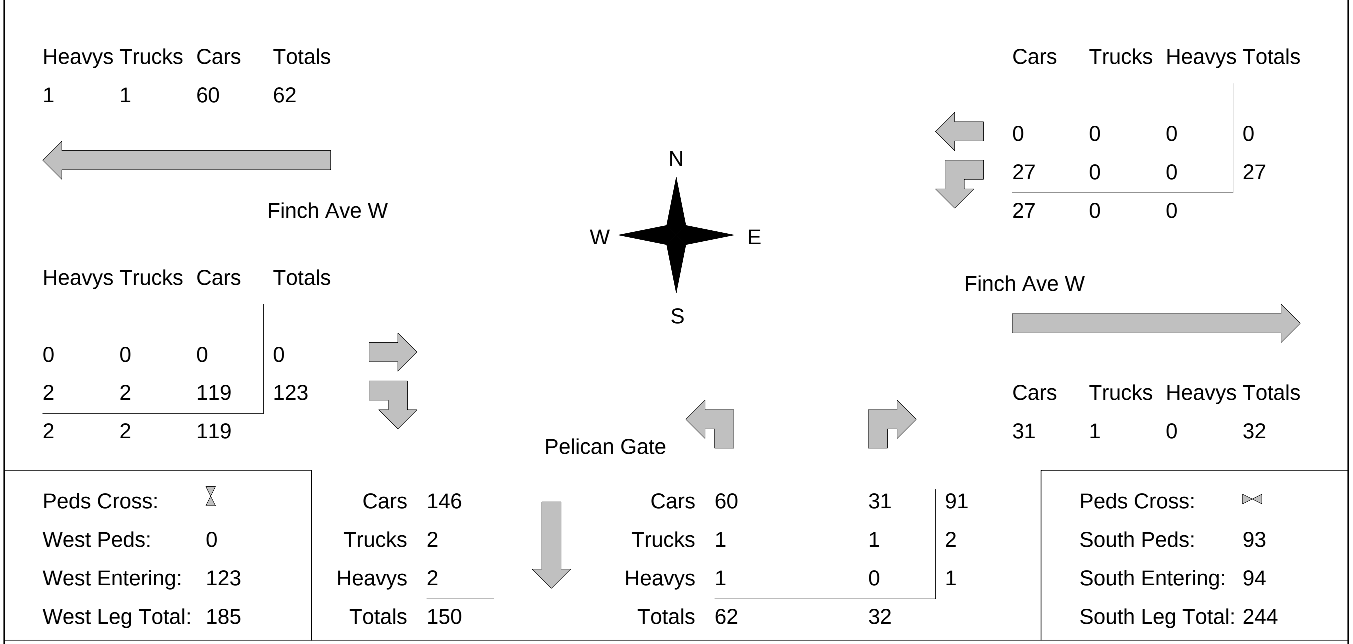
Weather conditions:

Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: Finch Ave W runs W/E

East Leg Total: 59
East Entering: 27
East Peds: 0
Peds Cross: ⧗



Heavys	Trucks	Cars	Totals
1	1	60	62

Cars	Trucks	Heavys	Totals
0	0	0	0
27	0	0	27
27	0	0	

Heavys	Trucks	Cars	Totals
0	0	0	0
2	2	119	123
2	2	119	

Cars	Trucks	Heavys	Totals
31	1	0	32

Peds Cross: ⧗
West Peds: 0
West Entering: 123
West Leg Total: 185

Cars	146
Trucks	2
Heavys	2
Totals	150

Cars	60	31	91
Trucks	1	1	2
Heavys	1	0	1
Totals	62	32	

Peds Cross: ⋈
South Peds: 93
South Entering: 94
South Leg Total: 244

Comments

Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period		One Hour Peak	
From:	16:00:00	**From:**	16:15:00
To:	18:30:00	**To:**	17:15:00

Municipality: Toronto
Site #: 1406100004
Intersection: Finch Ave W & Pelican Gate
TFR File #: 1
Count date: 13-May-14

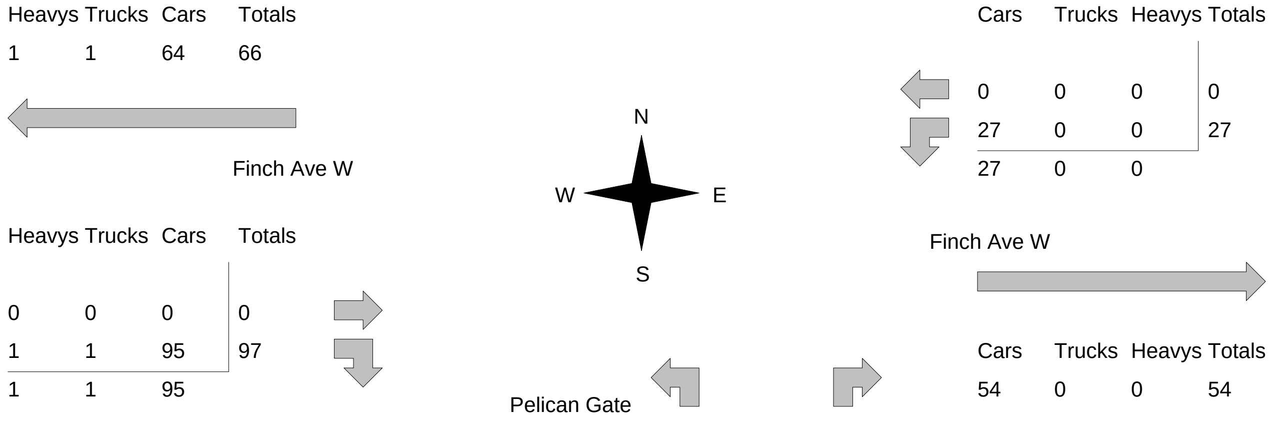
Weather conditions:

Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: Finch Ave W runs W/E

East Leg Total: 81
East Entering: 27
East Peds: 0
Peds Cross: ⧗



West leg, exiting:

Heavys	Trucks	Cars	Totals
1	1	64	66

West leg, entering:

Heavys	Trucks	Cars	Totals
0	0	0	0
1	1	95	97
1	1	95	

East leg, entering:

Cars	Trucks	Heavys	Totals
0	0	0	0
27	0	0	27
27	0	0	

East leg, exiting:

Cars	Trucks	Heavys	Totals
54	0	0	54

Peds Cross: ⧗
West Peds: 0
West Entering: 97
West Leg Total: 163

Cars	122
Trucks	1
Heavys	1
Totals	124

Cars	64	54	118
Trucks	1	0	1
Heavys	1	0	1
Totals	66	54	

Peds Cross: ⋈
South Peds: 79
South Entering: 120
South Leg Total: 244

Comments

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Accu-Traffic Inc.

Total Count Diagram

Municipality: Toronto
Site #: 1406100004
Intersection: Finch Ave W & Pelican Gate
TFR File #: 1
Count date: 13-May-14

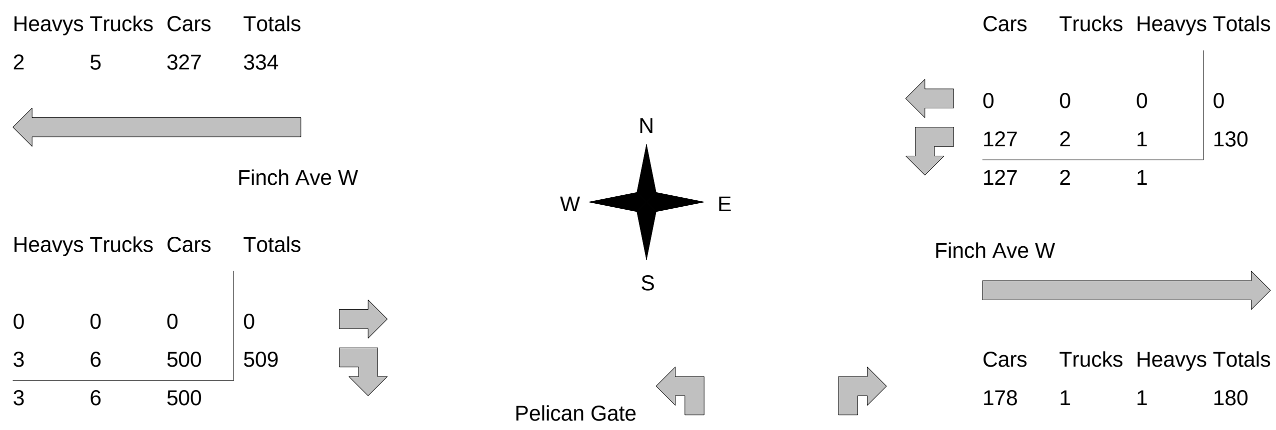
Weather conditions:

Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: Finch Ave W runs W/E

East Leg Total: 310
East Entering: 130
East Peds: 0
Peds Cross: ⧗



Heavys	Trucks	Cars	Totals
2	5	327	334

Cars	Trucks	Heavys	Totals
0	0	0	0
127	2	1	130
127	2	1	

Heavys	Trucks	Cars	Totals
0	0	0	0
3	6	500	509
3	6	500	

Cars	Trucks	Heavys	Totals
178	1	1	180

Peds Cross: ⧗
West Peds: 0
West Entering: 509
West Leg Total: 843

Cars	627
Trucks	8
Heavys	4
Totals	639

Cars	327	178	505
Trucks	5	1	6
Heavys	2	1	3
Totals	334	180	

Peds Cross: ⋈
South Peds: 318
South Entering: 514
South Leg Total: 1153

Comments

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Accu-Traffic Inc.
Traffic Count Summary

Intersection Finch Ave W & Pelican Gate | **Count Date** 13-May-14 | **Municipality** Toronto

North Approach Totals							South Approach Totals					
	Includes Cars, Trucks, & Heavys							Includes Cars, Trucks, & Heavys				
Hour Ending	Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches	Hour Ending	Left	Thru	Right	Grand Total	Total Peds
5:00:00	0	0	0	0	0	0	5:00:00	0	0	0	0	2
6:00:00	0	0	0	0	0	31	6:00:00	25	0	6	31	1
7:00:00	0	0	0	0	6	63	7:00:00	47	0	16	63	10
8:00:00	0	0	0	0	10	78	8:00:00	57	0	21	78	19
9:00:00	0	0	0	0	58	94	9:00:00	62	0	32	94	93
16:00:00	0	0	0	0	1	1	16:00:00	1	0	0	1	0
17:00:00	0	0	0	0	45	123	17:00:00	70	0	53	123	83
18:00:00	0	0	0	0	37	86	18:00:00	46	0	40	86	63
Totals:	0	0	0	0	157	476		308	0	168	476	271

East Approach Totals							West Approach Totals					
	Includes Cars, Trucks, & Heavys							Includes Cars, Trucks, & Heavys				
Hour Ending	Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches	Hour Ending	Left	Thru	Right	Grand Total	Total Peds
5:00:00	0	0	0	0	0	0	5:00:00	0	0	0	0	0
6:00:00	3	0	0	3	0	13	6:00:00	0	0	10	10	0
7:00:00	7	0	0	7	0	58	7:00:00	0	0	51	51	0
8:00:00	25	0	0	25	0	119	8:00:00	0	0	94	94	0
9:00:00	27	0	0	27	0	150	9:00:00	0	0	123	123	0
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	31	0	0	31	0	118	17:00:00	0	0	87	87	0
18:00:00	26	0	0	26	0	131	18:00:00	0	0	105	105	0
Totals:	119	0	0	119	0	589		0	0	470	470	0

Calculated Values for Traffic Crossing Major Street

Hours Ending:	5:00	6:00	7:00	8:00	9:00	16:00	17:00	18:00
Crossing Values:	0	25	47	57	62	1	70	46

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Accu-Traffic Inc.

Count Date: 13-May-14 Site #: 1406100004

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
6:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1
6:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1
7:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	5
7:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	3
7:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	2
8:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0
8:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	3
8:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21	2
8:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35	14
9:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	39
9:00:56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	1
16:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75	0
16:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	89	14
16:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	95	6
16:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	113	18
17:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	120	7
17:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	126	6
17:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	138	12
17:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	149	11
18:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	157	8
18:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	166	9
18:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180	14
18:30:24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180	0

Accu-Traffic Inc.

Count Date: 13-May-14 **Site #: 1406100004**

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45:00	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00:00	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30:00	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45:00	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00:00	10	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	13	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	20	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	27	7	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	34	7	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15:00	38	4	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30:00	43	5	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45:00	50	7	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00:00	61	11	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00:56	61	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00:00	61	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15:00	67	6	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30:00	76	9	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45:00	85	9	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00:00	92	7	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15:00	94	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30:00	100	6	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0
17:45:00	108	8	0	0	0	0	2	0	0	0	0	0	1	1	0	0	0	0	0	0
18:00:00	116	8	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0
18:15:00	121	5	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0
18:30:00	127	6	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0
18:30:24	127	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0

Accu-Traffic Inc.

Count Date: 13-May-14 Site #: 1406100004

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
5:15:00	2	2	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0
5:30:00	7	5	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0
5:45:00	15	8	0	0	5	2	0	0	0	0	0	0	0	0	0	0	0	0	3	1
6:00:00	25	10	0	0	6	1	0	0	0	0	0	0	0	0	0	0	0	0	3	0
6:15:00	37	12	0	0	7	1	0	0	0	0	0	0	0	0	0	0	0	0	5	2
6:30:00	46	9	0	0	9	2	1	1	0	0	0	0	0	0	0	0	0	0	7	2
6:45:00	58	12	0	0	11	2	1	0	0	0	0	0	0	0	0	0	0	0	9	2
7:00:00	70	12	0	0	22	11	2	1	0	0	0	0	0	0	0	0	0	0	13	4
7:15:00	96	26	0	0	31	9	2	0	0	0	0	0	0	0	0	0	0	0	17	4
7:30:00	109	13	0	0	34	3	2	0	0	0	0	0	0	0	0	0	0	0	20	3
7:45:00	120	11	0	0	42	8	3	1	0	0	0	0	0	0	0	0	0	0	25	5
8:00:00	126	6	0	0	43	1	3	0	0	0	0	0	0	0	0	0	0	0	32	7
8:15:00	141	15	0	0	48	5	3	0	0	0	0	0	0	0	0	0	0	0	43	11
8:30:00	151	10	0	0	53	5	3	0	0	0	0	0	0	0	0	0	0	0	54	11
8:45:00	164	13	0	0	64	11	3	0	0	0	1	1	0	0	0	0	0	0	83	29
9:00:00	186	22	0	0	74	10	4	1	0	0	1	0	1	1	0	0	0	0	125	42
9:00:56	187	1	0	0	74	0	4	0	0	0	1	0	1	0	0	0	0	0	125	0
16:00:00	187	0	0	0	74	0	4	0	0	0	1	0	1	0	0	0	0	0	125	0
16:15:00	207	20	0	0	84	10	4	0	0	0	1	0	1	0	0	0	0	0	140	15
16:30:00	225	18	0	0	99	15	4	0	0	0	1	0	1	0	0	0	0	0	166	26
16:45:00	246	21	0	0	115	16	4	0	0	0	1	0	2	1	0	0	0	0	181	15
17:00:00	256	10	0	0	127	12	4	0	0	0	1	0	2	0	0	0	0	0	208	27
17:15:00	271	15	0	0	138	11	5	1	0	0	1	0	2	0	0	0	0	0	219	11
17:30:00	284	13	0	0	152	14	5	0	0	0	1	0	2	0	0	0	0	0	235	16
17:45:00	290	6	0	0	157	5	5	0	0	0	1	0	2	0	0	0	0	0	254	19
18:00:00	301	11	0	0	166	9	5	0	0	0	1	0	2	0	0	0	1	1	271	17
18:15:00	315	14	0	0	171	5	5	0	0	0	1	0	2	0	0	0	1	0	295	24
18:30:00	327	12	0	0	178	7	5	0	0	0	1	0	2	0	0	0	1	0	318	23
18:30:24	327	0	0	0	178	0	5	0	0	0	1	0	2	0	0	0	1	0	318	0

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Accu-Traffic Inc.

Count Date: 13-May-14 **Site #: 1406100004**

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30:00	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45:00	0	0	0	0	5	2	0	0	0	0	1	1	0	0	0	0	0	0	0	0
6:00:00	0	0	0	0	9	4	0	0	0	0	1	0	0	0	0	0	0	0	0	0
6:15:00	0	0	0	0	11	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0
6:30:00	0	0	0	0	22	11	0	0	0	0	1	0	0	0	0	0	0	0	0	0
6:45:00	0	0	0	0	32	10	0	0	0	0	1	0	0	0	0	0	0	0	0	0
7:00:00	0	0	0	0	60	28	0	0	0	0	1	0	0	0	0	0	0	0	0	0
7:15:00	0	0	0	0	81	21	0	0	0	0	1	0	0	0	0	0	0	0	0	0
7:30:00	0	0	0	0	103	22	0	0	0	0	1	0	0	0	0	0	0	0	0	0
7:45:00	0	0	0	0	122	19	0	0	0	0	1	0	0	0	0	0	0	0	0	0
8:00:00	0	0	0	0	154	32	0	0	0	0	1	0	0	0	0	0	0	0	0	0
8:15:00	0	0	0	0	192	38	0	0	0	0	3	2	0	0	0	0	1	1	0	0
8:30:00	0	0	0	0	221	29	0	0	0	0	3	0	0	0	0	0	2	1	0	0
8:45:00	0	0	0	0	242	21	0	0	0	0	3	0	0	0	0	0	2	0	0	0
9:00:00	0	0	0	0	273	31	0	0	0	0	3	0	0	0	0	0	2	0	0	0
9:00:56	0	0	0	0	273	0	0	0	0	0	3	0	0	0	0	0	2	0	0	0
16:00:00	0	0	0	0	273	0	0	0	0	0	3	0	0	0	0	0	2	0	0	0
16:15:00	0	0	0	0	290	17	0	0	0	0	3	0	0	0	0	0	2	0	0	0
16:30:00	0	0	0	0	316	26	0	0	0	0	3	0	0	0	0	0	2	0	0	0
16:45:00	0	0	0	0	337	21	0	0	0	0	3	0	0	0	0	0	3	1	0	0
17:00:00	0	0	0	0	358	21	0	0	0	0	4	1	0	0	0	0	3	0	0	0
17:15:00	0	0	0	0	385	27	0	0	0	0	4	0	0	0	0	0	3	0	0	0
17:30:00	0	0	0	0	419	34	0	0	0	0	4	0	0	0	0	0	3	0	0	0
17:45:00	0	0	0	0	444	25	0	0	0	0	4	0	0	0	0	0	3	0	0	0
18:00:00	0	0	0	0	462	18	0	0	0	0	5	1	0	0	0	0	3	0	0	0
18:15:00	0	0	0	0	481	19	0	0	0	0	6	1	0	0	0	0	3	0	0	0
18:30:00	0	0	0	0	499	18	0	0	0	0	6	0	0	0	0	0	3	0	0	0
18:30:24	0	0	0	0	500	1	0	0	0	0	6	0	0	0	0	0	3	0	0	0

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Morning Peak Diagram

Specified Period		**One Hour Peak**	
From:	5:00:00	**From:**	8:00:00
To:	9:00:00	**To:**	9:00:00

Municipality: Toronto
Site #: 1406100005
Intersection: Finch Ave W & Elana Dr / York Gat
TFR File #: 2
Count date: 13-May-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

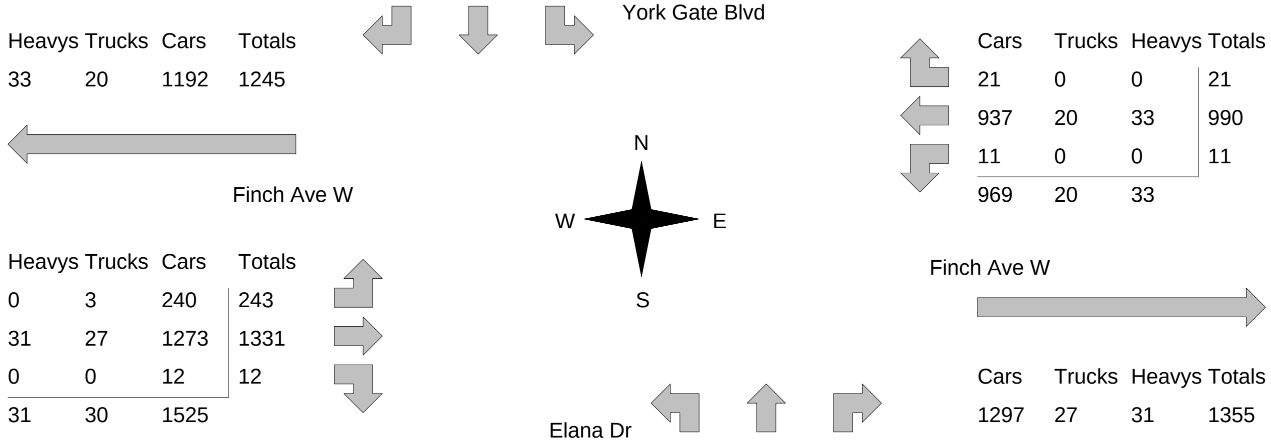
Major Road: Finch Ave W runs W/E

North Leg Total:	499
North Entering:	235
North Peds:	38
Peds Cross:	⋈

Heavys	0	0	0	0
Trucks	0	0	0	0
Cars	228	0	7	235
Totals	228	0	7	

Heavys	0
Trucks	3
Cars	261
Totals	264

East Leg Total:	2377
East Entering:	1022
East Peds:	36
Peds Cross:	⧗



Heavys	Trucks	Cars	Totals
33	20	1192	1245

Cars	Trucks	Heavys	Totals
21	0	0	21
937	20	33	990
11	0	0	11
969	20	33	

Heavys	Trucks	Cars	Totals
0	3	240	243
31	27	1273	1331
0	0	12	12
31	30	1525	

Cars	Trucks	Heavys	Totals
1297	27	31	1355

Peds Cross:	⧗
West Peds:	20
West Entering:	1586
West Leg Total:	2831

Cars	23
Trucks	0
Heavys	0
Totals	23

Cars	27	0	17	44
Trucks	0	0	0	0
Heavys	0	0	0	0
Totals	27	0	17	

Peds Cross:	⋈
South Peds:	86
South Entering:	44
South Leg Total:	67

Comments

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Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:30:00

One Hour Peak
From: 16:45:00
To: 17:45:00

Municipality: Toronto
Site #: 1406100005
Intersection: Finch Ave W & Elana Dr / York Gate
TFR File #: 2
Count date: 13-May-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Finch Ave W runs W/E

North Leg Total: 799
North Entering: 445
North Peds: 30
Peds Cross: ⋈

Heavys	1	0	0	1
Trucks	5	0	0	5
Cars	379	0	60	439
Totals	385	0	60	

Heavys	2
Trucks	3
Cars	349
Totals	354

East Leg Total: 2787
East Entering: 1356
East Peds: 98
Peds Cross: ⧗

York Gate Blvd

Heavys	Trucks	Cars	Totals
19	22	1715	1756

Cars	Trucks	Heavys	Totals
28	1	2	31
1283	16	18	1317
8	0	0	8
1319	17	20	

Finch Ave W

N
W E
S

Heavys	Trucks	Cars	Totals
0	2	321	323
28	15	1308	1351
0	0	7	7
28	17	1636	

Finch Ave W

Cars	Trucks	Heavys	Totals
1388	15	28	1431

Elana Dr

Peds Cross: ⧗
West Peds: 27
West Entering: 1681
West Leg Total: 3437

Cars	15
Trucks	0
Heavys	0
Totals	15

Cars	53	0	20	73
Trucks	1	0	0	1
Heavys	0	0	0	0
Totals	54	0	20	

Peds Cross: ⋈
South Peds: 130
South Entering: 74
South Leg Total: 89

Comments

Accu-Traffic Inc.

Total Count Diagram

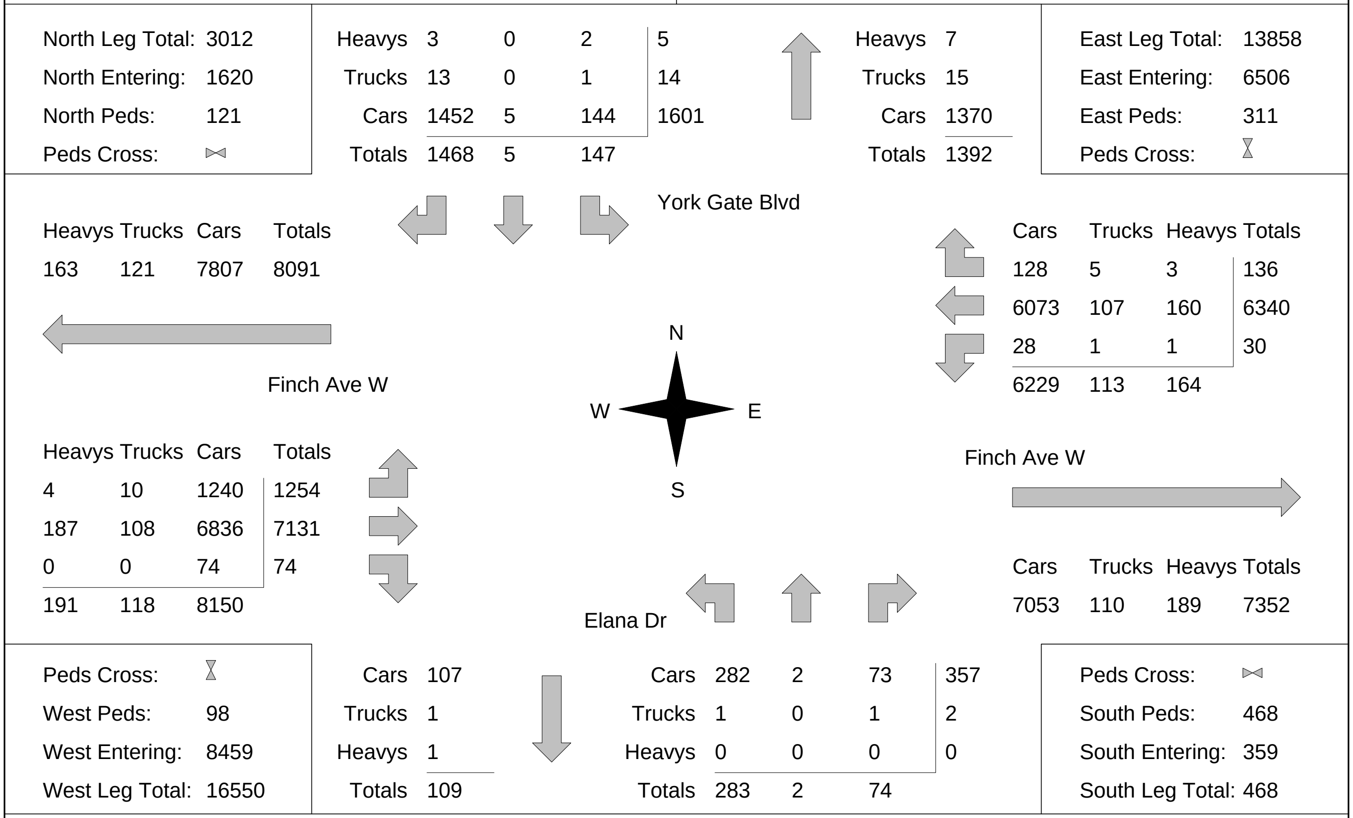
Municipality: Toronto
Site #: 1406100005
Intersection: Finch Ave W & Elana Dr / York Gate
TFR File #: 2
Count date: 13-May-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Finch Ave W runs W/E



North Leg Total:	3012
North Entering:	1620
North Peds:	121
Peds Cross:	⋈

Heavys	3	0	2	5
Trucks	13	0	1	14
Cars	1452	5	144	1601
Totals	1468	5	147	

Heavys	7
Trucks	15
Cars	1370
Totals	1392

East Leg Total:	13858
East Entering:	6506
East Peds:	311
Peds Cross:	⧗

York Gate Blvd

Heavys	Trucks	Cars	Totals
163	121	7807	8091

Cars	Trucks	Heavys	Totals
128	5	3	136
6073	107	160	6340
28	1	1	30
6229	113	164	

Finch Ave W

Heavys	Trucks	Cars	Totals
4	10	1240	1254
187	108	6836	7131
0	0	74	74
191	118	8150	

Finch Ave W

Cars	Trucks	Heavys	Totals
7053	110	189	7352

Elana Dr

Peds Cross:	⧗
West Peds:	98
West Entering:	8459
West Leg Total:	16550

Cars	107
Trucks	1
Heavys	1
Totals	109

Cars	282	2	73	357
Trucks	1	0	1	2
Heavys	0	0	0	0
Totals	283	2	74	

Peds Cross:	⋈
South Peds:	468
South Entering:	359
South Leg Total:	468

Comments

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Accu-Traffic Inc.
Traffic Count Summary

Intersection Finch Ave W & Elana Dr / York Ga **Count Date** 13-May-14 **Municipality** Toronto

North Approach Totals							South Approach Totals					
	Includes Cars, Trucks, & Heavys							Includes Cars, Trucks, & Heavys				
Hour Ending	Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches	Hour Ending	Left	Thru	Right	Grand Total	Total Peds
5:00:00	0	0	0	0	0	0	5:00:00	0	0	0	0	0
6:00:00	1	0	64	65	1	82	6:00:00	13	0	4	17	3
7:00:00	8	0	193	201	7	262	7:00:00	49	0	12	61	18
8:00:00	6	0	184	190	6	231	8:00:00	38	0	3	41	35
9:00:00	7	0	228	235	38	279	9:00:00	27	0	17	44	86
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	53	5	301	359	32	454	17:00:00	81	0	14	95	154
18:00:00	58	0	373	431	28	490	18:00:00	43	0	16	59	107
Totals:	133	5	1343	1481	112	1798		251	0	66	317	403

East Approach Totals							West Approach Totals					
	Includes Cars, Trucks, & Heavys							Includes Cars, Trucks, & Heavys				
Hour Ending	Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches	Hour Ending	Left	Thru	Right	Grand Total	Total Peds
5:00:00	0	0	0	0	0	0	5:00:00	0	0	0	0	0
6:00:00	0	317	5	322	4	690	6:00:00	24	339	5	368	3
7:00:00	2	770	9	781	7	1670	7:00:00	80	790	19	889	2
8:00:00	1	968	22	991	25	2387	8:00:00	113	1276	7	1396	4
9:00:00	11	990	21	1022	36	2608	9:00:00	243	1331	12	1586	20
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	5	1380	22	1407	99	3046	17:00:00	333	1297	9	1639	35
18:00:00	9	1322	36	1367	103	3053	18:00:00	304	1376	6	1686	20
Totals:	28	5747	115	5890	274	13454		1097	6409	58	7564	84

Calculated Values for Traffic Crossing Major Street

Hours Ending:	5:00	6:00	7:00	8:00	9:00	16:00	17:00	18:00
Crossing Values:	0	21	66	73	90	0	273	224

Accu-Traffic Inc.

Count Date: 13-May-14 **Site #: 1406100005**

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	0	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30:00	0	0	0	0	23	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45:00	0	0	0	0	38	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00:00	1	1	0	0	64	26	0	0	0	0	0	0	0	0	0	0	0	0	1	1
6:15:00	5	4	0	0	98	34	0	0	0	0	1	1	0	0	0	0	0	0	4	3
6:30:00	7	2	0	0	133	35	0	0	0	0	1	0	0	0	0	0	0	0	6	2
6:45:00	8	1	0	0	196	63	0	0	0	0	1	0	0	0	0	0	0	0	7	1
7:00:00	9	1	0	0	256	60	0	0	0	0	1	0	0	0	0	0	0	0	8	1
7:15:00	10	1	0	0	300	44	0	0	0	0	2	1	0	0	0	0	0	0	12	4
7:30:00	10	0	0	0	338	38	0	0	0	0	2	0	0	0	0	0	0	0	13	1
7:45:00	11	1	0	0	380	42	0	0	0	0	2	0	0	0	0	0	0	0	14	1
8:00:00	13	2	0	0	439	59	0	0	0	0	2	0	2	2	0	0	0	0	14	0
8:15:00	14	1	0	0	473	34	0	0	0	0	2	0	2	0	0	0	0	0	20	6
8:30:00	16	2	0	0	532	59	0	0	0	0	2	0	2	0	0	0	0	0	23	3
8:45:00	18	2	0	0	591	59	0	0	0	0	2	0	2	0	0	0	0	0	31	8
9:00:00	20	2	0	0	667	76	0	0	0	0	2	0	2	0	0	0	0	0	52	21
9:00:06	20	0	0	0	667	0	0	0	0	0	2	0	2	0	0	0	0	0	52	0
16:00:00	20	0	0	0	667	0	0	0	0	0	2	0	2	0	0	0	0	0	52	0
16:15:00	29	9	5	5	721	54	1	1	0	0	4	2	2	0	0	0	0	0	62	10
16:30:00	38	9	5	0	792	71	1	0	0	0	4	0	2	0	0	0	0	0	69	7
16:45:00	60	22	5	0	878	86	1	0	0	0	5	1	2	0	0	0	0	0	78	9
17:00:00	72	12	5	0	964	86	1	0	0	0	6	1	2	0	0	0	0	0	84	6
17:15:00	90	18	5	0	1057	93	1	0	0	0	6	0	2	0	0	0	0	0	94	10
17:30:00	100	10	5	0	1163	106	1	0	0	0	10	4	2	0	0	0	1	1	100	6
17:45:00	120	20	5	0	1257	94	1	0	0	0	10	0	2	0	0	0	1	0	108	8
18:00:00	130	10	5	0	1332	75	1	0	0	0	10	0	2	0	0	0	1	0	112	4
18:15:00	138	8	5	0	1388	56	1	0	0	0	10	0	2	0	0	0	1	0	117	5
18:30:00	144	6	5	0	1452	64	1	0	0	0	13	3	2	0	0	0	3	2	121	4
18:45:00	144	0	5	0	1452	0	1	0	0	0	13	0	2	0	0	0	3	0	121	0
18:45:15	144	0	5	0	1452	0	1	0	0	0	13	0	2	0	0	0	3	0	121	0

Accu-Traffic Inc.

Count Date: 13-May-14 Site #: 1406100005

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	0	0	59	59	0	0	0	0	1	1	0	0	0	0	3	3	0	0	0	0
5:30:00	0	0	109	50	1	1	0	0	3	2	0	0	0	0	6	3	0	0	2	2
5:45:00	0	0	193	84	3	2	0	0	3	0	0	0	0	0	9	3	0	0	3	1
6:00:00	0	0	297	104	4	1	0	0	5	2	0	0	0	0	15	6	1	1	4	1
6:15:00	1	1	435	138	4	0	0	0	9	4	0	0	1	1	19	4	1	0	5	1
6:30:00	1	0	608	173	5	1	0	0	10	1	0	0	1	0	24	5	1	0	8	3
6:45:00	1	0	817	209	9	4	0	0	12	2	0	0	1	0	32	8	1	0	9	1
7:00:00	1	0	1034	217	13	4	0	0	16	4	0	0	1	0	37	5	1	0	11	2
7:15:00	1	0	1253	219	23	10	0	0	18	2	0	0	1	0	45	8	1	0	18	7
7:30:00	2	1	1462	209	28	5	0	0	24	6	0	0	1	0	54	9	1	0	20	2
7:45:00	2	0	1710	248	33	5	0	0	30	6	0	0	1	0	63	9	1	0	24	4
8:00:00	2	0	1945	235	35	2	0	0	37	7	0	0	1	0	73	10	1	0	36	12
8:15:00	4	2	2150	205	36	1	0	0	43	6	0	0	1	0	81	8	1	0	44	8
8:30:00	9	5	2410	260	49	13	0	0	48	5	0	0	1	0	87	6	1	0	48	4
8:45:00	12	3	2635	225	52	3	0	0	51	3	0	0	1	0	97	10	1	0	59	11
9:00:00	13	1	2882	247	56	4	0	0	57	6	0	0	1	0	106	9	1	0	72	13
9:00:06	13	0	2882	0	56	0	0	0	57	0	0	0	1	0	106	0	1	0	72	0
16:00:00	13	0	2882	0	56	0	0	0	57	0	0	0	1	0	106	0	1	0	72	0
16:15:00	15	2	3227	345	61	5	0	0	63	6	0	0	1	0	112	6	1	0	98	26
16:30:00	15	0	3584	357	64	3	0	0	70	7	1	1	1	0	116	4	1	0	128	30
16:45:00	17	2	3906	322	66	2	0	0	74	4	3	2	1	0	123	7	1	0	150	22
17:00:00	18	1	4218	312	74	8	0	0	79	5	3	0	1	0	128	5	2	1	171	21
17:15:00	22	4	4532	314	79	5	0	0	82	3	3	0	1	0	131	3	3	1	200	29
17:30:00	24	2	4858	326	86	7	0	0	86	4	3	0	1	0	136	5	3	0	220	20
17:45:00	25	1	5189	331	94	8	0	0	90	4	4	1	1	0	141	5	3	0	248	28
18:00:00	27	2	5503	314	108	14	0	0	96	6	4	0	1	0	148	7	3	0	274	26
18:15:00	27	0	5805	302	122	14	1	1	98	2	4	0	1	0	154	6	3	0	292	18
18:30:00	28	1	6073	268	128	6	1	0	107	9	5	1	1	0	160	6	3	0	311	19
18:45:00	28	0	6073	0	128	0	1	0	107	0	5	0	1	0	160	0	3	0	311	0
18:45:15	28	0	6073	0	128	0	1	0	107	0	5	0	1	0	160	0	3	0	311	0

Accu-Traffic Inc.

Count Date: 13-May-14 **Site #: 1406100005**

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30:00	2	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
5:45:00	6	4	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	3	1
6:00:00	13	7	0	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0	3	0
6:15:00	20	7	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	7	4
6:30:00	29	9	0	0	10	6	0	0	0	0	0	0	0	0	0	0	0	0	13	6
6:45:00	45	16	0	0	12	2	0	0	0	0	0	0	0	0	0	0	0	0	16	3
7:00:00	62	17	0	0	16	4	0	0	0	0	0	0	0	0	0	0	0	0	21	5
7:15:00	74	12	0	0	17	1	0	0	0	0	0	0	0	0	0	0	0	0	27	6
7:30:00	83	9	0	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	30	3
7:45:00	92	9	0	0	18	1	0	0	0	0	0	0	0	0	0	0	0	0	41	11
8:00:00	100	8	0	0	19	1	0	0	0	0	0	0	0	0	0	0	0	0	56	15
8:15:00	105	5	0	0	22	3	0	0	0	0	0	0	0	0	0	0	0	0	70	14
8:30:00	113	8	0	0	25	3	0	0	0	0	0	0	0	0	0	0	0	0	79	9
8:45:00	117	4	0	0	32	7	0	0	0	0	0	0	0	0	0	0	0	0	108	29
9:00:00	127	10	0	0	36	4	0	0	0	0	0	0	0	0	0	0	0	0	142	34
9:00:06	127	0	0	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	142	0
16:00:00	127	0	0	0	36	0	0	0	0	0	0	0	0	0	0	0	0	0	142	0
16:15:00	148	21	0	0	39	3	0	0	0	0	0	0	0	0	0	0	0	0	184	42
16:30:00	180	32	0	0	42	3	0	0	0	0	0	0	0	0	0	0	0	0	217	33
16:45:00	194	14	0	0	44	2	0	0	0	0	0	0	0	0	0	0	0	0	249	32
17:00:00	208	14	0	0	50	6	0	0	0	0	0	0	0	0	0	0	0	0	296	47
17:15:00	218	10	0	0	54	4	0	0	0	0	0	0	0	0	0	0	0	0	333	37
17:30:00	238	20	0	0	60	6	1	1	0	0	0	0	0	0	0	0	0	0	357	24
17:45:00	247	9	0	0	64	4	1	0	0	0	0	0	0	0	0	0	0	0	379	22
18:00:00	250	3	0	0	66	2	1	0	0	0	0	0	0	0	0	0	0	0	403	24
18:15:00	262	12	2	2	71	5	1	0	0	0	0	0	0	0	0	0	0	0	439	36
18:30:00	282	20	2	0	73	2	1	0	0	0	1	1	0	0	0	0	0	0	468	29
18:45:00	282	0	2	0	73	0	1	0	0	0	1	0	0	0	0	0	0	0	468	0
18:45:15	282	0	2	0	73	0	1	0	0	0	1	0	0	0	0	0	0	0	468	0

Accu-Traffic Inc.

Count Date: 13-May-14 Site #: 1406100005

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	3	3	52	52	2	2	0	0	0	0	0	0	0	0	6	6	0	0	0	0
5:30:00	7	4	109	57	3	1	0	0	1	1	0	0	0	0	13	7	0	0	1	1
5:45:00	17	10	192	83	3	0	0	0	2	1	0	0	0	0	20	7	0	0	2	1
6:00:00	24	7	308	116	5	2	0	0	4	2	0	0	0	0	27	7	0	0	3	1
6:15:00	38	14	437	129	8	3	0	0	5	1	0	0	0	0	35	8	0	0	4	1
6:30:00	53	15	618	181	18	10	0	0	6	1	0	0	0	0	41	6	0	0	5	1
6:45:00	74	21	844	226	20	2	0	0	12	6	0	0	0	0	49	8	0	0	5	0
7:00:00	104	30	1059	215	24	4	0	0	15	3	0	0	0	0	55	6	0	0	5	0
7:15:00	124	20	1290	231	29	5	0	0	22	7	0	0	0	0	72	17	0	0	6	1
7:30:00	151	27	1605	315	29	0	0	0	29	7	0	0	0	0	82	10	0	0	6	0
7:45:00	171	20	1957	352	29	0	0	0	37	8	0	0	1	1	90	8	0	0	7	1
8:00:00	214	43	2265	308	31	2	2	2	43	6	0	0	1	0	97	7	0	0	9	2
8:15:00	273	59	2610	345	33	2	2	0	48	5	0	0	1	0	104	7	0	0	11	2
8:30:00	327	54	2905	295	40	7	4	2	58	10	0	0	1	0	115	11	0	0	14	3
8:45:00	377	50	3227	322	40	0	4	0	64	6	0	0	1	0	121	6	0	0	22	8
9:00:00	454	77	3538	311	43	3	5	1	70	6	0	0	1	0	128	7	0	0	29	7
9:00:06	454	0	3538	0	43	0	5	0	70	0	0	0	1	0	128	0	0	0	29	0
16:00:00	454	0	3538	0	43	0	5	0	70	0	0	0	1	0	128	0	0	0	29	0
16:15:00	534	80	3808	270	44	1	5	0	77	7	0	0	2	1	131	3	0	0	32	3
16:30:00	613	79	4145	337	48	4	6	1	82	5	0	0	2	0	139	8	0	0	41	9
16:45:00	688	75	4464	319	50	2	6	0	86	4	0	0	4	2	145	6	0	0	54	13
17:00:00	783	95	4790	326	52	2	6	0	91	5	0	0	4	0	152	7	0	0	64	10
17:15:00	857	74	5125	335	55	3	6	0	94	3	0	0	4	0	157	5	0	0	67	3
17:30:00	939	82	5455	330	56	1	6	0	97	3	0	0	4	0	164	7	0	0	74	7
17:45:00	1009	70	5772	317	57	1	8	2	101	4	0	0	4	0	173	9	0	0	81	7
18:00:00	1085	76	6129	357	58	1	8	0	103	2	0	0	4	0	177	4	0	0	84	3
18:15:00	1165	80	6490	361	64	6	10	2	105	2	0	0	4	0	184	7	0	0	95	11
18:30:00	1240	75	6836	346	74	10	10	0	108	3	0	0	4	0	187	3	0	0	98	3
18:45:00	1240	0	6836	0	74	0	10	0	108	0	0	0	4	0	187	0	0	0	98	0
18:45:15	1240	0	6836	0	74	0	10	0	108	0	0	0	4	0	187	0	0	0	98	0

Accu-Traffic Inc.
Traffic Monitoring & Data Analysis
www.accu-traffic.ca
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Accu-Traffic Inc.

Morning Peak Diagram

Specified Period
From: 5:00:00
To: 9:00:00

One Hour Peak
From: 8:00:00
To: 9:00:00

Municipality: Toronto
Site #: 1406100006
Intersection: Finch Ave W Jane St & Jane St
TFR File #: 1
Count date: 13-May-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Finch Ave W Jane St runs W/E

North Leg Total: 1670
North Entering: 974
North Peds: 40
Peds Cross: ⋈

Heavys	7	11	1	19
Trucks	8	19	2	29
Cars	94	603	229	926
Totals	109	633	232	
	↲	↓	↳	

↑

Heavys	12
Trucks	5
Cars	679
Totals	696

East Leg Total: 2109
East Entering: 866
East Peds: 33
Peds Cross: ⧗

Jane St

Heavys	Trucks	Cars	Totals
33	20	927	980

←

Finch Ave W Jane St

	Cars	Trucks	Heavys	Totals
↰	65	2	0	67
←	638	8	21	667
↓	125	7	0	132
	828	17	21	

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W E
S

Heavys	Trucks	Cars	Totals	
0	3	166	169	↱
30	11	906	947	→
1	9	187	197	↓
31	23	1259		

Finch Ave W Jane St

→

Cars	Trucks	Heavys	Totals
1199	13	31	1243

Jane St

Peds Cross: ⧗
West Peds: 31
West Entering: 1313
West Leg Total: 2293

↓

Cars	915
Trucks	35
Heavys	12
Totals	962

	↰	↑	↱	
Cars	195	448	64	707
Trucks	4	0	0	4
Heavys	5	12	0	17
Totals	204	460	64	

Peds Cross: ⋈
South Peds: 50
South Entering: 728
South Leg Total: 1690

Comments

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Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:30:00

One Hour Peak
From: 17:15:00
To: 18:15:00

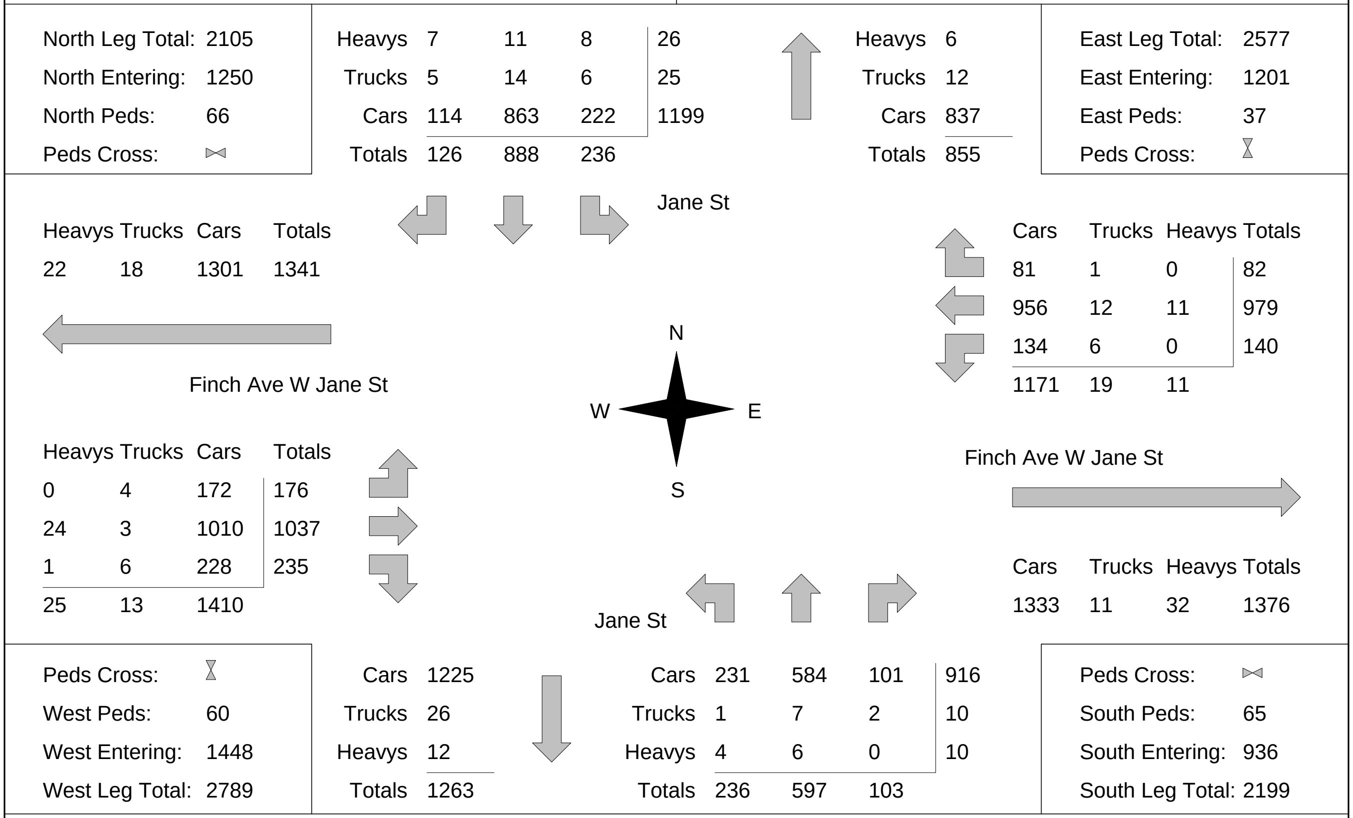
Municipality: Toronto
Site #: 1406100006
Intersection: Finch Ave W Jane St & Jane St
TFR File #: 1
Count date: 13-May-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Finch Ave W Jane St runs W/E



North Leg Total: 2105
North Entering: 1250
North Peds: 66
Peds Cross: ⋈

Heavys	7	11	8	26
Trucks	5	14	6	25
Cars	114	863	222	1199
Totals	126	888	236	

Heavys	6
Trucks	12
Cars	837
Totals	855

East Leg Total: 2577
East Entering: 1201
East Peds: 37
Peds Cross: ⧗

Jane St

Heavys	Trucks	Cars	Totals
22	18	1301	1341

Cars	Trucks	Heavys	Totals
81	1	0	82
956	12	11	979
134	6	0	140
1171	19	11	

Finch Ave W Jane St

Heavys	Trucks	Cars	Totals
0	4	172	176
24	3	1010	1037
1	6	228	235
25	13	1410	

Finch Ave W Jane St

Cars	Trucks	Heavys	Totals
1333	11	32	1376

Jane St

Peds Cross: ⧗
West Peds: 60
West Entering: 1448
West Leg Total: 2789

Cars	1225
Trucks	26
Heavys	12
Totals	1263

Cars	231	584	101	916
Trucks	1	7	2	10
Heavys	4	6	0	10
Totals	236	597	103	

Peds Cross: ⋈
South Peds: 65
South Entering: 936
South Leg Total: 2199

Comments

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Accu-Traffic Inc.

Total Count Diagram

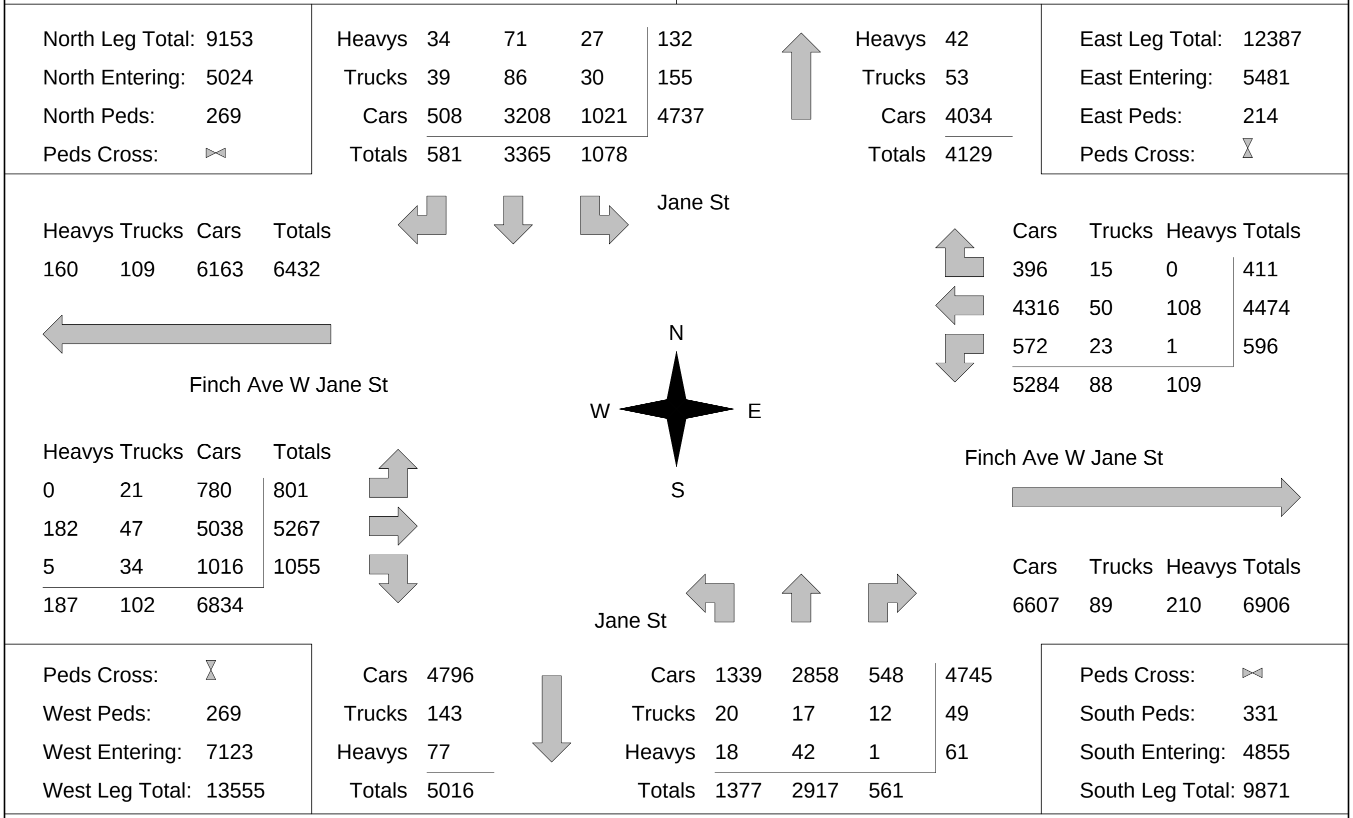
Municipality: Toronto
Site #: 1406100006
Intersection: Finch Ave W Jane St & Jane St
TFR File #: 1
Count date: 13-May-14

Weather conditions:

Person(s) who counted:

**** Signalized Intersection ****

Major Road: Finch Ave W Jane St runs W/E



North Leg Total:	9153
North Entering:	5024
North Peds:	269
Peds Cross:	⋈

Heavys	34	71	27	132
Trucks	39	86	30	155
Cars	508	3208	1021	4737
Totals	581	3365	1078	

Heavys	42
Trucks	53
Cars	4034
Totals	4129

East Leg Total:	12387
East Entering:	5481
East Peds:	214
Peds Cross:	⧗

Jane St

Heavys	Trucks	Cars	Totals
160	109	6163	6432

Finch Ave W Jane St

Cars	Trucks	Heavys	Totals
396	15	0	411
4316	50	108	4474
572	23	1	596
5284	88	109	

N
W
E
S

Heavys	Trucks	Cars	Totals
0	21	780	801
182	47	5038	5267
5	34	1016	1055
187	102	6834	

Finch Ave W Jane St

Cars	Trucks	Heavys	Totals
6607	89	210	6906

Jane St

Peds Cross:	⧗
West Peds:	269
West Entering:	7123
West Leg Total:	13555

Cars	4796
Trucks	143
Heavys	77
Totals	5016

Cars	1339	2858	548	4745
Trucks	20	17	12	49
Heavys	18	42	1	61
Totals	1377	2917	561	

Peds Cross:	⋈
South Peds:	331
South Entering:	4855
South Leg Total:	9871

Comments

Accu-Traffic Inc.
Traffic Count Summary

Intersection: Finch Ave W Jane St & Jane St | **Count Date:** 13-May-14 | **Municipality:** Toronto

North Approach Totals							South Approach Totals					
	Includes Cars, Trucks, & Heavys					North/South Total Approaches		Includes Cars, Trucks, & Heavys				
Hour Ending	Left	Thru	Right	Grand Total	Total Peds		Hour Ending	Left	Thru	Right	Grand Total	Total Peds
5:00:00	0	0	0	0	0	0	5:00:00	0	0	0	0	0
6:00:00	28	87	24	139	17	501	6:00:00	116	200	46	362	26
7:00:00	78	223	58	359	23	1124	7:00:00	241	444	80	765	49
8:00:00	166	485	78	729	32	1523	8:00:00	273	438	83	794	53
9:00:00	232	633	109	974	40	1702	9:00:00	204	460	64	728	50
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	214	754	127	1095	61	1938	17:00:00	195	520	128	843	61
18:00:00	243	868	128	1239	63	2159	18:00:00	228	580	112	920	66
Totals:	961	3050	524	4535	236	8947		1257	2642	513	4412	305

East Approach Totals							West Approach Totals					
	Includes Cars, Trucks, & Heavys					East/West Total Approaches		Includes Cars, Trucks, & Heavys				
Hour Ending	Left	Thru	Right	Grand Total	Total Peds		Hour Ending	Left	Thru	Right	Grand Total	Total Peds
5:00:00	0	0	0	0	0	0	5:00:00	0	0	0	0	0
6:00:00	18	182	31	231	22	541	6:00:00	32	223	55	310	29
7:00:00	45	481	46	572	24	1346	7:00:00	88	602	84	774	32
8:00:00	88	647	48	783	38	2020	8:00:00	119	952	166	1237	38
9:00:00	132	667	67	866	33	2179	9:00:00	169	947	197	1313	31
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	118	1081	90	1289	39	2640	17:00:00	137	987	227	1351	58
18:00:00	150	976	89	1215	39	2625	18:00:00	176	1020	214	1410	58
Totals:	551	4034	371	4956	195	11351		721	4731	943	6395	246

Calculated Values for Traffic Crossing Major Street

Hours Ending:	5:00	6:00	7:00	8:00	9:00	16:00	17:00	18:00
Crossing Values:	0	395	819	1000	1133	0	1260	1436

Accu-Traffic Inc.

Count Date: 13-May-14 Site #: 1406100006

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	1	1	17	17	4	4	0	0	0	0	0	0	0	0	2	2	0	0	4	4
5:30:00	6	5	27	10	7	3	1	1	0	0	0	0	0	0	2	0	0	0	8	4
5:45:00	15	9	45	18	16	9	1	0	1	1	0	0	0	0	3	1	0	0	14	6
6:00:00	26	11	80	35	24	8	1	0	2	1	0	0	1	1	5	2	0	0	17	3
6:15:00	38	12	121	41	29	5	3	2	4	2	2	2	2	1	6	1	0	0	21	4
6:30:00	52	14	166	45	44	15	4	1	7	3	2	0	2	0	9	3	0	0	27	6
6:45:00	68	16	205	39	62	18	4	0	11	4	2	0	4	2	14	5	1	1	31	4
7:00:00	96	28	279	74	77	15	5	1	13	2	2	0	5	1	18	4	3	2	40	9
7:15:00	133	37	369	90	88	11	7	2	16	3	3	1	5	0	20	2	4	1	48	8
7:30:00	175	42	481	112	106	18	8	1	20	4	7	4	6	1	22	2	5	1	55	7
7:45:00	214	39	606	125	121	15	8	0	22	2	12	5	6	0	25	3	7	2	64	9
8:00:00	255	41	742	136	138	17	9	1	26	4	14	2	8	2	27	2	8	1	72	8
8:15:00	307	52	900	158	155	17	9	0	29	3	17	3	8	0	31	4	10	2	79	7
8:30:00	366	59	1063	163	181	26	10	1	33	4	19	2	9	1	33	2	11	1	88	9
8:45:00	423	57	1220	157	204	23	10	0	38	5	20	1	9	0	35	2	14	3	99	11
9:00:00	484	61	1345	125	232	28	11	1	45	7	22	2	9	0	38	3	15	1	112	13
9:15:00	484	0	1345	0	232	0	11	0	45	0	22	0	9	0	38	0	15	0	112	0
16:00:00	484	0	1345	0	232	0	11	0	45	0	22	0	9	0	38	0	15	0	112	0
16:15:00	536	52	1524	179	254	22	14	3	48	3	23	1	11	2	43	5	18	3	127	15
16:30:00	589	53	1712	188	290	36	15	1	52	4	25	2	12	1	47	4	20	2	143	16
16:45:00	636	47	1895	183	324	34	17	2	56	4	28	3	14	2	51	4	21	1	157	14
17:00:00	684	48	2067	172	341	17	19	2	61	5	30	2	15	1	54	3	25	4	173	16
17:15:00	738	54	2213	146	369	28	23	4	64	3	31	1	18	3	57	3	26	1	186	13
17:30:00	794	56	2462	249	390	21	25	2	68	4	32	1	20	2	59	2	28	2	207	21
17:45:00	855	61	2664	202	428	38	28	3	72	4	33	1	22	2	64	5	29	1	222	15
18:00:00	909	54	2912	248	457	29	29	1	72	0	35	2	23	1	66	2	32	3	236	14
18:15:00	960	51	3076	164	483	26	29	0	78	6	36	1	26	3	68	2	33	1	252	16
18:30:00	1021	61	3208	132	508	25	30	1	86	8	39	3	27	1	71	3	34	1	269	17
18:45:00	1021	0	3208	0	508	0	30	0	86	0	39	0	27	0	71	0	34	0	269	0
18:45:15	1021	0	3208	0	508	0	30	0	86	0	39	0	27	0	71	0	34	0	269	0

Accu-Traffic Inc.

Count Date: 13-May-14 Site #: 1406100006

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	5	5	38	38	7	7	0	0	0	0	0	0	0	0	4	4	0	0	3	3
5:30:00	7	2	67	29	12	5	0	0	2	2	0	0	0	0	7	3	0	0	5	2
5:45:00	11	4	103	36	20	8	0	0	2	0	0	0	0	0	10	3	0	0	13	8
6:00:00	18	7	161	58	31	11	0	0	4	2	0	0	0	0	17	7	0	0	22	9
6:15:00	31	13	239	78	40	9	1	1	5	1	0	0	0	0	22	5	0	0	23	1
6:30:00	40	9	340	101	53	13	1	0	6	1	0	0	0	0	27	5	0	0	29	6
6:45:00	48	8	481	141	64	11	2	1	7	1	1	1	0	0	33	6	0	0	38	9
7:00:00	61	13	618	137	76	12	2	0	9	2	1	0	0	0	36	3	0	0	46	8
7:15:00	77	16	761	143	88	12	3	1	10	1	2	1	0	0	42	6	0	0	53	7
7:30:00	92	15	899	138	103	15	3	0	13	3	2	0	0	0	50	8	0	0	62	9
7:45:00	116	24	1078	179	116	13	3	0	13	0	2	0	0	0	56	6	0	0	71	9
8:00:00	145	29	1232	154	123	7	5	2	15	2	2	0	1	1	63	7	0	0	84	13
8:15:00	172	27	1372	140	138	15	7	2	16	1	3	1	1	0	68	5	0	0	92	8
8:30:00	203	31	1546	174	154	16	8	1	18	2	3	0	1	0	71	3	0	0	101	9
8:45:00	238	35	1712	166	170	16	11	3	20	2	3	0	1	0	77	6	0	0	110	9
9:00:00	270	32	1870	158	188	18	12	1	23	3	4	1	1	0	84	7	0	0	117	7
9:15:00	270	0	1870	0	188	0	12	0	23	0	4	0	1	0	84	0	0	0	117	0
16:00:00	270	0	1870	0	188	0	12	0	23	0	4	0	1	0	84	0	0	0	117	0
16:15:00	298	28	2156	286	209	21	13	1	27	4	5	1	1	0	86	2	0	0	126	9
16:30:00	323	25	2427	271	228	19	14	1	29	2	7	2	1	0	86	0	0	0	135	9
16:45:00	351	28	2678	251	245	17	15	1	31	2	8	1	1	0	89	3	0	0	148	13
17:00:00	385	34	2934	256	272	27	15	0	33	2	10	2	1	0	91	2	0	0	156	8
17:15:00	419	34	3166	232	299	27	17	2	33	0	13	3	1	0	92	1	0	0	171	15
17:30:00	455	36	3410	244	315	16	19	2	34	1	13	0	1	0	96	4	0	0	180	9
17:45:00	492	37	3658	248	333	18	21	2	38	4	14	1	1	0	99	3	0	0	187	7
18:00:00	528	36	3893	235	357	24	22	1	42	4	14	0	1	0	99	0	0	0	195	8
18:15:00	553	25	4122	229	380	23	23	1	45	3	14	0	1	0	103	4	0	0	208	13
18:30:00	572	19	4316	194	396	16	23	0	50	5	15	1	1	0	108	5	0	0	214	6
18:45:00	572	0	4316	0	396	0	23	0	50	0	15	0	1	0	108	0	0	0	214	0
18:45:15	572	0	4316	0	396	0	23	0	50	0	15	0	1	0	108	0	0	0	214	0

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Count Date: 13-May-14 **Site #: 1406100006**

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	14	14	29	29	3	3	1	1	0	0	0	0	0	0	0	0	0	0	6	6
5:30:00	35	21	69	40	14	11	1	0	0	0	0	0	0	0	0	0	0	0	12	6
5:45:00	69	34	126	57	29	15	1	0	0	0	0	0	0	0	0	0	0	0	18	6
6:00:00	115	46	199	73	46	17	1	0	0	0	0	0	0	0	1	1	0	0	26	8
6:15:00	171	56	295	96	60	14	2	1	1	1	0	0	0	0	1	0	0	0	35	9
6:30:00	226	55	408	113	79	19	3	1	1	0	0	0	0	0	2	1	0	0	46	11
6:45:00	285	59	543	135	102	23	3	0	2	1	0	0	1	1	3	1	0	0	60	14
7:00:00	351	66	638	95	126	24	5	2	3	1	0	0	1	0	3	0	0	0	75	15
7:15:00	438	87	745	107	146	20	6	1	3	0	1	1	2	1	4	1	0	0	88	13
7:30:00	505	67	855	110	172	26	6	0	4	1	1	0	2	0	5	1	0	0	100	12
7:45:00	566	61	961	106	195	23	7	1	4	0	2	1	3	1	7	2	0	0	114	14
8:00:00	616	50	1069	108	203	8	9	2	5	1	5	3	5	2	8	1	1	1	128	14
8:15:00	662	46	1180	111	216	13	10	1	5	0	5	0	6	1	10	2	1	0	144	16
8:30:00	720	58	1311	131	231	15	11	1	5	0	5	0	8	2	13	3	1	0	157	13
8:45:00	762	42	1413	102	250	19	11	0	5	0	5	0	9	1	15	2	1	0	169	12
9:00:00	811	49	1517	104	267	17	13	2	5	0	5	0	10	1	20	5	1	0	178	9
9:15:00	811	0	1517	0	267	0	13	0	5	0	5	0	10	0	20	0	1	0	178	0
16:00:00	811	0	1517	0	267	0	13	0	5	0	5	0	10	0	20	0	1	0	178	0
16:15:00	860	49	1642	125	299	32	13	0	6	1	5	0	11	1	21	1	1	0	193	15
16:30:00	911	51	1779	137	322	23	16	3	7	1	5	0	12	1	24	3	1	0	210	17
16:45:00	953	42	1903	124	353	31	17	1	9	2	6	1	13	1	29	5	1	0	225	15
17:00:00	999	46	2020	117	391	38	17	0	10	1	9	3	13	0	32	3	1	0	239	14
17:15:00	1051	52	2141	121	420	29	18	1	10	0	10	1	14	1	34	2	1	0	255	16
17:30:00	1105	54	2278	137	443	23	19	1	11	1	12	2	14	0	35	1	1	0	272	17
17:45:00	1160	55	2423	145	475	32	19	0	13	2	12	0	15	1	37	2	1	0	291	19
18:00:00	1221	61	2587	164	500	25	19	0	16	3	12	0	17	2	39	2	1	0	305	14
18:15:00	1282	61	2725	138	521	21	19	0	17	1	12	0	18	1	40	1	1	0	320	15
18:30:00	1339	57	2858	133	548	27	20	1	17	0	12	0	18	0	42	2	1	0	331	11
18:45:00	1339	0	2858	0	548	0	20	0	17	0	12	0	18	0	42	0	1	0	331	0
18:45:15	1339	0	2858	0	548	0	20	0	17	0	12	0	18	0	42	0	1	0	331	0

Accu-Traffic Inc.

Count Date: 13-May-14 **Site #: 1406100006**

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	7	7	40	40	8	8	0	0	0	0	0	0	0	0	6	6	0	0	3	3
5:30:00	13	6	74	34	22	14	0	0	1	1	0	0	0	0	13	7	0	0	12	9
5:45:00	22	9	127	53	39	17	0	0	2	1	0	0	0	0	20	7	0	0	20	8
6:00:00	32	10	192	65	55	16	0	0	4	2	0	0	0	0	27	7	0	0	29	9
6:15:00	43	11	296	104	70	15	0	0	5	1	0	0	0	0	35	8	0	0	36	7
6:30:00	64	21	439	143	87	17	1	1	5	0	0	0	0	0	41	6	0	0	42	6
6:45:00	98	34	601	162	111	24	2	1	6	1	1	1	0	0	49	8	0	0	50	8
7:00:00	117	19	762	161	138	27	3	1	8	2	1	0	0	0	55	6	0	0	61	11
7:15:00	133	16	943	181	172	34	4	1	11	3	4	3	0	0	71	16	1	1	68	7
7:30:00	164	31	1156	213	228	56	4	0	14	3	7	3	0	0	81	10	1	0	82	14
7:45:00	195	31	1436	280	260	32	5	1	18	4	10	3	0	0	89	8	1	0	91	9
8:00:00	233	38	1657	221	293	33	6	1	22	4	11	1	0	0	98	9	1	0	99	8
8:15:00	266	33	1909	252	332	39	6	0	25	3	12	1	0	0	105	7	1	0	106	7
8:30:00	308	42	2118	209	377	45	8	2	28	3	17	5	0	0	116	11	1	0	117	11
8:45:00	350	42	2352	234	420	43	8	0	30	2	19	2	0	0	122	6	1	0	130	13
9:00:00	399	49	2563	211	480	60	9	1	33	3	20	1	0	0	128	6	2	1	130	0
9:15:00	399	0	2563	0	480	0	9	0	33	0	20	0	0	0	128	6	2	0	130	0
16:00:00	399	0	2563	0	480	0	9	0	33	0	20	0	0	0	128	0	2	0	130	0
16:15:00	422	23	2774	211	531	51	10	1	39	6	20	0	0	0	131	3	2	0	144	14
16:30:00	457	35	3024	250	593	62	12	2	40	1	22	2	0	0	139	8	2	0	158	14
16:45:00	490	33	3286	262	641	48	13	1	41	1	24	2	0	0	145	6	2	0	174	16
17:00:00	530	40	3517	231	701	60	15	2	42	1	26	2	0	0	152	7	2	0	188	14
17:15:00	567	37	3769	252	740	39	16	1	43	1	27	1	0	0	155	3	4	2	200	12
17:30:00	615	48	4006	237	800	60	17	1	44	1	28	1	0	0	162	7	4	0	215	15
17:45:00	655	40	4252	246	847	47	19	2	44	0	30	2	0	0	170	8	4	0	231	16
18:00:00	701	46	4514	262	907	60	20	1	45	1	31	1	0	0	172	2	5	1	246	15
18:15:00	739	38	4779	265	968	61	20	0	46	1	33	2	0	0	179	7	5	0	260	14
18:30:00	780	41	5038	259	1016	48	21	1	47	1	34	1	0	0	182	3	5	0	269	9
18:45:00	780	0	5038	0	1016	0	21	0	47	0	34	0	0	0	182	0	5	0	269	0
18:45:15	780	0	5038	0	1016	0	21	0	47	0	34	0	0	0	182	0	5	0	269	0

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Morning Peak Diagram

Specified Period
From: 5:00:00
To: 9:00:00

One Hour Peak
From: 8:00:00
To: 9:00:00

Municipality: Toronto
Site #: 1406100007
Intersection: York Gate Blvd & South Plaza Acce
TFR File #: 1
Count date: 13-May-14

Weather conditions:

Person(s) who counted:

**** Non-Signalized Intersection ****

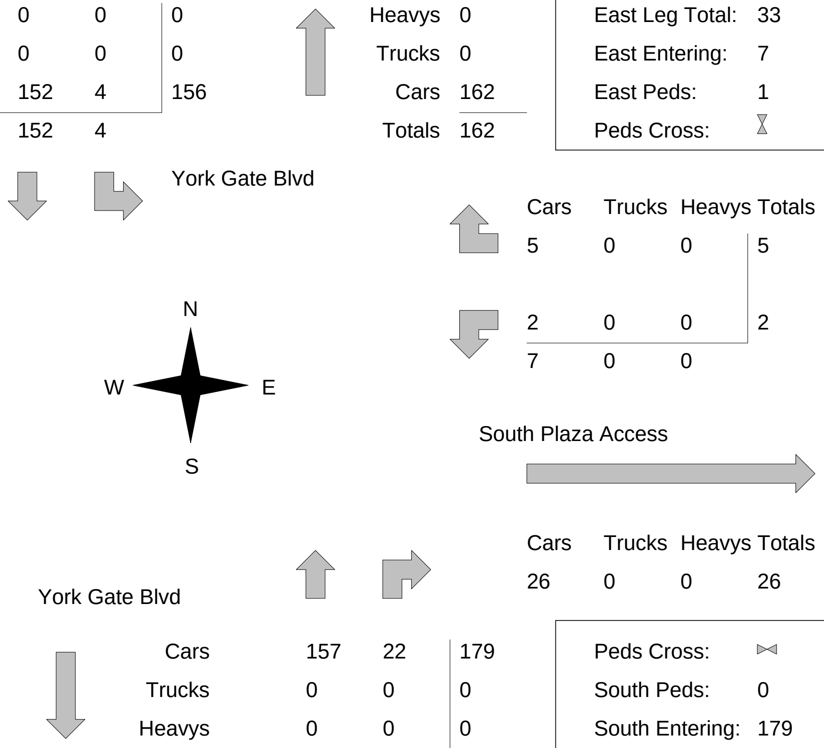
Major Road: York Gate Blvd runs N/S

North Leg Total: 318
North Entering: 156
North Peds: 0
Peds Cross: ⋈

Heavys	0	0	0
Trucks	0	0	0
Cars	152	4	156
Totals	152	4	

Heavys	0
Trucks	0
Cars	162
Totals	162

East Leg Total: 33
East Entering: 7
East Peds: 1
Peds Cross: ⧗



Cars	Trucks	Heavys	Totals
5	0	0	5
2	0	0	2
7	0	0	

Cars	Trucks	Heavys	Totals
26	0	0	26

Cars	154
Trucks	0
Heavys	0
Totals	154

Cars	157	22	179
Trucks	0	0	0
Heavys	0	0	0
Totals	157	22	

Peds Cross: ⋈
South Peds: 0
South Entering: 179
South Leg Total: 333

Comments

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Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period		**One Hour Peak**	
From:	16:00:00	**From:**	16:45:00
To:	18:30:00	**To:**	17:45:00

Municipality: Toronto
Site #: 1406100007
Intersection: York Gate Blvd & South Plaza Acce
TFR File #: 1
Count date: 13-May-14

Weather conditions:

Person(s) who counted:

**** Non-Signalized Intersection ****

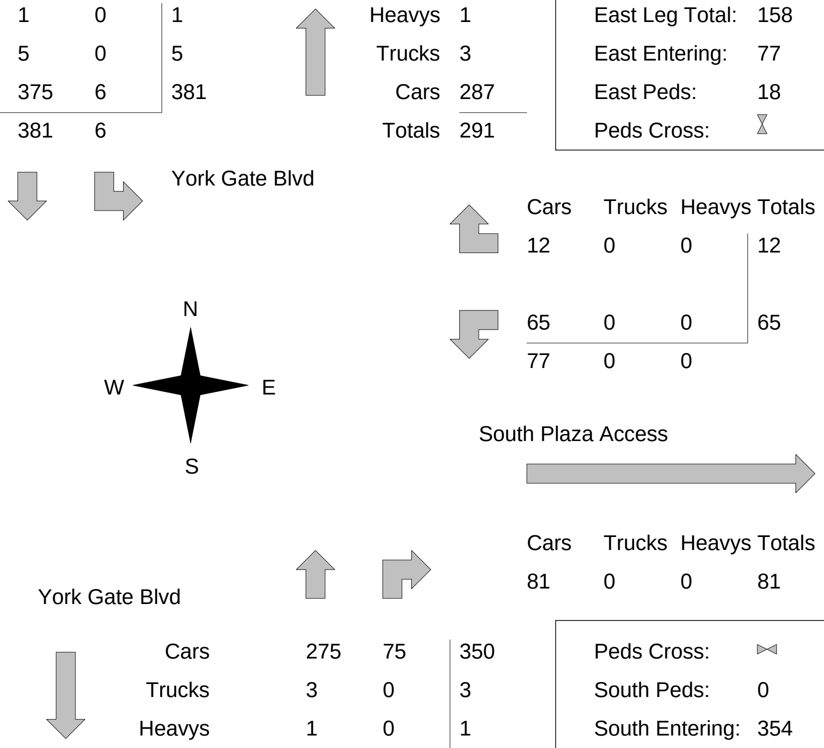
Major Road: York Gate Blvd runs N/S

North Leg Total: 678
North Entering: 387
North Peds: 2
Peds Cross: ⋈

Heavys	1	0	1
Trucks	5	0	5
Cars	375	6	381
Totals	381	6	

Heavys	1
Trucks	3
Cars	287
Totals	291

East Leg Total: 158
East Entering: 77
East Peds: 18
Peds Cross: ⧗



Cars	Trucks	Heavys	Totals
12	0	0	12
65	0	0	65
77	0	0	

Cars	Trucks	Heavys	Totals
81	0	0	81

Cars	440
Trucks	5
Heavys	1
Totals	446

Cars	275	75	350
Trucks	3	0	3
Heavys	1	0	1
Totals	279	75	

Peds Cross: ⋈
South Peds: 0
South Entering: 354
South Leg Total: 800

Comments

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Accu-Traffic Inc.

Total Count Diagram

Municipality: Toronto
Site #: 1406100007
Intersection: York Gate Blvd & South Plaza Acce
TFR File #: 1
Count date: 13-May-14

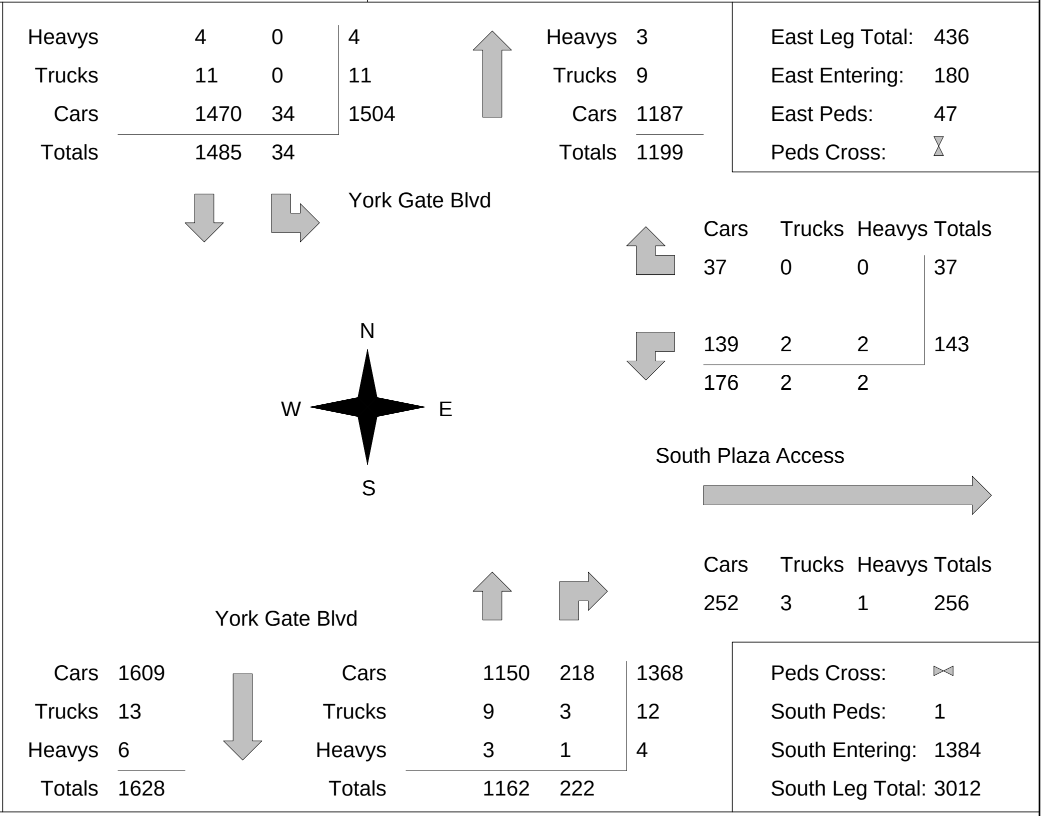
Weather conditions:

Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: York Gate Blvd runs N/S

North Leg Total:	2718
North Entering:	1519
North Peds:	4
Peds Cross:	⋈



Heavys	4	0	4
Trucks	11	0	11
Cars	1470	34	1504
Totals	1485	34	

Heavys	3
Trucks	9
Cars	1187
Totals	1199

East Leg Total:	436
East Entering:	180
East Peds:	47
Peds Cross:	⧗

Cars	Trucks	Heavys	Totals
37	0	0	37
139	2	2	143
176	2	2	

Cars	Trucks	Heavys	Totals
252	3	1	256

Cars	1609
Trucks	13
Heavys	6
Totals	1628

Cars	1150	218	1368
Trucks	9	3	12
Heavys	3	1	4
Totals	1162	222	

Peds Cross:	⋈
South Peds:	1
South Entering:	1384
South Leg Total:	3012

Comments

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Accu-Traffic Inc.
Traffic Count Summary

Intersection York Gate Blvd & South Plaza Acc | **Count Date** 13-May-14 | **Municipality** Toronto

North Approach Totals							South Approach Totals					
	Includes Cars, Trucks, & Heavys					North/South Total Approaches		Includes Cars, Trucks, & Heavys				
Hour Ending	Left	Thru	Right	Grand Total	Total Peds		Hour Ending	Left	Thru	Right	Grand Total	Total Peds
5:00:00	0	0	0	0	0	0	5:00:00	0	0	0	0	0
6:00:00	0	64	0	64	0	93	6:00:00	0	27	2	29	0
7:00:00	1	201	0	202	0	292	7:00:00	0	84	6	90	1
8:00:00	4	191	0	195	0	326	8:00:00	0	117	14	131	0
9:00:00	7	228	0	235	0	496	9:00:00	0	231	30	261	0
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	6	325	0	331	2	682	17:00:00	0	283	68	351	0
18:00:00	10	354	0	364	2	706	18:00:00	0	279	63	342	0
Totals:	28	1363	0	1391	4	2595		0	1021	183	1204	1

East Approach Totals							West Approach Totals					
	Includes Cars, Trucks, & Heavys					East/West Total Approaches		Includes Cars, Trucks, & Heavys				
Hour Ending	Left	Thru	Right	Grand Total	Total Peds		Hour Ending	Left	Thru	Right	Grand Total	Total Peds
5:00:00	0	0	0	0	0	0	5:00:00	0	0	0	0	0
6:00:00	1	0	1	2	0	2	6:00:00	0	0	0	0	0
7:00:00	3	0	0	3	3	3	7:00:00	0	0	0	0	0
8:00:00	3	0	1	4	4	4	8:00:00	0	0	0	0	0
9:00:00	5	0	7	12	1	12	9:00:00	0	0	0	0	0
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	36	0	8	44	9	44	17:00:00	0	0	0	0	0
18:00:00	78	0	17	95	19	95	18:00:00	0	0	0	0	0
Totals:	126	0	34	160	36	160		0	0	0	0	0

Calculated Values for Traffic Crossing Major Street

Hours Ending:	5:00	6:00	7:00	8:00	9:00	16:00	17:00	18:00
Crossing Values:	0	1	4	3	5	0	38	80

Accu-Traffic Inc.

Count Date: 13-May-14 **Site #: 1406100007**

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30:00	0	0	23	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45:00	0	0	38	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00:00	0	0	64	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	0	0	102	38	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
6:30:00	0	0	138	36	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
6:45:00	0	0	202	64	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
7:00:00	1	1	264	62	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
7:15:00	2	1	308	44	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0
7:30:00	4	2	346	38	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
7:45:00	5	1	394	48	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
8:00:00	5	0	454	60	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
8:15:00	5	0	486	32	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
8:30:00	6	1	547	61	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
8:45:00	9	3	606	59	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
9:00:00	12	3	682	76	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
16:00:00	12	0	682	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
16:15:00	13	1	742	60	0	0	0	0	4	3	0	0	0	0	1	0	0	0	0	0
16:30:00	13	0	815	73	0	0	0	0	4	0	0	0	0	0	1	0	0	0	0	0
16:45:00	17	4	914	99	0	0	0	0	4	0	0	0	0	0	1	0	0	0	2	2
17:00:00	18	1	1003	89	0	0	0	0	5	1	0	0	0	0	1	0	0	0	2	0
17:15:00	21	3	1094	91	0	0	0	0	5	0	0	0	0	0	1	0	0	0	2	0
17:30:00	23	2	1200	106	0	0	0	0	9	4	0	0	0	0	2	1	0	0	2	0
17:45:00	23	0	1289	89	0	0	0	0	9	0	0	0	0	0	2	0	0	0	4	2
18:00:00	28	5	1352	63	0	0	0	0	9	0	0	0	0	0	2	0	0	0	4	0
18:15:00	29	1	1406	54	0	0	0	0	10	1	0	0	0	0	2	0	0	0	4	0
18:30:00	34	5	1470	64	0	0	0	0	11	1	0	0	0	0	4	2	0	0	4	0
18:45:00	34	0	1470	0	0	0	0	0	11	0	0	0	0	0	4	0	0	0	4	0
18:45:15	34	0	1470	0	0	0	0	0	11	0	0	0	0	0	4	0	0	0	4	0

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Count Date: 13-May-14 Site #: 1406100007

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45:00	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00:00	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
6:30:00	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
6:45:00	3	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1
7:00:00	4	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1
7:15:00	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5	2
7:30:00	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	7	2
7:45:00	4	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	7	0
8:00:00	5	1	0	0	2	0	0	0	0	0	0	0	2	2	0	0	0	0	7	0
8:15:00	5	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0	0	0	7	0
8:30:00	5	0	0	0	6	4	0	0	0	0	0	0	2	0	0	0	0	0	7	0
8:45:00	7	2	0	0	7	1	0	0	0	0	0	0	2	0	0	0	0	0	8	1
9:00:00	10	3	0	0	9	2	0	0	0	0	0	0	2	0	0	0	0	0	8	0
16:00:00	10	0	0	0	9	0	0	0	0	0	0	0	2	0	0	0	0	0	8	0
16:15:00	19	9	0	0	10	1	0	0	0	0	0	0	2	0	0	0	0	0	12	4
16:30:00	27	8	0	0	15	5	0	0	0	0	0	0	2	0	0	0	0	0	12	0
16:45:00	36	9	0	0	17	2	1	1	0	0	0	0	2	0	0	0	0	0	15	3
17:00:00	45	9	0	0	17	0	1	0	0	0	0	0	2	0	0	0	0	0	17	2
17:15:00	65	20	0	0	19	2	1	0	0	0	0	0	2	0	0	0	0	0	26	9
17:30:00	76	11	0	0	26	7	1	0	0	0	0	0	2	0	0	0	0	0	26	0
17:45:00	101	25	0	0	29	3	1	0	0	0	0	0	2	0	0	0	0	0	33	7
18:00:00	123	22	0	0	34	5	1	0	0	0	0	0	2	0	0	0	0	0	36	3
18:15:00	133	10	0	0	37	3	1	0	0	0	0	0	2	0	0	0	0	0	37	1
18:30:00	139	6	0	0	37	0	2	1	0	0	0	0	2	0	0	0	0	0	47	10
18:45:00	139	0	0	0	37	0	2	0	0	0	0	0	2	0	0	0	0	0	47	0
18:45:15	139	0	0	0	37	0	2	0	0	0	0	0	2	0	0	0	0	0	47	0

Accu-Traffic Inc.

Count Date: 13-May-14 Site #: 1406100007

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30:00	0	0	7	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45:00	0	0	18	11	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00:00	0	0	26	8	2	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
6:15:00	0	0	38	12	4	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0
6:30:00	0	0	53	15	5	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
6:45:00	0	0	76	23	8	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0
7:00:00	0	0	110	34	8	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
7:15:00	0	0	140	30	8	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
7:30:00	0	0	169	29	11	3	0	0	0	0	0	0	0	0	1	0	0	0	1	0
7:45:00	0	0	191	22	14	3	0	0	0	0	0	0	0	0	1	0	1	1	1	0
8:00:00	0	0	227	36	20	6	0	0	0	0	1	1	0	0	1	0	1	0	1	0
8:15:00	0	0	278	51	26	6	0	0	0	0	1	0	0	0	1	0	1	0	1	0
8:30:00	0	0	339	61	32	6	0	0	0	0	1	0	0	0	1	0	1	0	1	0
8:45:00	0	0	384	45	42	10	0	0	0	0	1	0	0	0	1	0	1	0	1	0
9:00:00	0	0	457	73	50	8	0	0	1	1	1	0	0	0	1	0	1	0	1	0
16:00:00	0	0	457	0	50	0	0	0	1	0	1	0	0	0	1	0	1	0	1	0
16:15:00	0	0	524	67	67	17	0	0	1	0	1	0	0	0	1	0	1	0	1	0
16:30:00	0	0	594	70	79	12	0	0	2	1	2	1	0	0	1	0	1	0	1	0
16:45:00	0	0	653	59	97	18	0	0	4	2	2	0	0	0	2	1	1	0	1	0
17:00:00	0	0	736	83	117	20	0	0	4	0	2	0	0	0	2	0	1	0	1	0
17:15:00	0	0	798	62	134	17	0	0	4	0	2	0	0	0	3	1	1	0	1	0
17:30:00	0	0	869	71	152	18	0	0	4	0	2	0	0	0	3	0	1	0	1	0
17:45:00	0	0	928	59	172	20	0	0	7	3	2	0	0	0	3	0	1	0	1	0
18:00:00	0	0	1011	83	180	8	0	0	7	0	2	0	0	0	3	0	1	0	1	0
18:15:00	0	0	1094	83	193	13	0	0	8	1	3	1	0	0	3	0	1	0	1	0
18:30:00	0	0	1150	56	218	25	0	0	9	1	3	0	0	0	3	0	1	0	1	0
18:45:00	0	0	1150	0	218	0	0	0	9	0	3	0	0	0	3	0	1	0	1	0
18:45:15	0	0	1150	0	218	0	0	0	9	0	3	0	0	0	3	0	1	0	1	0

Accu-Traffic Inc.

Count Date: 13-May-14 Site #: 1406100007

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2
18:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
18:45:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0

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Morning Peak Diagram

Specified Period
From: 5:00:00
To: 9:00:00

One Hour Peak
From: 8:00:00
To: 9:00:00

Municipality: Toronto
Site #: 1406100008
Intersection: York Gate Blvd & North Plaza Acce
TFR File #: 1
Count date: 13-May-14

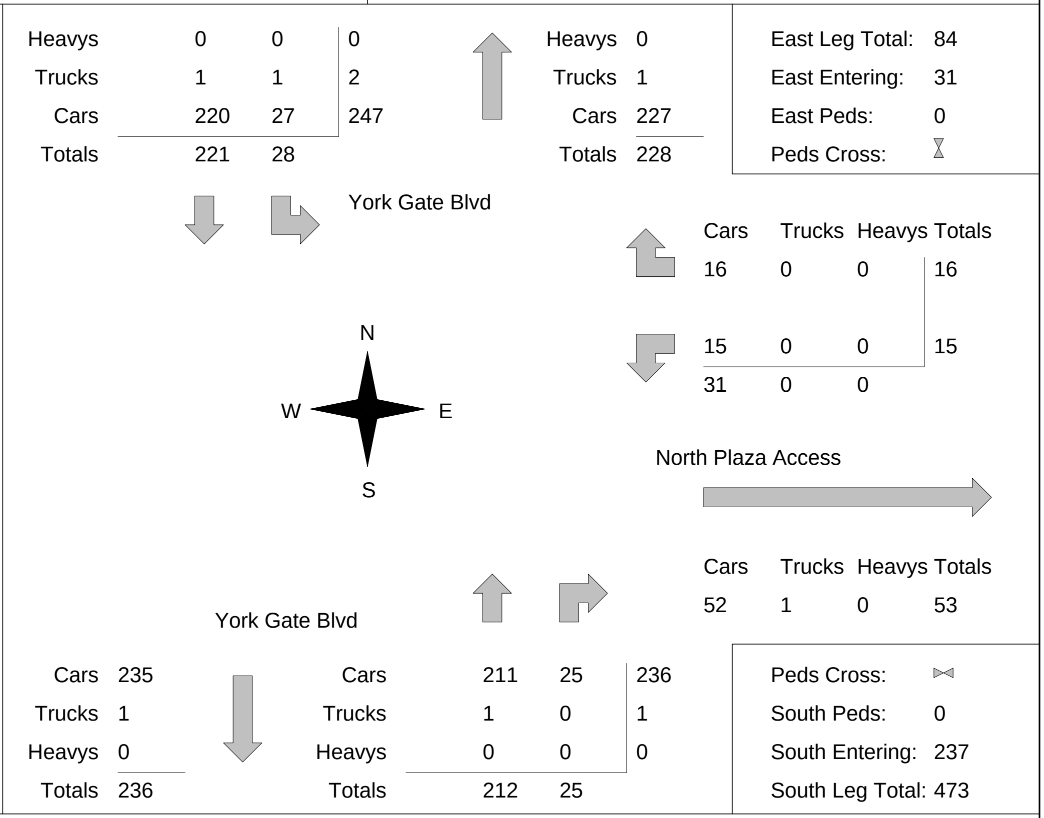
Weather conditions:

Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: York Gate Blvd runs N/S

North Leg Total: 477
North Entering: 249
North Peds: 0
Peds Cross: ⋈



Heavys	0	0	0
Trucks	1	1	2
Cars	220	27	247
Totals	221	28	

Heavys	0
Trucks	1
Cars	227
Totals	228

East Leg Total: 84
East Entering: 31
East Peds: 0
Peds Cross: ⧗

Cars	Trucks	Heavys	Totals
16	0	0	16
15	0	0	15
31	0	0	

Cars	Trucks	Heavys	Totals
52	1	0	53

Cars	235
Trucks	1
Heavys	0
Totals	236

Cars	211	25	236
Trucks	1	0	1
Heavys	0	0	0
Totals	212	25	

Peds Cross: ⋈
South Peds: 0
South Entering: 237
South Leg Total: 473

Comments

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Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period
From: 16:00:00
To: 18:30:00

One Hour Peak
From: 16:30:00
To: 17:30:00

Municipality: Toronto
Site #: 1406100008
Intersection: York Gate Blvd & North Plaza Acce
TFR File #: 1
Count date: 13-May-14

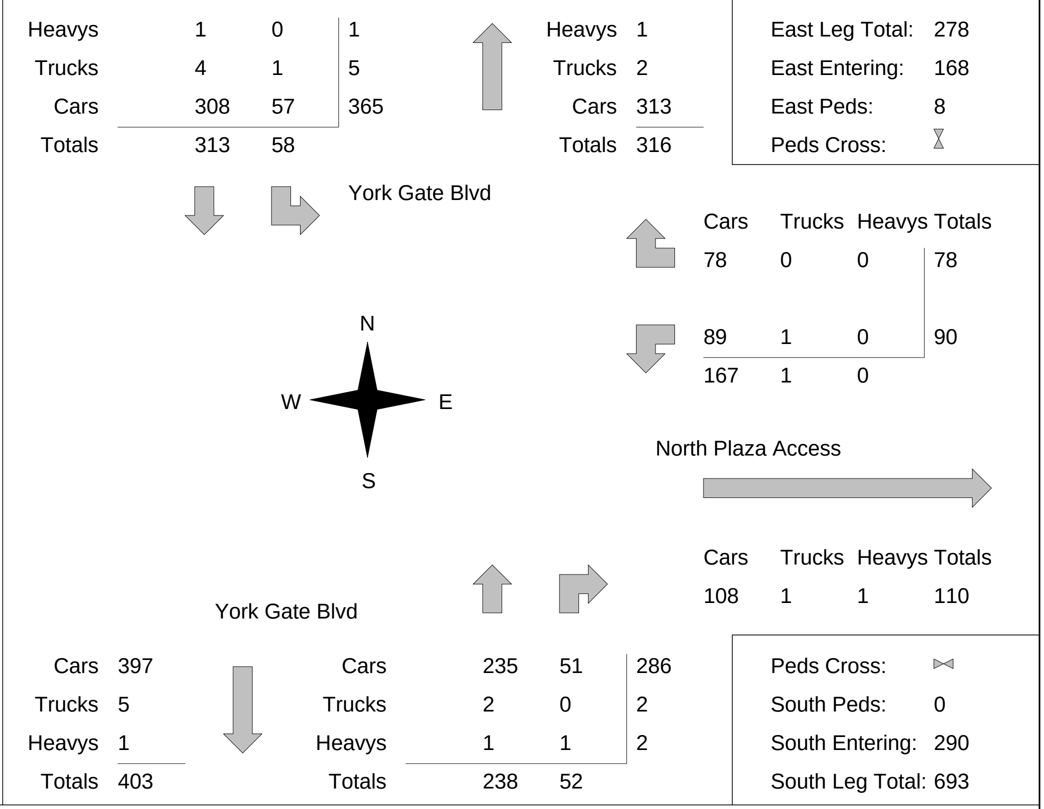
Weather conditions:

Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: York Gate Blvd runs N/S

North Leg Total: 687
North Entering: 371
North Peds: 0
Peds Cross: ⋈



Heavys	1	0	1
Trucks	4	1	5
Cars	308	57	365
Totals	313	58	

Heavys	1
Trucks	2
Cars	313
Totals	316

East Leg Total: 278
East Entering: 168
East Peds: 8
Peds Cross: ⧗

Cars	Trucks	Heavys	Totals
78	0	0	78
89	1	0	90
167	1	0	

Cars	Trucks	Heavys	Totals
108	1	1	110

Cars	397
Trucks	5
Heavys	1
Totals	403

Cars	235	51	286
Trucks	2	0	2
Heavys	1	1	2
Totals	238	52	

Peds Cross: ⋈
South Peds: 0
South Entering: 290
South Leg Total: 693

Comments

Accu-Traffic Inc.

Total Count Diagram

Municipality: Toronto
Site #: 1406100008
Intersection: York Gate Blvd & North Plaza Acce
TFR File #: 1
Count date: 13-May-14

Weather conditions:

Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: York Gate Blvd runs N/S

North Leg Total:	2712
North Entering:	1473
North Peds:	0
Peds Cross:	⋈

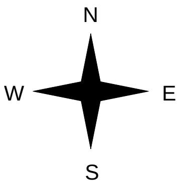
Heavys	5	0	5
Trucks	7	2	9
Cars	1283	176	1459
Totals	1295	178	

Heavys	4
Trucks	8
Cars	1227
Totals	1239

East Leg Total:	783
East Entering:	435
East Peds:	29
Peds Cross:	⧗

York Gate Blvd

Cars	Trucks	Heavys	Totals
207	0	1	208
224	3	0	227
431	3	1	



North Plaza Access

Cars	Trucks	Heavys	Totals
345	2	1	348

York Gate Blvd

Cars	1507
Trucks	10
Heavys	5
Totals	1522

Cars	1020	169	1189
Trucks	8	0	8
Heavys	3	1	4
Totals	1031	170	

Peds Cross:	⋈
South Peds:	0
South Entering:	1201
South Leg Total:	2723

Comments

Accu-Traffic Inc.
Traffic Count Summary

Intersection York Gate Blvd & North Plaza Acce **Count Date** 13-May-14 **Municipality** Toronto

North Approach Totals							South Approach Totals					
	Includes Cars, Trucks, & Heavys							Includes Cars, Trucks, & Heavys				
Hour Ending	Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches	Hour Ending	Left	Thru	Right	Grand Total	Total Peds
5:00:00	0	0	0	0	0	0	5:00:00	0	0	0	0	0
6:00:00	2	64	0	66	0	95	6:00:00	0	28	1	29	0
7:00:00	7	200	0	207	0	291	7:00:00	0	81	3	84	0
8:00:00	10	190	0	200	0	319	8:00:00	0	114	5	119	0
9:00:00	28	221	0	249	0	486	9:00:00	0	212	25	237	0
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	51	258	0	309	0	600	17:00:00	0	227	64	291	0
18:00:00	46	267	0	313	0	610	18:00:00	0	252	45	297	0
Totals:	144	1200	0	1344	0	2401		0	914	143	1057	0

East Approach Totals							West Approach Totals					
	Includes Cars, Trucks, & Heavys							Includes Cars, Trucks, & Heavys				
Hour Ending	Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches	Hour Ending	Left	Thru	Right	Grand Total	Total Peds
5:00:00	0	0	0	0	0	0	5:00:00	0	0	0	0	0
6:00:00	0	0	1	1	0	1	6:00:00	0	0	0	0	0
7:00:00	2	0	2	4	0	4	7:00:00	0	0	0	0	0
8:00:00	3	0	1	4	2	4	8:00:00	0	0	0	0	0
9:00:00	15	0	16	31	0	31	9:00:00	0	0	0	0	0
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	75	0	69	144	8	144	17:00:00	0	0	0	0	0
18:00:00	99	0	84	183	14	183	18:00:00	0	0	0	0	0
Totals:	194	0	173	367	24	367		0	0	0	0	0

Calculated Values for Traffic Crossing Major Street

Hours Ending:	5:00	6:00	7:00	8:00	9:00	16:00	17:00	18:00
Crossing Values:	0	0	2	3	15	0	75	99

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Accu-Traffic Inc.

Count Date: 13-May-14 Site #: 1406100008

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30:00	1	1	23	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45:00	1	0	38	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00:00	2	1	64	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	2	0	103	39	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
6:30:00	3	1	139	36	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
6:45:00	5	2	202	63	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
7:00:00	9	4	263	61	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
7:15:00	11	2	304	41	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
7:30:00	14	3	344	40	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
7:45:00	16	2	392	48	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
8:00:00	19	3	453	61	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
8:15:00	24	5	484	31	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0
8:30:00	28	4	540	56	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
8:45:00	32	4	599	59	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
9:00:00	46	14	673	74	0	0	1	1	1	0	0	0	0	0	1	0	0	0	0	0
9:15:00	46	0	673	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0
16:00:00	46	0	673	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0
16:15:00	57	11	716	43	0	0	1	0	2	1	0	0	0	0	1	0	0	0	0	0
16:30:00	70	13	772	56	0	0	1	0	2	0	0	0	0	0	1	0	0	0	0	0
16:45:00	85	15	855	83	0	0	2	1	2	0	0	0	0	0	1	0	0	0	0	0
17:00:00	96	11	930	75	0	0	2	0	2	0	0	0	0	0	1	0	0	0	0	0
17:15:00	108	12	995	65	0	0	2	0	2	0	0	0	0	0	1	0	0	0	0	0
17:30:00	127	19	1080	85	0	0	2	0	6	4	0	0	0	0	2	1	0	0	0	0
17:45:00	133	6	1142	62	0	0	2	0	6	0	0	0	0	0	2	0	0	0	0	0
18:00:00	142	9	1192	50	0	0	2	0	6	0	0	0	0	0	2	0	0	0	0	0
18:15:00	157	15	1231	39	0	0	2	0	6	0	0	0	0	0	3	1	0	0	0	0
18:30:00	176	19	1283	52	0	0	2	0	7	1	0	0	0	0	5	2	0	0	0	0
18:45:00	176	0	1283	0	0	0	2	0	7	0	0	0	0	0	5	0	0	0	0	0
18:45:15	176	0	1283	0	0	0	2	0	7	0	0	0	0	0	5	0	0	0	0	0

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Count Date: 13-May-14 **Site #: 1406100008**

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30:00	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30:00	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45:00	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00:00	2	1	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	5	3	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	5	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
7:45:00	5	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
8:00:00	5	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1
8:15:00	6	1	0	0	9	5	0	0	0	0	0	0	0	0	0	0	0	0	2	0
8:30:00	12	6	0	0	13	4	0	0	0	0	0	0	0	0	0	0	0	0	2	0
8:45:00	15	3	0	0	17	4	0	0	0	0	0	0	0	0	0	0	0	0	2	0
9:00:00	20	5	0	0	20	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0
9:15:00	20	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
16:00:00	20	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
16:15:00	39	19	0	0	36	16	2	2	0	0	0	0	0	0	0	0	0	0	5	3
16:30:00	56	17	0	0	53	17	2	0	0	0	0	0	0	0	0	0	0	0	8	3
16:45:00	77	21	0	0	71	18	2	0	0	0	0	0	0	0	0	0	0	0	10	2
17:00:00	92	15	0	0	89	18	3	1	0	0	0	0	0	0	0	0	0	0	10	0
17:15:00	121	29	0	0	111	22	3	0	0	0	0	0	0	0	0	0	0	0	16	6
17:30:00	145	24	0	0	131	20	3	0	0	0	0	0	0	0	0	0	0	0	16	0
17:45:00	172	27	0	0	154	23	3	0	0	0	0	0	0	0	0	0	1	1	21	5
18:00:00	191	19	0	0	172	18	3	0	0	0	0	0	0	0	0	0	1	0	24	3
18:15:00	207	16	0	0	191	19	3	0	0	0	0	0	0	0	0	0	1	0	26	2
18:30:00	224	17	0	0	207	16	3	0	0	0	0	0	0	0	0	0	1	0	29	3
18:45:00	224	0	0	0	207	0	3	0	0	0	0	0	0	0	0	0	1	0	29	0
18:45:15	224	0	0	0	207	0	3	0	0	0	0	0	0	0	0	0	1	0	29	0

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Accu-Traffic Inc.

Count Date: 13-May-14 Site #: 1406100008

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30:00	0	0	7	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45:00	0	0	19	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00:00	0	0	27	8	1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0
6:15:00	0	0	38	11	2	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
6:30:00	0	0	52	14	3	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
6:45:00	0	0	75	23	3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
7:00:00	0	0	108	33	4	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
7:15:00	0	0	137	29	5	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
7:30:00	0	0	164	27	7	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0
7:45:00	0	0	188	24	7	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
8:00:00	0	0	222	34	9	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0
8:15:00	0	0	268	46	13	4	0	0	0	0	0	0	0	0	1	0	0	0	0	0
8:30:00	0	0	329	61	17	4	0	0	0	0	0	0	0	0	1	0	0	0	0	0
8:45:00	0	0	370	41	22	5	0	0	0	0	0	0	0	0	1	0	0	0	0	0
9:00:00	0	0	433	63	34	12	0	0	1	1	0	0	0	0	1	0	0	0	0	0
9:15:00	0	0	433	0	34	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
16:00:00	0	0	433	0	34	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
16:15:00	0	0	484	51	51	17	0	0	1	0	0	0	0	0	1	0	0	0	0	0
16:30:00	0	0	538	54	72	21	0	0	2	1	0	0	0	0	1	0	0	0	0	0
16:45:00	0	0	588	50	83	11	0	0	4	2	0	0	0	0	2	1	0	0	0	0
17:00:00	0	0	656	68	98	15	0	0	4	0	0	0	0	0	2	0	0	0	0	0
17:15:00	0	0	709	53	109	11	0	0	4	0	0	0	0	0	2	0	1	1	0	0
17:30:00	0	0	773	64	123	14	0	0	4	0	0	0	0	0	2	0	1	0	0	0
17:45:00	0	0	826	53	132	9	0	0	7	3	0	0	0	0	2	0	1	0	0	0
18:00:00	0	0	905	79	142	10	0	0	7	0	0	0	0	0	2	0	1	0	0	0
18:15:00	0	0	974	69	159	17	0	0	7	0	0	0	0	0	3	1	1	0	0	0
18:30:00	0	0	1020	46	169	10	0	0	8	1	0	0	0	0	3	0	1	0	0	0
18:45:00	0	0	1020	0	169	0	0	0	8	0	0	0	0	0	3	0	1	0	0	0
18:45:15	0	0	1020	0	169	0	0	0	8	0	0	0	0	0	3	0	1	0	0	0

Accu-Traffic Inc.

Count Date: 13-May-14 Site #: 1406100008

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:45:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Morning Peak Diagram

Specified Period
From: 5:00:00
To: 9:00:00

One Hour Peak
From: 8:00:00
To: 9:00:00

Municipality: Toronto
Site #: 1406100009
Intersection: Norfinch Dr & Medical Centre Acces
TFR File #: 1
Count date: 13-May-14

Weather conditions:

Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: Norfinch Dr runs N/S

North Leg Total: 626
North Entering: 373
North Peds: 0
Peds Cross: ⋈

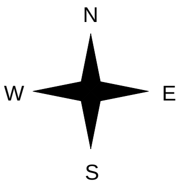
Heavys	0	10	10
Trucks	0	13	13
Cars	19	331	350
Totals	19	354	

Heavys	5
Trucks	8
Cars	240
Totals	253

Norfinch Dr

Heavys	Trucks	Cars	Totals
0	1	88	89

Medical Centre Access



Heavys	Trucks	Cars	Totals
0	0	1	1
0	1	13	14
0	1	14	

Norfinch Dr

Peds Cross: ⧗
West Peds: 8
West Entering: 15
West Leg Total: 104

Cars	344
Trucks	14
Heavys	10
Totals	368

Cars	69	239	308
Trucks	1	8	9
Heavys	0	5	5
Totals	70	252	

Peds Cross: ⋈
South Peds: 0
South Entering: 322
South Leg Total: 690

Comments

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Accu-Traffic Inc.

Afternoon Peak Diagram

Specified Period		One Hour Peak	
From:	16:00:00	**From:**	16:30:00
To:	18:30:00	**To:**	17:30:00

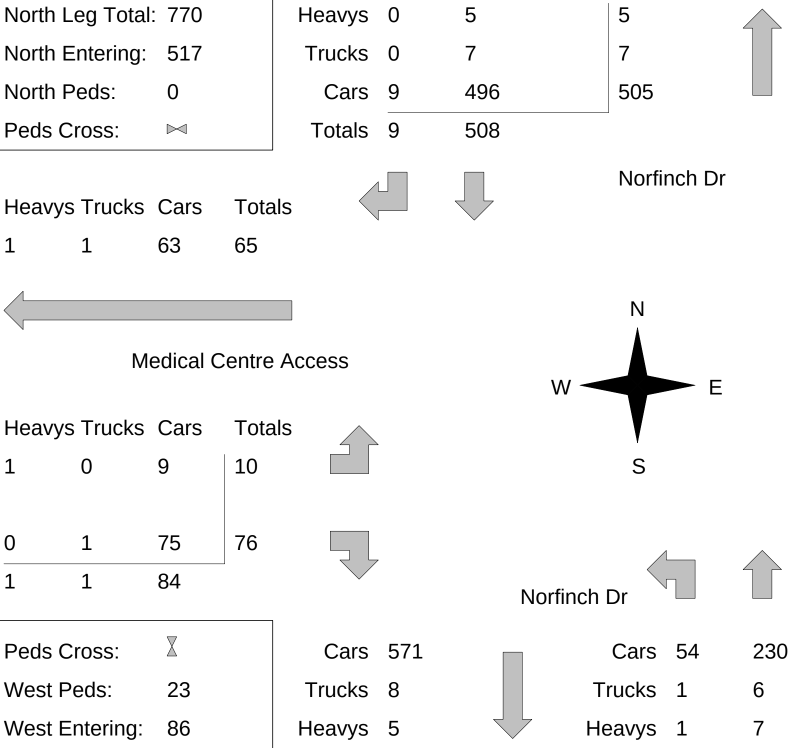
Municipality: Toronto
Site #: 1406100009
Intersection: Norfinch Dr & Medical Centre Acces
TFR File #: 1
Count date: 13-May-14

Weather conditions:

Person(s) who counted:

**** Non-Signalized Intersection ****

Major Road: Norfinch Dr runs N/S



North Leg Total: 770
North Entering: 517
North Peds: 0
Peds Cross: ⋈

Heavys	0	5	5
Trucks	0	7	7
Cars	9	496	505
Totals	9	508	

Heavys	8
Trucks	6
Cars	239
Totals	253

Heavys	Trucks	Cars	Totals
1	1	63	65

Medical Centre Access

Heavys	Trucks	Cars	Totals
1	0	9	10
0	1	75	76
1	1	84	

Peds Cross: ⧗
West Peds: 23
West Entering: 86
West Leg Total: 151

Cars	571
Trucks	8
Heavys	5
Totals	584

Cars	54	230	284
Trucks	1	6	7
Heavys	1	7	8
Totals	56	243	

Peds Cross: ⋈
South Peds: 0
South Entering: 299
South Leg Total: 883

Comments

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Accu-Traffic Inc.

Total Count Diagram

Municipality: Toronto
Site #: 1406100009
Intersection: Norfinch Dr & Medical Centre Acces
TFR File #: 1
Count date: 13-May-14

Weather conditions:

Person(s) who counted:

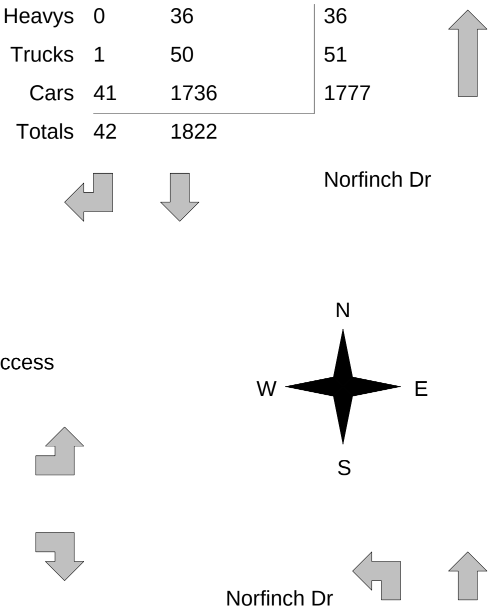
**** Non-Signalized Intersection ****

Major Road: Norfinch Dr runs N/S

North Leg Total:	3275
North Entering:	1864
North Peds:	0
Peds Cross:	⋈

Heavys	0	36	36
Trucks	1	50	51
Cars	41	1736	1777
Totals	42	1822	

Heavys	25
Trucks	30
Cars	1356
Totals	1411



Heavys	Trucks	Cars	Totals
1	5	246	252

Heavys	Trucks	Cars	Totals
1	0	28	29
0	4	184	188
1	4	212	

Peds Cross:	⧗
West Peds:	79
West Entering:	217
West Leg Total:	469

Cars	1920
Trucks	54
Heavys	36
Totals	2010

Cars	205	1328	1533
Trucks	4	30	34
Heavys	1	24	25
Totals	210	1382	

Peds Cross:	⋈
South Peds:	1
South Entering:	1592
South Leg Total:	3602

Comments

Accu-Traffic Inc.
Traffic Count Summary

Intersection	Count Date	Municipality
Norfinch Dr & Medical Centre Acce	13-May-14	Toronto

North Approach Totals							South Approach Totals					
	Includes Cars, Trucks, & Heavys							Includes Cars, Trucks, & Heavys				
Hour Ending	Left	Thru	Right	Grand Total	Total Peds	North/South Total Approaches	Hour Ending	Left	Thru	Right	Grand Total	Total Peds
5:00:00	0	0	0	0	0	0	5:00:00	0	0	0	0	0
6:00:00	0	32	0	32	0	108	6:00:00	0	76	0	76	0
7:00:00	0	146	5	151	0	416	7:00:00	7	258	0	265	0
8:00:00	0	258	1	259	0	528	8:00:00	9	260	0	269	0
9:00:00	0	354	19	373	0	695	9:00:00	70	252	0	322	0
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	0
17:00:00	0	468	8	476	0	769	17:00:00	62	231	0	293	1
18:00:00	0	421	7	428	0	707	18:00:00	48	231	0	279	0
Totals:	0	1679	40	1719	0	3223		196	1308	0	1504	1

East Approach Totals							West Approach Totals					
	Includes Cars, Trucks, & Heavys							Includes Cars, Trucks, & Heavys				
Hour Ending	Left	Thru	Right	Grand Total	Total Peds	East/West Total Approaches	Hour Ending	Left	Thru	Right	Grand Total	Total Peds
5:00:00	0	0	0	0	0	0	5:00:00	0	0	0	0	0
6:00:00	0	0	0	0	5	0	6:00:00	0	0	0	0	2
7:00:00	0	0	0	0	4	5	7:00:00	1	0	4	5	6
8:00:00	0	0	0	0	15	4	8:00:00	1	0	3	4	8
9:00:00	0	0	0	0	37	15	9:00:00	1	0	14	15	8
16:00:00	0	0	0	0	0	0	16:00:00	0	0	0	0	1
17:00:00	0	0	0	0	5	72	17:00:00	7	0	65	72	18
18:00:00	0	0	0	0	6	79	18:00:00	14	0	65	79	22
Totals:	0	0	0	0	72	175		24	0	151	175	65

Calculated Values for Traffic Crossing Major Street

Hours Ending:	5:00	6:00	7:00	8:00	9:00	16:00	17:00	18:00
Crossing Values:	0	0	1	1	1	0	8	14

Accu-Traffic Inc.

Count Date: 13-May-14 Site #: 1406100009

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30:00	0	0	12	7	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
5:45:00	0	0	20	8	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
6:00:00	0	0	30	10	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0
6:15:00	0	0	56	26	0	0	0	0	4	3	0	0	0	0	1	0	0	0	0	0
6:30:00	0	0	83	27	1	1	0	0	8	4	0	0	0	0	3	2	0	0	0	0
6:45:00	0	0	112	29	1	0	0	0	14	6	0	0	0	0	6	3	0	0	0	0
7:00:00	0	0	152	40	5	4	0	0	17	3	0	0	0	0	9	3	0	0	0	0
7:15:00	0	0	193	41	5	0	0	0	20	3	0	0	0	0	9	0	0	0	0	0
7:30:00	0	0	247	54	5	0	0	0	23	3	0	0	0	0	14	5	0	0	0	0
7:45:00	0	0	308	61	5	0	0	0	24	1	0	0	0	0	15	1	0	0	0	0
8:00:00	0	0	393	85	6	1	0	0	25	1	0	0	0	0	18	3	0	0	0	0
8:15:00	0	0	491	98	9	3	0	0	26	1	0	0	0	0	22	4	0	0	0	0
8:30:00	0	0	569	78	11	2	0	0	30	4	0	0	0	0	24	2	0	0	0	0
8:45:00	0	0	650	81	14	3	0	0	34	4	0	0	0	0	27	3	0	0	0	0
9:00:00	0	0	724	74	25	11	0	0	38	4	0	0	0	0	28	1	0	0	0	0
9:00:12	0	0	724	0	25	0	0	0	38	0	0	0	0	0	28	0	0	0	0	0
16:00:00	0	0	724	0	25	0	0	0	38	0	0	0	0	0	28	0	0	0	0	0
16:15:00	0	0	852	128	25	0	0	0	40	2	0	0	0	0	29	1	0	0	0	0
16:30:00	0	0	933	81	28	3	0	0	40	0	0	0	0	0	30	1	0	0	0	0
16:45:00	0	0	1090	157	31	3	0	0	42	2	0	0	0	0	31	1	0	0	0	0
17:00:00	0	0	1181	91	33	2	0	0	43	1	0	0	0	0	34	3	0	0	0	0
17:15:00	0	0	1315	134	36	3	0	0	46	3	0	0	0	0	34	0	0	0	0	0
17:30:00	0	0	1429	114	37	1	0	0	47	1	0	0	0	0	35	1	0	0	0	0
17:45:00	0	0	1529	100	38	1	0	0	49	2	1	1	0	0	35	0	0	0	0	0
18:00:00	0	0	1595	66	39	1	0	0	49	0	1	0	0	0	35	0	0	0	0	0
18:15:00	0	0	1680	85	39	0	0	0	50	1	1	0	0	0	36	1	0	0	0	0
18:30:00	0	0	1736	56	41	2	0	0	50	0	1	0	0	0	36	0	0	0	0	0
18:45:00	0	0	1736	0	41	0	0	0	50	0	1	0	0	0	36	0	0	0	0	0
18:45:15	0	0	1736	0	41	0	0	0	50	0	1	0	0	0	36	0	0	0	0	0

Accu-Traffic Inc.

Count Date: 13-May-14 **Site #: 1406100009**

Interval Time	Passenger Cars - East Approach						Trucks - East Approach						Heavys - East Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		East Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
5:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
6:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	4
6:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	2
6:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0
6:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	1
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	1
7:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	4
7:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	1
7:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	4
8:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	6
8:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	1
8:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	5
8:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44	14
9:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	61	17
9:00:12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	61	0
16:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	61	0
16:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	61	0
16:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62	1
16:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65	3
17:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66	1
17:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69	3
17:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70	1
17:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70	0
18:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	2
18:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72	0
18:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	2
18:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	0
18:45:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	0

Accu-Traffic Inc.

Count Date: 13-May-14 Site #: 1406100009

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	0	0	12	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30:00	0	0	32	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45:00	0	0	54	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00:00	0	0	75	21	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
6:15:00	1	1	118	43	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0
6:30:00	3	2	166	48	0	0	0	0	2	1	0	0	0	0	1	0	0	0	0	0
6:45:00	5	2	238	72	0	0	0	0	3	1	0	0	0	0	2	1	0	0	0	0
7:00:00	7	2	327	89	0	0	0	0	3	0	0	0	0	0	4	2	0	0	0	0
7:15:00	7	0	405	78	0	0	0	0	4	1	0	0	0	0	4	0	0	0	0	0
7:30:00	8	1	459	54	0	0	0	0	4	0	0	0	0	0	4	0	0	0	0	0
7:45:00	8	0	522	63	0	0	1	1	5	1	0	0	0	0	4	0	0	0	0	0
8:00:00	15	7	584	62	0	0	1	0	6	1	0	0	0	0	4	0	0	0	0	0
8:15:00	27	12	647	63	0	0	1	0	7	1	0	0	0	0	6	2	0	0	0	0
8:30:00	39	12	695	48	0	0	1	0	10	3	0	0	0	0	6	0	0	0	0	0
8:45:00	55	16	761	66	0	0	1	0	12	2	0	0	0	0	9	3	0	0	0	0
9:00:00	84	29	823	62	0	0	2	1	14	2	0	0	0	0	9	0	0	0	0	0
9:00:12	84	0	823	0	0	0	2	0	14	0	0	0	0	0	9	0	0	0	0	0
16:00:00	84	0	823	0	0	0	2	0	14	0	0	0	0	0	9	0	0	0	0	0
16:15:00	99	15	875	52	0	0	2	0	15	1	0	0	0	0	10	1	0	0	0	0
16:30:00	119	20	931	56	0	0	2	0	19	4	0	0	0	0	13	3	0	0	1	1
16:45:00	130	11	982	51	0	0	2	0	19	0	0	0	0	0	16	3	0	0	1	0
17:00:00	144	14	1039	57	0	0	3	1	21	2	0	0	1	1	17	1	0	0	1	0
17:15:00	153	9	1105	66	0	0	3	0	22	1	0	0	1	0	20	3	0	0	1	0
17:30:00	173	20	1161	56	0	0	3	0	25	3	0	0	1	0	20	0	0	0	1	0
17:45:00	180	7	1219	58	0	0	3	0	27	2	0	0	1	0	22	2	0	0	1	0
18:00:00	191	11	1257	38	0	0	4	1	28	1	0	0	1	0	23	1	0	0	1	0
18:15:00	198	7	1295	38	0	0	4	0	28	0	0	0	1	0	24	1	0	0	1	0
18:30:00	205	7	1328	33	0	0	4	0	30	2	0	0	1	0	24	0	0	0	1	0
18:45:00	205	0	1328	0	0	0	4	0	30	0	0	0	1	0	24	0	0	0	1	0
18:45:15	205	0	1328	0	0	0	4	0	30	0	0	0	1	0	24	0	0	0	1	0

Accu-Traffic Inc.

Count Date: 13-May-14 **Site #: 1406100009**

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Heavys - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
5:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
5:45:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1
6:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
6:15:00	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0
6:30:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1
6:45:00	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	5	2
7:00:00	1	1	0	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0	8	3
7:15:00	2	1	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	10	2
7:30:00	2	0	0	0	5	1	0	0	0	0	0	0	0	0	0	0	0	0	13	3
7:45:00	2	0	0	0	6	1	0	0	0	0	0	0	0	0	0	0	0	0	14	1
8:00:00	2	0	0	0	7	1	0	0	0	0	0	0	0	0	0	0	0	0	16	2
8:15:00	2	0	0	0	8	1	0	0	0	0	1	1	0	0	0	0	0	0	19	3
8:30:00	2	0	0	0	10	2	0	0	0	0	1	0	0	0	0	0	0	0	20	1
8:45:00	3	1	0	0	12	2	0	0	0	0	1	0	0	0	0	0	0	0	22	2
9:00:00	3	0	0	0	20	8	0	0	0	0	1	0	0	0	0	0	0	0	24	2
9:00:12	3	0	0	0	20	0	0	0	0	0	1	0	0	0	0	0	0	0	25	1
16:00:00	3	0	0	0	20	0	0	0	0	0	1	0	0	0	0	0	0	0	25	0
16:15:00	4	1	0	0	32	12	0	0	0	0	1	0	0	0	0	0	0	0	29	4
16:30:00	6	2	0	0	49	17	0	0	0	0	1	0	0	0	0	0	0	0	34	5
16:45:00	8	2	0	0	70	21	0	0	0	0	1	0	0	0	0	0	0	0	38	4
17:00:00	9	1	0	0	85	15	0	0	0	0	1	0	1	1	0	0	0	0	43	5
17:15:00	14	5	0	0	100	15	0	0	0	0	2	1	1	0	0	0	0	0	50	7
17:30:00	15	1	0	0	124	24	0	0	0	0	2	0	1	0	0	0	0	0	57	7
17:45:00	21	6	0	0	135	11	0	0	0	0	3	1	1	0	0	0	0	0	63	6
18:00:00	23	2	0	0	147	12	0	0	0	0	4	1	1	0	0	0	0	0	65	2
18:15:00	26	3	0	0	168	21	0	0	0	0	4	0	1	0	0	0	0	0	67	2
18:30:00	28	2	0	0	184	16	0	0	0	0	4	0	1	0	0	0	0	0	79	12
18:45:00	28	0	0	0	184	0	0	0	0	0	4	0	1	0	0	0	0	0	79	0
18:45:15	28	0	0	0	184	0	0	0	0	0	4	0	1	0	0	0	0	0	79	0

CURRENT SIGNAL TIMING INFORMATION

CITY OF TORONTO - TRANSPORTATION SERVICES
TRAFFIC MANAGEMENT CENTRE - URBAN TRAFFIC CONTROL SYSTEMS
703 Don Mills Rd, Toronto ON M3C 3N3
Phone: 416 397 5770, Fax 416 397 5777

Intersection: Finch Avenue & Jane Street
PX: 534
Preparation Date: May 29, 2014
Our Ref: 14093
Staff: WW/CL
System: MTSS
MOC: FXT
Implementation Date: February 26, 2013
Controller Type: Novax L7N2
Issued to: AECOM (Lam Chit (Francis) Li)
Design walk Speed: 1.0 m/s

PLAN	**AM PEAK**	**OFF PEAK**	**PM PEAK**
TIME PERIOD	**6:30-9:15 Mon-Fri**	**ALL Other times**	**15:00-18:30 Mon-Fri**
E-W PHASE			
**EBLA/EBG/EWWK (South Side) or WBLA/WBG/EWWK (North Side) or EWLA/EWDW or EWG/EWWK	6	6	7
**EBYA/EBG/EWWK (South Side) or WBYA/WBG/EWWK (North Side) or EWYA/EWDW or EWG/EWWK	2	2	2
EBG/EWWK or EWG/EWWK	2	2	2
EWG/EWWK	17	14	16
EWG/EWFD	21	21	21
EWY/EWDW	4	4	4
ALLR	3	3	3
N-S PHASE			
*NBLA/NBG/NSWK or SBLA/SBG/EWWK or NSLA/NSDW or NSG/NSWK	8	6	8
*NBYA/NBG/NSWK or SBYA/SBG/EWWK or NSYA/NSDW or NSG/NSWK	2	2	2
NBG/NSWK or NSG/NSWK	2	2	2
NSG/NSWK(Both Side)	13	13	13
NSG/NSFD	23	23	23
NSY/NSDW	4	4	4
ALLR	3	3	3
CYCLE LENGTH	110	105	110
OFFSETS(E-W)	80	59	101

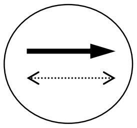
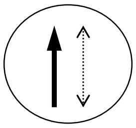
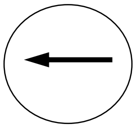
COMMENTS:
*NSLA is callable 24 hours by stopbar loops. Unused time allocated to NSG.
**EWLA is callable 24 hours by stopbar loops. Unused time allocated to EWG.
This intersection is equipped with Audiable Pedestrian Signal (APS).

CURRENT SIGNAL TIMING INFORMATION
CITY OF TORONTO - TRANSPORTATION SERVICES
TRANSPORTATION SYSTEMS - TRAFFIC SIGNAL CONTROL SECTION

703 Don Mills Rd, Toronto ON M3C 3N3
Phone: (416) 397 5770, Fax (416) 397 5777

ISSUED TO: AECOM (Lam Chit (Francis) Li) **OUR REF: 14093**
DATE: May 29, 2014 **STAFF: WW/CL**

LOCATION: **Finch Ave W & Hwy 400 NB Off-Ramp (E TCS)**
MTO Signal
DISTRICT: **North York**
N
PX: **809**
COMPUTER SYSTEM: **TransSuite**
MODE/COMMENT: **SA2-VMG with WRM (UPS)**
CONTROLLER/CABINET TYPE: **Econolite ASC/3-2100 / TS2 T1**
PREPARED/CHECKED BY: **JS / HL**
CONFLICT FLASH: **Red & Red**
PREPARATION DATE: **February 4, 2011**
DESIGN WALK SPEED: **1.0 m/s (FDW based on full crossing at 1.2 m/s)**
IMPLEMENTATION DATE: **March 14, 2011**
CHANNEL/DROP: **4084/12**

NEMA Phase			OFF All Other Times	AM 06:30-09:15 M-F	PM 15:00-18:30 M-F	Phase Mode (Fixed/Demanded/Callable)	Remarks
	Local Plan		Pattern 1	Pattern 2	Pattern 3		
	System Plan		Plan 1	Plan 2	Plan 3		
1 NOT USED	WLK						Pedestrian Minimums: EWWK = 7 secs; EWFD = 8 secs NSWK = 7 secs; NSFD = 22 secs
	FDW						
	MIN						NS phase is callable by vehicle or pedestrian actuation. If a vehicle call is received, the minimum NBG is 7 seconds. If ongoing vehicle demand exists on the stopbar loop, the NBG is capable of providing vehicle extensions up to the maximum green split. If a pedestrian call is received, the pedestrian mimimum will be served. The NSWK & NSFD are only displayed on the pedestrian signal heads if a pedestrian call is received. Extension time is based on vehicle demand. Unused extension time is given to the EWG.
	MAX1						
	AMB						
	ALR						
	SPLIT						
Finch Ave W 2 	WLK	7				Fixed EBSA	
	FDW	8					
	MIN	15					
	MAX1	15					
	AMB	4					
	ALR	2					
	SPLIT		62	63	65		
3 NOT USED	WLK						The signal constantly cycles through main street FDW to improve response time to side street vehicle and pedestrian demand. EWFD reverts to EWWK if there is no side street demand at the end of the EWFD. Side Street Passage Time = 3 secs NS pushbuttons monitored on local detector 2. NS pedestrians cross on east side only.
	FDW						
	MIN						
	MAX1						
	AMB						
	ALR						
	SPLIT						
Hwy 400 NB Off-Ramp (E TCS) 4 	WLK	7				Callable by stopbar loop and/or pushbutton; Extendable by stopbar loop.	
	FDW	22					
	MIN	7					
	MAX1	29					
	AMB	3					
	ALR	3					
	SPLIT		38	47	45		
5 NOT USED	WLK						
	FDW						
	MIN						
	MAX1						
	AMB						
	ALR						
	SPLIT						
Finch Ave W 6 	WLK	7				Fixed WBSA	
	FDW	8					
	MIN	15					
	MAX1	15					
	AMB	4					
	ALR	2					
	SPLIT		62	63	65		
7 NOT USED	WLK						
	FDW						
	MIN						
	MAX1						
	AMB						
	ALR						
	SPLIT						
8 NOT USED	WLK	7					
	FDW	22					
	MIN	7					
	MAX1	29					
	AMB	3					
	ALR	3					
	SPLIT		38	47	45		
	CL		100	110	110		
	OF		83	22	37		
	VP		8	8	8		

NOTES: T-Intersection - no north leg.
Prohibited Vehicle Movements: Westbound Left-Turn and Eastbound Right-Turn
Pedestrian Crossing is Prohibited on the West Side of the Intersection (Crossing Finch Ave W)
Picked up on TransSuite June 4, 2013 at 14:32 p.m

CURRENT SIGNAL TIMING INFORMATION

CITY OF TORONTO - TRANSPORTATION SERVICES
TRAFFIC MANAGEMENT CENTRE - URBAN TRAFFIC CONTROL SYSTEMS
703 Don Mills Rd, Toronto ON M3C 3N3
Phone: 416 397 5770, Fax 416 397 5777

Intersection: Finch Ave W. & Norfinch Dr / Oakdale Rd
PX: 870
Preparation Date: May 29, 2014
Our Ref: 14093
Staff: WW/CL
System: MTSS
MOC: SAP on Recall
Implementation Date: January 2, 2014
Controller Type: EPIC 140
Issued to: AECOM (Lam Chit (Francis) Li)
Design Walk Speed: 1.0 m/s (FDW based on full crossing @ 1.2 m/s)

PLAN	AM PEAK	OFF PEAK	PM PEAK
TIME PERIOD	06:30-09:15 Mon-Fri	All Other Times	15:00-18:30 Mon-Fri
E-W PHASE			
*EBLA/EBG/SBRA/EWWK (South S.) or WBLA/WBG/NBRA/EWWK (North S.) or EWLA/SBRA/NBRA/EWDW or EWG/EWWK	13	6	6
*EBYA/EBG/SRYA/EWWK (South S.) or WBYA/WBG/NRYA/EWWK (North S.) or EWYA/SRYA/NRYA/EWDW or EWG/EWWK	2	2	2
*EBG/EWWK (South S.) or WBG/EWWK (North S.) or ALLR/EWDW or EWG/EWWK	2	2	2
EWG/EWWK	27	14	30
EWG/EWFD	20	20	20
EWY/EWDW	4	4	4
ALLR	3	3	3
N-S PHASE			
**NBLA/NBG/NSWK (East S.) or NSG/NSWK	6	6	15
**NBYA/NBG/NSWK (East S.) or NSG/NSWK	2	2	2
**NBG/NSWK (East S.) or NSG/NSWK	2	2	2
NSG/NSWK	7	7	7
NSG/NSFD	25	25	25
NSY/NSDW	4	4	4
ALLR	3	3	3
CYCLE LENGTH	120	100	125
OFFSETS(E-W)	21	9	47

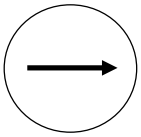
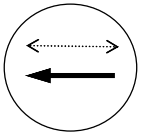
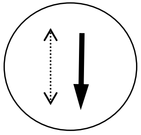
COMMENTS:
*EBLA and WBLA are callable 24 hours by setback loops. Unused time allocated to EWG.
**NBLA is callable 24 hours by setback loops. Unused time allocated to NSG.
The NSWK & NSFD are displayed on the pedestrian signal heads if a vehicle and/or pedestrian call is received
This intersection is equipped with Transit Priority providing up to a maximum extension of 16 seconds on EWG/EWDW phase

CURRENT SIGNAL TIMING INFORMATION
CITY OF TORONTO - TRANSPORTATION SERVICES
TRANSPORTATION SYSTEMS - TRAFFIC SIGNAL CONTROL SECTION
703 Don Mills Rd, Toronto ON M3C 3N3
Phone: (416) 397 5770, Fax (416) 397 5777

ISSUED TO: AECOM (Lam Chit (Francis) Li) **OUR REF: 14093**
DATE: May 29, 2014 **STAFF: WW/CL**

LOCATION:	**Finch Ave W & Hwy 400 West Ramp-MTO Signal**	*DISTRICT:*	**Etobicoke York**
MODE/COMMENT:	**SA2-VMG (UPS)**	*COMPUTER SYSTEM:*	**TransSuite**
PX:	**1095**	*CONTROLLER/CABINET TYPE:*	**Econolite ASC/3-2100/TS2T1**
PREPARED/CHECKED BY:	**HP / HL**	*CONFLICT FLASH:*	**Red & Red**
PREPARATION DATE:	**November 26, 2010**	*DESIGN WALK SPEED:*	**1.0 m/s (FDW based on full crossing at 1.2 m/s)**
IMPLEMENTATION DATE:	**March 8, 2011**	*CHANNEL/DROP:*	4084/13

N ↑

NEMA Phase			**OFF** **All Other Times**	**AM** **06:30-09:15** **M-F**	**PM** **15:00-18:30** **M-F**	**Phase Mode** **(Fixed/Demanded or Callable)**	**Remarks**
	Local Plan		Pattern 1	Pattern 2	Pattern 3		
	System Plan		(Plan 1)	(Plan 2)	(Plan 3)		
1 NOT USED	WLK						Pedestrian Minimums: EWWK = 7 sec, EWFD = 9 sec NSWK = 7 sec, NSFD = 23 sec
	FDW						NS phase is callable by vehicle or pedestrian actuation. If a vehicle call is received, the minimum SBG is 7 seconds. If ongoing vehicle demand exists on the stopbar loop, the SBG is capable of providing vehicle extensions up to the maximum. If a pedestrian call is received, the pedestrian minimums will be served. The NSWK & NSFD are only displayed on the pedestrian signal heads if a pedestrian call is received. Extension time is based on vehicle demand. Unused extension time is given to the EWG.
	MIN						
	MAX1						
	AMB						
	ALR						
	SPLIT						
2 Finch Ave W 	WLK	7				Fixed	
	FDW	9					
	MIN	57					
	MAX1	57					
	AMB	4					
	ALR	2					
	SPLIT		63	72	72		The signal constantly cycles through main street FDW to improve response to side street vehicle and pedestrian.
3 NOT USED	WLK						EWFD reverts to EWWK if there is no side street vehicle demand at the end of the EWFD.
	FDW						NS pushbutton monitored on local detector 2.
	MIN						Side Street Passage Time = 3 sec
	MAX1						
	AMB						
	ALR						
	SPLIT						
4 NOT USED	WLK	7					
	FDW	23					
	MIN	7					
	MAX1	30					
	AMB	3					
	ALR	3					
	SPLIT		37	38	38		
5 NOT USED	WLK						
	FDW						
	MIN						
	MAX1						
	AMB						
	ALR						
	SPLIT						
6 Finch Ave W 	WLK	7				Fixed	
	FDW	9					
	MIN	57					
	MAX1	57					
	AMB	4					
	ALR	2					
	SPLIT		63	72	72		
7 NOT USED	WLK						
	FDW						
	MIN						
	MAX1						
	AMB						
	ALR						
	SPLIT						
8 Hwy 400 West Ramp 	WLK	7				Callable by Stopbar Loop and/or Push Button Extendable by Stopbar Loop	
	FDW	23					
	MIN	7					
	MAX1	30					
	AMB	3					
	ALR	3					
	SPLIT		37	38	38		
	CL		100	110	110		
	OF		82	93	16		
	VP		9	9	9		

NOTES: T-Intersection, no South leg.
No pedestrian crossing on South & East side.
Picked Up on TransSuite on June 7, 2013 at 09:40 a.m

CITY OF TORONTO - TRANSPORTATION SERVICES
TRAFFIC MANAGEMENT CENTRE - URBAN TRAFFIC CONTROL SYSTEMS
703 Don Mills Rd, Toronto ON M3C 3N3
Phone: 416 397 5770, Fax 416 397 5777

CURRENT SIGNAL TIMING INFORMATION

Intersection: Finch Ave W & York Gate Blvd/Elana Dr.
PX: 1590
Date: May 29, 2014
Our Ref: 14093
Staff: WW/CL
System: MTSS
MOC: SA2-VMG
Implementation Date: September 14, 2010
Controller Type: EPIC 140
Issued to: AECOM (Lam Chit (Francis) Li)
Design Walk Speed: 1.2 m/s (FDW based on full crossing @1.2m/s)

PLAN	**AM PEAK**	**OFF PEAK**	**Pre-PM**	**PM PEAK**	**EVENING**
TIME PERIOD	**06:30 - 09:15** **Mon-Fri**	**All Other** **Times**	**15:00 - 15:45** **Mon-Fri**	**15:45 - 18:30** **Mon - Fri**	**22:00 - 06:30** **Mon-Fri** **22:00 - 09:15** **Sat,Sun, Holiday**
E-W PHASE					
*EBLA/EBG/EWWK (South side) or EWG/EWWK	18	15	11	21	6
*EBYA/EBG/EWWK (South side) or EWG/EWWK	2	2	2	2	2
*EBG/EWWK (South side) or EWG/EWWK	2	2	2	2	2
EWG/EWWK	50(27)	43(20)	57(34)	47(24)	52(29)
EWG/EWFD	16	16	16	16	16
EWY/EWDW	4	4	4	4	4
ALLR	2	2	2	2	2
N-S PHASE					
NSG/NSDW or NSG/NSWK	7	7	7	7	7
NSG/NSDW or NSG/NSFD	2(25)	2(25)	2(25)	2(25)	2(25)
NSY/NSDW	4	4	4	4	4
ALLR	3	3	3	3	3
CYCLE LENGTH	110	100	110	110	100
OFFSETS(E-W)	96	80	15	13	80

COMMENTS:
*EBLA is callable 24 hrs by setback loop. Unused time allocated to EWG.
NS phase is callable by vehicle and/or pedestrian actuation.
If a vehicle call is received,the minimum NSG is 9 seconds in all periods. If ongoing vehicle demand exists on the stopbar loop,
the NSG is capable of providing vehicle extensions up to a max of 32 seconds in all periods.
If a pedestrian call is received,the maximum extensions are served.
Extension time is dependent on vehicle and pedestrian actuation and time is taken from EWG/EWWK.
The NSWK & NSFD are only displayed on the pedestrian signal heads if a pedestrian call is received.
EWFD reverts to EWWK if there is no side street vehicle demand at the end the EWFD.
This intersection is equipped with Transit Priority providing a maximum extension of 28 seconds on EWG/EWWK phase

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰	↑↑	↱	↰	↑↑	↱	↰	↑↑	↱
Volume (vph)	175	976	207	134	692	69	206	468	65	233	640	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	6.0	6.0	1.0	6.0	6.0	1.0	6.0	6.0	1.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.96	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1785	3510	1470	1737	3510	1512	1752	3544	1565	1801	3476	1387
Flt Permitted	0.27	1.00	1.00	0.12	1.00	1.00	0.21	1.00	1.00	0.31	1.00	1.00
Satd. Flow (perm)	505	3510	1470	214	3510	1512	382	3544	1565	591	3476	1387
Peak-hour factor, PHF	0.85	0.90	0.79	0.87	0.93	0.88	0.84	0.86	0.84	0.94	0.94	0.88
Adj. Flow (vph)	206	1084	262	154	744	78	245	544	77	248	681	128
RTOR Reduction (vph)	0	0	142	0	0	47	0	0	56	0	0	93
Lane Group Flow (vph)	206	1084	120	154	744	31	245	544	21	248	681	35
Confl. Peds. (#/hr)	40		50	50		40	31		33	33		31
Heavy Vehicles (%)	2%	4%	5%	5%	4%	3%	4%	3%	0%	1%	5%	13%
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	53.3	43.2	43.2	53.7	43.4	43.4	38.6	28.8	28.8	38.4	28.7	28.7
Effective Green, g (s)	55.3	44.2	44.2	55.7	44.4	44.4	40.6	29.8	29.8	40.4	29.7	29.7
Actuated g/C Ratio	0.50	0.40	0.40	0.51	0.40	0.40	0.37	0.27	0.27	0.37	0.27	0.27
Clearance Time (s)	2.0	7.0	7.0	2.0	7.0	7.0	2.0	7.0	7.0	2.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	383	1410	591	265	1417	610	276	960	424	335	939	374
v/s Ratio Prot	0.05	c0.31		c0.06	0.21		c0.09	0.15		0.07	c0.20	
v/s Ratio Perm	0.22		0.08	0.24		0.02	0.24		0.01	0.20		0.02
v/c Ratio	0.54	0.77	0.20	0.58	0.53	0.05	0.89	0.57	0.05	0.74	0.73	0.09
Uniform Delay, d1	16.3	28.5	21.4	18.8	24.8	20.0	27.4	34.5	29.6	26.4	36.4	30.1
Progression Factor	0.72	0.88	1.13	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.4	3.8	0.7	3.2	1.4	0.2	27.1	0.8	0.0	8.5	2.8	0.1
Delay (s)	13.1	29.0	24.9	22.0	26.2	20.1	54.5	35.3	29.7	34.9	39.3	30.2
Level of Service	B	C	C	C	C	C	D	D	C	C	D	C
Approach Delay (s)		26.2			25.1			40.2			37.1	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	31.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	95.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

6: Finch Ave. West & York Gate Blvd.

Existing AM Peak Hour

	↰	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱			✥		↰		↱
Volume (vph)	243	1452	12	11	1023	21	27	1	17	10	0	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0		5.0	5.0			6.0		6.0		6.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00		1.00		1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.94		1.00		0.92
Flpb, ped/bikes	1.00	1.00		0.99	1.00			0.96		0.89		1.00
Frt	1.00	1.00		1.00	0.99			0.95		1.00		0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97		0.95		1.00
Satd. Flow (prot)	1806	5022		1803	4963			1593		1627		1496
Flt Permitted	0.20	1.00		0.15	1.00			0.97		0.77		1.00
Satd. Flow (perm)	371	5022		280	4963			1593		1316		1496
Peak-hour factor, PHF	0.78	0.93	0.43	0.55	0.91	0.40	0.68	0.92	0.61	0.88	0.92	0.75
Adj. Flow (vph)	312	1561	28	20	1124	52	40	1	28	11	0	307
RTOR Reduction (vph)	0	0	0	0	3	0	0	19	0	0	0	274
Lane Group Flow (vph)	312	1589	0	20	1173	0	0	50	0	11	0	33
Confl. Peds. (#/hr)	38		86	86		38	20		36	36		20
Heavy Vehicles (%)	1%	4%	0%	0%	5%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt			Perm			Perm			custom		custom
Protected Phases	7	4			8			2				
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	86.0	86.0		65.2	65.2			11.0		11.0		11.0
Effective Green, g (s)	87.0	87.0		66.2	66.2			12.0		12.0		12.0
Actuated g/C Ratio	0.79	0.79		0.60	0.60			0.11		0.11		0.11
Clearance Time (s)	2.0	6.0		6.0	6.0			7.0		7.0		7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0		3.0
Lane Grp Cap (vph)	552	3972		169	2987			174		144		163
v/s Ratio Prot	c0.10	c0.32			0.24							
v/s Ratio Perm	0.35			0.07				0.03		0.01		0.02
v/c Ratio	0.57	0.40		0.12	0.39			0.29		0.08		0.21
Uniform Delay, d1	4.5	3.5		9.4	11.4			45.1		44.0		44.7
Progression Factor	1.00	1.00		0.69	0.69			1.00		1.00		1.00
Incremental Delay, d2	1.3	0.3		1.2	0.3			0.9		0.2		0.6
Delay (s)	5.8	3.8		7.7	8.3			46.0		44.2		45.3
Level of Service	A	A		A	A			D		D		D
Approach Delay (s)		4.1			8.3			46.0			45.2	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	10.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	7.0
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

9: Finch Ave. West & Norfinch Dr.

Existing AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱		↰	↑	↱	↰	↑	↱
Volume (vph)	166	1565	313	182	1053	80	211	78	126	107	149	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0		1.0	6.0	6.0	1.0	6.0	6.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.98		1.00	1.00		1.00	1.00	0.88	1.00	1.00	0.92
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.98	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1807	4807		1807	4913		1670	1921	1397	1648	1812	1368
Flt Permitted	0.18	1.00		0.07	1.00		0.48	1.00	1.00	0.62	1.00	1.00
Satd. Flow (perm)	349	4807		141	4913		846	1921	1397	1069	1812	1368
Peak-hour factor, PHF	0.78	0.91	0.78	0.64	0.95	0.73	0.89	0.56	0.58	0.69	0.74	0.75
Adj. Flow (vph)	213	1720	401	284	1108	110	237	139	217	155	201	155
RTOR Reduction (vph)	0	30	0	0	8	0	0	0	0	0	0	123
Lane Group Flow (vph)	213	2091	0	284	1210	0	237	139	217	155	201	32
Confl. Peds. (#/hr)	14		57	57		14	60		97	97		60
Heavy Vehicles (%)	1%	4%	5%	1%	5%	6%	7%	0%	3%	5%	6%	10%
Turn Type	pm+pt			pm+pt			pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	63.6	50.1		74.0	56.5		30.0	24.0	24.0	30.0	24.0	24.0
Effective Green, g (s)	65.6	51.1		75.0	57.5		32.0	25.0	25.0	32.0	25.0	25.0
Actuated g/C Ratio	0.55	0.43		0.62	0.48		0.27	0.21	0.21	0.27	0.21	0.21
Clearance Time (s)	4.0	7.0		4.0	7.0		2.0	7.0	7.0	2.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	367	2047		378	2354		274	400	291	319	378	285
v/s Ratio Prot	0.07	c0.43		c0.13	0.25		c0.05	0.07		0.03	0.11	
v/s Ratio Perm	0.25			0.34			0.18		c0.16	0.10		0.02
v/c Ratio	0.58	1.02		0.75	0.51		0.86	0.35	0.75	0.49	0.53	0.11
Uniform Delay, d1	14.6	34.5		34.4	21.6		41.6	40.5	44.5	36.1	42.3	38.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	25.5		8.2	0.8		23.5	0.5	9.9	1.2	1.4	0.2
Delay (s)	16.9	59.9		42.6	22.4		65.1	41.1	54.5	37.3	43.7	38.7
Level of Service	B	E		D	C		E	D	D	D	D	D
Approach Delay (s)		56.0			26.2			55.6			40.2	
Approach LOS		E			C			E			D	

Intersection Summary			
HCM Average Control Delay	45.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	102.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↱		↰	↑↑↑	Y	
Volume (veh/h)	1675	123	27	1253	62	32
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.75	0.62	0.93	0.65	0.67
Hourly flow rate (vph)	1821	164	44	1347	95	48
Pedestrians					93	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.2	
Percent Blockage					8	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	148			154		
pX, platoon unblocked			0.61		0.66	0.61
vC, conflicting volume			2078		2532	782
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			535		489	0
tC, single (s)			4.1		6.9	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		67	92
cM capacity (veh/h)			586		285	608

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1
Volume Total	728	728	528	44	449	449	449	143
Volume Left	0	0	0	44	0	0	0	95
Volume Right	0	0	164	0	0	0	0	48
cSH	1700	1700	1700	586	1700	1700	1700	347
Volume to Capacity	0.43	0.43	0.31	0.07	0.26	0.26	0.26	0.41
Queue Length 95th (m)	0.0	0.0	0.0	1.8	0.0	0.0	0.0	14.9
Control Delay (s)	0.0	0.0	0.0	11.6	0.0	0.0	0.0	22.5
Lane LOS				B				C
Approach Delay (s)	0.0			0.4				22.5
Approach LOS								C

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	47.6%	ICU Level of Service	A
Analysis Period (min)	15		

15: Finch Ave. West & Hwy 400 NB Off-Ramp

Existing AM Peak Hour

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑↑	↰↰	↱
Volume (vph)	1592	0	0	968	679	452
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	3.0
Lane Util. Factor	0.91			0.91	0.97	1.00
Frpb, ped/bikes	1.00			1.00	1.00	1.00
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	5043			4995	3471	1601
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	5043			4995	3471	1601
Peak-hour factor, PHF	0.97	0.92	0.92	0.88	0.92	0.92
Adj. Flow (vph)	1641	0	0	1100	738	491
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1641	0	0	1100	738	491
Confl. Peds. (#/hr)		6	6			
Heavy Vehicles (%)	4%	2%	2%	5%	2%	2%
Turn Type						Free
Protected Phases	4			8	2	
Permitted Phases						Free
Actuated Green, G (s)	68.5			68.5	29.5	110.0
Effective Green, g (s)	69.5			69.5	30.5	110.0
Actuated g/C Ratio	0.63			0.63	0.28	1.00
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	3186			3156	962	1601
v/s Ratio Prot	c0.33			0.22	c0.21	
v/s Ratio Perm						0.31
v/c Ratio	0.52			0.35	0.77	0.31
Uniform Delay, d1	11.1			9.6	36.5	0.0
Progression Factor	1.28			1.00	1.00	1.00
Incremental Delay, d2	0.5			0.3	3.7	0.5
Delay (s)	14.7			9.9	40.2	0.5
Level of Service	B			A	D	A
Approach Delay (s)	14.7			9.9	24.3	
Approach LOS	B			A	C	

Intersection Summary			
HCM Average Control Delay	16.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	81.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑		↰↰	↱
Volume (vph)	0	1114	1322	0	883	707
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		5.0	3.0
Lane Util. Factor		0.91	0.91		0.97	1.00
Frpb, ped/bikes		1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		4902	4995		3471	1555
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		4902	4995		3471	1555
Peak-hour factor, PHF	0.92	0.93	0.89	0.92	0.96	0.89
Adj. Flow (vph)	0	1198	1485	0	920	794
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1198	1485	0	920	794
Confl. Peds. (#/hr)				3		
Heavy Vehicles (%)	2%	7%	5%	2%	2%	5%
Turn Type						Free
Protected Phases		4	8		6	
Permitted Phases						Free
Actuated Green, G (s)		63.3	63.3		34.7	110.0
Effective Green, g (s)		64.3	64.3		35.7	110.0
Actuated g/C Ratio		0.58	0.58		0.32	1.00
Clearance Time (s)		6.0	6.0		6.0	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		2865	2920		1126	1555
v/s Ratio Prot		0.24	0.30		c0.27	
v/s Ratio Perm						c0.51
v/c Ratio		0.42	0.51		0.82	0.51
Uniform Delay, d1		12.6	13.5		34.1	0.0
Progression Factor		1.00	0.74		1.00	1.00
Incremental Delay, d2		0.5	0.6		4.7	1.2
Delay (s)		13.0	10.5		38.8	1.2
Level of Service		B	B		D	A
Approach Delay (s)		13.0	10.5		21.4	
Approach LOS		B	B		C	

Intersection Summary			
HCM Average Control Delay	15.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	5.0
Intersection Capacity Utilization	81.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

18: Norfinch Dr. & Medical Centre Access

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱			↰↑	Y	
Volume (veh/h)	358	19	70	254	1	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.43	0.58	0.89	0.25	0.44
Hourly flow rate (vph)	416	44	121	285	4	32
Pedestrians					8	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.2	
Percent Blockage					1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				153		
pX, platoon unblocked						
vC, conflicting volume			468		830	238
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			468		830	238
tC, single (s)			4.1		6.8	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.4
p0 queue free %			89		99	96
cM capacity (veh/h)			1089		276	743

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	278	183	216	190	36
Volume Left	0	0	121	0	4
Volume Right	0	44	0	0	32
cSH	1700	1700	1089	1700	625
Volume to Capacity	0.16	0.11	0.11	0.11	0.06
Queue Length 95th (m)	0.0	0.0	2.8	0.0	1.4
Control Delay (s)	0.0	0.0	5.3	0.0	11.1
Lane LOS			A		B
Approach Delay (s)	0.0		2.8		11.1
Approach LOS					B

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	33.6%	ICU Level of Service	A
Analysis Period (min)	15		

20: Plaza Access (south) & York Gate Blvd.

	↙	↖	↑	↗	↘	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑↱			↰↑
Volume (veh/h)	3	5	243	22	4	237
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.42	0.44	0.78	0.75	0.58	0.75
Hourly flow rate (vph)	7	11	312	29	7	316
Pedestrians	1					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			111			
pX, platoon unblocked						
vC, conflicting volume	499	171			342	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	499	171			342	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			99	
cM capacity (veh/h)	503	848			1227	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	19	208	133	112	211
Volume Left	7	0	0	7	0
Volume Right	11	0	29	0	0
cSH	670	1700	1700	1227	1700
Volume to Capacity	0.03	0.12	0.08	0.01	0.12
Queue Length 95th (m)	0.6	0.0	0.0	0.1	0.0
Control Delay (s)	10.5	0.0	0.0	0.5	0.0
Lane LOS	B			A	
Approach Delay (s)	10.5	0.0		0.2	
Approach LOS	B				

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	19.4%	ICU Level of Service	A
Analysis Period (min)	15		

22: Plaza Access (north) & York Gate Blvd.

	↙	↖	↑	↗	↘	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑↱			↰↑
Volume (veh/h)	16	17	223	25	28	225
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.63	0.80	0.83	0.52	0.47	0.75
Hourly flow rate (vph)	25	21	269	48	60	300
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			230			
pX, platoon unblocked						
vC, conflicting volume	562	158			317	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	562	158			317	
tC, single (s)	6.8	6.9			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	98			95	
cM capacity (veh/h)	439	865			1226	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	47	179	138	160	200
Volume Left	25	0	0	60	0
Volume Right	21	0	48	0	0
cSH	566	1700	1700	1226	1700
Volume to Capacity	0.08	0.11	0.08	0.05	0.12
Queue Length 95th (m)	2.0	0.0	0.0	1.2	0.0
Control Delay (s)	11.9	0.0	0.0	3.3	0.0
Lane LOS	B			A	
Approach Delay (s)	11.9	0.0		1.5	
Approach LOS	B				

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	27.3%	ICU Level of Service	A
Analysis Period (min)	15		

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	7:15	7:15	7:15	7:15	7:15	7:15
End Time	8:30	8:30	8:30	8:30	8:30	8:30
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intvls	1	1	1	1	1	1
Vehs Entered	7687	7585	7768	7746	7594	7675
Vehs Exited	7586	7533	7675	7550	7573	7584
Starting Vehs	294	356	310	263	363	315
Ending Vehs	395	408	403	459	384	407
Denied Entry Before	3	0	1	1	2	0
Denied Entry After	7	9	5	12	102	27
Travel Distance (km)	6486	6434	6512	6438	6468	6468
Travel Time (hr)	356.2	367.8	378.9	353.4	435.0	378.3
Total Delay (hr)	227.1	239.3	248.9	224.4	306.2	249.2
Total Stops	15177	15604	15591	14742	16435	15511
Fuel Used (l)	857.3	860.7	873.5	848.3	915.0	871.0

Interval #0 Information Seeding

Start Time	7:15
End Time	7:30
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	7:30
End Time	8:30
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	7687	7585	7768	7746	7594	7675
Vehs Exited	7586	7533	7675	7550	7573	7584
Starting Vehs	294	356	310	263	363	315
Ending Vehs	395	408	403	459	384	407
Denied Entry Before	3	0	1	1	2	0
Denied Entry After	7	9	5	12	102	27
Travel Distance (km)	6486	6434	6512	6438	6468	6468
Travel Time (hr)	356.2	367.8	378.9	353.4	435.0	378.3
Total Delay (hr)	227.1	239.3	248.9	224.4	306.2	249.2
Total Stops	15177	15604	15591	14742	16435	15511
Fuel Used (l)	857.3	860.7	873.5	848.3	915.0	871.0

Intersection: 3: Finch Ave. West & Jane St.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	R
Maximum Queue (m)	64.2	147.9	150.6	46.2	53.6	232.6	99.7	21.1	57.3	116.3	111.7	39.5
Average Queue (m)	34.8	64.1	73.4	17.7	28.2	58.7	56.2	7.4	39.4	43.5	41.3	6.1
95th Queue (m)	63.5	130.7	138.6	36.2	53.5	136.7	85.4	15.9	63.8	90.7	77.1	19.7
Link Distance (m)		224.2	224.2	224.2		316.6	316.6			186.2	186.2	
Upstream Blk Time (%)						0				0	0	
Queuing Penalty (veh)						0				0	0	
Storage Bay Dist (m)	62.0				55.0			109.0	55.0			57.0
Storage Blk Time (%)	3	7			1	5	0		13	3	1	0
Queuing Penalty (veh)	14	12			3	6	0		30	5	1	0

Intersection: 3: Finch Ave. West & Jane St.

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (m)	57.3	125.6	127.2	51.6
Average Queue (m)	43.9	58.1	58.7	10.7
95th Queue (m)	65.4	99.6	96.1	28.1
Link Distance (m)		165.3	165.3	
Upstream Blk Time (%)		0	0	
Queuing Penalty (veh)		0	0	
Storage Bay Dist (m)	55.0			88.0
Storage Blk Time (%)	9	3	0	0
Queuing Penalty (veh)	29	7	1	0

Intersection: 6: Finch Ave. West & York Gate Blvd.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	T	TR	L	T	T	TR	LTR	L	R
Maximum Queue (m)	59.7	95.8	101.3	80.8	9.7	59.8	54.4	59.7	26.4	16.4	43.7
Average Queue (m)	25.5	30.1	36.9	21.1	2.0	17.0	18.3	23.4	9.5	3.2	20.3
95th Queue (m)	51.6	78.1	87.5	58.1	7.3	39.9	41.9	48.1	21.1	11.2	36.0
Link Distance (m)		142.5	142.5	142.5		224.2	224.2	224.2	120.3	88.9	88.9
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (m)	65.0				50.0						
Storage Blk Time (%)	1	1				1					
Queuing Penalty (veh)	3	2				0					

Intersection: 9: Finch Ave. West & Norfinch Dr.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	T	R	L
Maximum Queue (m)	37.3	358.7	362.4	387.4	57.2	92.3	104.7	116.6	42.4	117.9	47.3	40.2
Average Queue (m)	29.5	275.1	271.4	265.6	37.2	45.9	58.9	67.5	36.2	53.8	25.2	18.0
95th Queue (m)	44.0	396.9	387.6	392.2	56.5	79.5	94.8	104.1	50.5	128.6	48.9	36.7
Link Distance (m)		354.6	354.6	354.6		129.8	129.8	129.8		124.6		
Upstream Blk Time (%)		3	2	2				0		6		
Queuing Penalty (veh)		22	12	14				0		0		
Storage Bay Dist (m)	35.0				55.0				40.0		45.0	38.0
Storage Blk Time (%)	7	52			1	4			26	3	3	1
Queuing Penalty (veh)	38	87			4	7			52	9	8	1

Intersection: 9: Finch Ave. West & Norfinch Dr.

Movement	SB	SB
Directions Served	T	R
Maximum Queue (m)	70.1	34.5
Average Queue (m)	28.9	11.6
95th Queue (m)	57.7	23.5
Link Distance (m)	135.2	135.2
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)	5	
Queuing Penalty (veh)	6	

Intersection: 13: Finch Ave. West & Pelican Gate

Movement	EB	WB	NB
Directions Served	TR	L	LR
Maximum Queue (m)	18.0	18.1	53.2
Average Queue (m)	1.6	4.6	19.0
95th Queue (m)	8.9	13.6	39.5
Link Distance (m)	129.8		75.9
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)		34.0	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 15: Finch Ave. West & Hwy 400 NB Off-Ramp

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	T	T	T	T	T	T	L	L	R
Maximum Queue (m)	268.2	274.8	275.8	65.8	72.6	84.2	123.0	121.6	44.9
Average Queue (m)	141.0	147.6	150.1	20.8	27.0	33.0	63.0	65.3	1.5
95th Queue (m)	236.9	240.8	242.8	48.4	58.3	67.4	102.4	99.0	22.8
Link Distance (m)	345.4	345.4	345.4	354.6	354.6	354.6	166.4	166.4	166.4
Upstream Blk Time (%)	0	0	0				0	0	
Queuing Penalty (veh)	1	1	1				0	0	
Storage Bay Dist (m)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 16: Finch Ave. West & Hwy 400 SB Off-Ramp

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	T	T	T	T	L	L	R
Maximum Queue (m)	75.4	63.8	81.8	100.3	110.5	117.0	170.1	172.3	136.0
Average Queue (m)	31.7	33.9	37.3	61.6	71.0	74.4	124.8	127.1	22.2
95th Queue (m)	54.8	53.6	64.9	91.7	101.7	106.1	190.2	188.9	115.9
Link Distance (m)	142.5	142.5	142.5	345.4	345.4	345.4	165.4	165.4	165.4
Upstream Blk Time (%)	0		0				14	15	2
Queuing Penalty (veh)	0		0				0	0	0
Storage Bay Dist (m)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 18: Norfinch Dr. & Medical Centre Access

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (m)	1.4	14.4	13.8
Average Queue (m)	0.0	5.2	4.0
95th Queue (m)	1.0	13.5	12.2
Link Distance (m)	65.9	135.2	91.9
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 20: Plaza Access (south) & York Gate Blvd.

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	9.0	1.8
Average Queue (m)	2.2	0.1
95th Queue (m)	8.5	1.3
Link Distance (m)	58.2	108.3
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 22: Plaza Access (north) & York Gate Blvd.

Movement	WB	SB
Directions Served	LR	LT
Maximum Queue (m)	12.0	11.7
Average Queue (m)	5.4	2.0
95th Queue (m)	12.1	8.6
Link Distance (m)	84.8	109.6
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 376

HCM Signalized Intersection Capacity Analysis
3: Finch Ave. West & Jane St.

Finch West LRT MSF EA Study
Existing PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰	↑↑	↱	↰	↑↑	↱	↰	↑↑	↱
Volume (vph)	181	1046	241	144	988	86	241	607	106	239	892	132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	6.0	6.0	1.0	6.0	6.0	1.0	6.0	6.0	1.0	6.0	6.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.93	1.00	1.00	0.93	1.00	1.00	0.95	1.00	1.00	0.93
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1788	3544	1476	1754	3579	1504	1788	3579	1529	1717	3544	1399
Flt Permitted	0.10	1.00	1.00	0.10	1.00	1.00	0.10	1.00	1.00	0.27	1.00	1.00
Satd. Flow (perm)	190	3544	1476	190	3579	1504	198	3579	1529	485	3544	1399
Peak-hour factor, PHF	0.90	0.95	0.93	0.90	0.96	0.85	0.94	0.88	0.80	0.90	0.87	0.79
Adj. Flow (vph)	201	1101	259	160	1029	101	256	690	132	266	1025	167
RTOR Reduction (vph)	0	0	127	0	0	65	0	0	86	0	0	107
Lane Group Flow (vph)	201	1101	132	160	1029	36	256	690	46	266	1025	60
Confl. Peds. (#/hr)	66		65	65		66	60		37	37		60
Heavy Vehicles (%)	2%	3%	3%	4%	2%	1%	2%	2%	2%	6%	3%	9%
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	46.9	38.6	38.6	45.5	37.9	37.9	46.3	37.1	37.1	45.3	36.6	36.6
Effective Green, g (s)	48.9	39.6	39.6	47.5	38.9	38.9	48.3	38.1	38.1	47.3	37.6	37.6
Actuated g/C Ratio	0.44	0.36	0.36	0.43	0.35	0.35	0.44	0.35	0.35	0.43	0.34	0.34
Clearance Time (s)	2.0	7.0	7.0	2.0	7.0	7.0	2.0	7.0	7.0	2.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	220	1276	531	204	1266	532	234	1240	530	317	1211	478
v/s Ratio Prot	c0.08	c0.31		0.06	0.29		c0.10	0.19		0.07	c0.29	
v/s Ratio Perm	0.33		0.09	0.28		0.02	0.38		0.03	0.29		0.04
v/c Ratio	0.91	0.86	0.25	0.78	0.81	0.07	1.09	0.56	0.09	0.84	0.85	0.13
Uniform Delay, d1	25.2	32.7	24.7	23.9	32.2	23.5	28.5	29.1	24.2	24.0	33.5	24.9
Progression Factor	1.39	0.87	0.60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	36.3	7.5	1.1	17.7	5.8	0.2	86.2	0.5	0.1	17.4	5.6	0.1
Delay (s)	71.3	35.8	15.9	41.6	38.0	23.8	114.7	29.7	24.3	41.4	39.2	25.0
Level of Service	E	D	B	D	D	C	F	C	C	D	D	C
Approach Delay (s)		37.0			37.4			49.2			37.9	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	39.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	100.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

6: Finch Ave. West & York Gate Blvd.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱			✥		↰		↱
Volume (vph)	326	1409	8	8	1337	31	54	4	20	63	0	386
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.0	5.0		5.0	5.0			6.0		6.0		6.0
Lane Util. Factor	1.00	0.91		1.00	0.91			1.00		1.00		1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.93		1.00		0.89
Flpb, ped/bikes	1.00	1.00		0.98	1.00			0.93		0.80		1.00
Frt	1.00	1.00		1.00	1.00			0.97		1.00		0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96		0.95		1.00
Satd. Flow (prot)	1807	5076		1782	5059			1528		1462		1426
Flt Permitted	0.12	1.00		0.17	1.00			0.96		0.71		1.00
Satd. Flow (perm)	234	5076		320	5059			1528		1095		1426
Peak-hour factor, PHF	0.85	0.98	0.58	0.50	0.97	0.86	0.64	0.92	0.83	0.75	0.92	0.87
Adj. Flow (vph)	384	1438	14	16	1378	36	84	4	24	84	0	444
RTOR Reduction (vph)	0	0	0	0	2	0	0	11	0	0	0	341
Lane Group Flow (vph)	384	1452	0	16	1412	0	0	101	0	84	0	103
Confl. Peds. (#/hr)	30		130	130		30	27		98	98		27
Heavy Vehicles (%)	1%	3%	0%	0%	3%	10%	2%	0%	0%	0%	0%	2%
Turn Type	pm+pt			Perm			Perm			custom		custom
Protected Phases	7	4			8			2				
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	81.2	81.2		55.5	55.5			15.8		15.8		15.8
Effective Green, g (s)	82.2	82.2		56.5	56.5			16.8		16.8		16.8
Actuated g/C Ratio	0.75	0.75		0.51	0.51			0.15		0.15		0.15
Clearance Time (s)	2.0	6.0		6.0	6.0			7.0		7.0		7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0		3.0
Lane Grp Cap (vph)	528	3793		164	2598			233		167		218
v/s Ratio Prot	c0.16	0.29			c0.28							
v/s Ratio Perm	0.38			0.05				0.07		c0.08		0.07
v/c Ratio	0.73	0.38		0.10	0.54			0.43		0.50		0.47
Uniform Delay, d1	20.9	4.9		13.7	18.0			42.3		42.8		42.6
Progression Factor	1.00	1.00		0.56	0.55			1.00		1.00		1.00
Incremental Delay, d2	5.0	0.3		0.7	0.5			1.3		2.4		1.6
Delay (s)	25.9	5.2		8.3	10.3			43.6		45.1		44.2
Level of Service	C	A		A	B			D		D		D
Approach Delay (s)		9.5			10.3			43.6			44.3	
Approach LOS		A			B			D			D	

Intersection Summary			
HCM Average Control Delay	15.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

9: Finch Ave. West & Norfinch Dr.

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱		↰	↑	↱	↰	↑	↱
Volume (vph)	122	1457	234	129	1619	68	388	114	166	163	145	207
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0		1.0	6.0	6.0	1.0	6.0	6.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.95	1.00	1.00	0.92
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.98	1.00	1.00	0.98	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1690	4917		1789	5090		1746	1812	1523	1772	1847	1477
Flt Permitted	0.07	1.00		0.07	1.00		0.52	1.00	1.00	0.65	1.00	1.00
Satd. Flow (perm)	124	4917		134	5090		951	1812	1523	1207	1847	1477
Peak-hour factor, PHF	0.80	0.96	0.90	0.87	0.91	0.59	0.86	0.89	0.85	0.92	0.91	0.74
Adj. Flow (vph)	152	1518	260	148	1779	115	451	128	195	177	159	280
RTOR Reduction (vph)	0	17	0	0	6	0	0	0	0	0	0	102
Lane Group Flow (vph)	152	1761	0	148	1888	0	451	128	195	177	159	178
Confl. Peds. (#/hr)	30		47	47		30	57		32	32		57
Heavy Vehicles (%)	8%	3%	4%	2%	2%	0%	2%	6%	2%	1%	4%	2%
Turn Type	pm+pt			pm+pt			pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	69.4	56.5		66.6	55.1		37.9	22.0	22.0	36.1	21.1	21.1
Effective Green, g (s)	71.4	57.5		68.6	56.1		39.9	23.0	23.0	38.1	22.1	22.1
Actuated g/C Ratio	0.57	0.46		0.55	0.45		0.32	0.18	0.18	0.30	0.18	0.18
Clearance Time (s)	4.0	7.0		4.0	7.0		2.0	7.0	7.0	2.0	7.0	7.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	245	2262		239	2284		411	333	280	440	327	261
v/s Ratio Prot	c0.07	0.36		0.06	c0.37		c0.15	0.07		0.05	0.09	
v/s Ratio Perm	0.29			0.28			0.20		c0.13	0.07		0.12
v/c Ratio	0.62	0.78		0.62	0.83		1.10	0.38	0.70	0.40	0.49	0.68
Uniform Delay, d1	27.4	28.4		23.9	30.2		40.6	44.8	47.7	33.6	46.3	48.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.8	2.7		4.7	3.6		73.3	0.7	7.3	0.6	1.1	7.1
Delay (s)	32.2	31.1		28.6	33.8		113.9	45.5	55.1	34.2	47.5	55.3
Level of Service	C	C		C	C		F	D	E	C	D	E
Approach Delay (s)		31.2			33.4			87.8			47.2	
Approach LOS		C			C			F			D	

Intersection Summary			
HCM Average Control Delay	42.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	110.8%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↱		↰	↑↑↑	↰↱	
Volume (veh/h)	1689	97	27	1750	66	54
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.90	0.75	0.94	0.75	0.84
Hourly flow rate (vph)	1741	108	36	1862	88	64
Pedestrians					79	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.2	
Percent Blockage					7	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)	148			154		
pX, platoon unblocked			0.72		0.81	0.72
vC, conflicting volume			1928		2567	713
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			903		583	0
tC, single (s)			4.1		6.9	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		71	91
cM capacity (veh/h)			508		308	727

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1
Volume Total	696	696	456	36	621	621	621	152
Volume Left	0	0	0	36	0	0	0	88
Volume Right	0	0	108	0	0	0	0	64
cSH	1700	1700	1700	508	1700	1700	1700	407
Volume to Capacity	0.41	0.41	0.27	0.07	0.37	0.37	0.37	0.37
Queue Length 95th (m)	0.0	0.0	0.0	1.7	0.0	0.0	0.0	13.0
Control Delay (s)	0.0	0.0	0.0	12.6	0.0	0.0	0.0	19.1
Lane LOS				B				C
Approach Delay (s)	0.0			0.2				19.1
Approach LOS								C

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑			↑↑↑	↰↰	↱
Volume (vph)	1414	0	0	1448	479	399
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0			5.0	5.0	3.0
Lane Util. Factor	0.91			0.91	0.97	1.00
Frpb, ped/bikes	1.00			1.00	1.00	1.00
Flpb, ped/bikes	1.00			1.00	1.00	1.00
Frt	1.00			1.00	1.00	0.85
Flt Protected	1.00			1.00	0.95	1.00
Satd. Flow (prot)	5092			5092	3161	1555
Flt Permitted	1.00			1.00	0.95	1.00
Satd. Flow (perm)	5092			5092	3161	1555
Peak-hour factor, PHF	0.97	0.92	0.92	0.94	0.92	0.85
Adj. Flow (vph)	1458	0	0	1540	521	469
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	1458	0	0	1540	521	469
Confl. Peds. (#/hr)		23	23			
Heavy Vehicles (%)	3%	0%	0%	3%	12%	5%
Turn Type						Free
Protected Phases	4			8	2	
Permitted Phases						Free
Actuated Green, G (s)	74.3			74.3	23.7	110.0
Effective Green, g (s)	75.3			75.3	24.7	110.0
Actuated g/C Ratio	0.68			0.68	0.22	1.00
Clearance Time (s)	6.0			6.0	6.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	3486			3486	710	1555
v/s Ratio Prot	0.29			c0.30	c0.16	
v/s Ratio Perm						0.30
v/c Ratio	0.42			0.44	0.73	0.30
Uniform Delay, d1	7.7			7.8	39.6	0.0
Progression Factor	0.68			1.00	1.00	1.00
Incremental Delay, d2	0.3			0.4	3.9	0.5
Delay (s)	5.5			8.3	43.5	0.5
Level of Service	A			A	D	A
Approach Delay (s)	5.5			8.3	23.1	
Approach LOS	A			A	C	

Intersection Summary			
HCM Average Control Delay	11.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↑		↰↰	↱
Volume (vph)	0	1641	1399	0	546	556
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	5.0		5.0	3.0
Lane Util. Factor		0.91	0.91		0.97	1.00
Frpb, ped/bikes		1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00
Frt		1.00	1.00		1.00	0.85
Flt Protected		1.00	1.00		0.95	1.00
Satd. Flow (prot)		5092	4902		3404	1498
Flt Permitted		1.00	1.00		0.95	1.00
Satd. Flow (perm)		5092	4902		3404	1498
Peak-hour factor, PHF	0.92	0.94	0.96	0.92	0.88	0.94
Adj. Flow (vph)	0	1746	1457	0	620	591
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	1746	1457	0	620	591
Confl. Peds. (#/hr)				8		
Heavy Vehicles (%)	2%	3%	7%	2%	4%	9%
Turn Type						Free
Protected Phases		4	8		6	
Permitted Phases						Free
Actuated Green, G (s)		72.6	72.6		25.4	110.0
Effective Green, g (s)		73.6	73.6		26.4	110.0
Actuated g/C Ratio		0.67	0.67		0.24	1.00
Clearance Time (s)		6.0	6.0		6.0	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		3407	3280		817	1498
v/s Ratio Prot		c0.34	0.30		c0.18	
v/s Ratio Perm						0.39
v/c Ratio		0.51	0.44		0.76	0.39
Uniform Delay, d1		9.2	8.6		38.8	0.0
Progression Factor		1.00	0.78		1.00	1.00
Incremental Delay, d2		0.6	0.4		4.1	0.8
Delay (s)		9.7	7.1		42.9	0.8
Level of Service		A	A		D	A
Approach Delay (s)		9.7	7.1		22.4	
Approach LOS		A	A		C	

Intersection Summary			
HCM Average Control Delay	12.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	71.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱			↰↑	Y	
Volume (veh/h)	439	9	56	248	10	76
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.75	0.70	0.87	0.50	0.79
Hourly flow rate (vph)	556	12	80	285	20	96
Pedestrians					23	
Lane Width (m)					3.7	
Walking Speed (m/s)					1.2	
Percent Blockage					2	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (m)				152		
pX, platoon unblocked						
vC, conflicting volume			591		887	307
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			591		887	307
tC, single (s)			4.2		7.0	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.3
p0 queue free %			92		92	86
cM capacity (veh/h)			948		241	678

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	370	197	175	190	116
Volume Left	0	0	80	0	20
Volume Right	0	12	0	0	96
cSH	1700	1700	948	1700	517
Volume to Capacity	0.22	0.12	0.08	0.11	0.22
Queue Length 95th (m)	0.0	0.0	2.1	0.0	6.5
Control Delay (s)	0.0	0.0	4.6	0.0	14.0
Lane LOS			A		B
Approach Delay (s)	0.0		2.2		14.0
Approach LOS					B

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	36.7%	ICU Level of Service	A
Analysis Period (min)	15		

20: Plaza Access (south) & York Gate Blvd.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰↱		↑↱			↰↑
Volume (veh/h)	65	12	286	75	6	384
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.65	0.43	0.84	0.94	0.50	0.86
Hourly flow rate (vph)	100	28	340	80	12	447
Pedestrians	18					2
Lane Width (m)	3.7					3.7
Walking Speed (m/s)	1.2					1.2
Percent Blockage	2					0
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			111			
pX, platoon unblocked						
vC, conflicting volume	646	230			438	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	646	230			438	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	75	96			99	
cM capacity (veh/h)	398	765			1115	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	128	227	193	161	298
Volume Left	100	0	0	12	0
Volume Right	28	0	80	0	0
cSH	445	1700	1700	1115	1700
Volume to Capacity	0.29	0.13	0.11	0.01	0.18
Queue Length 95th (m)	8.9	0.0	0.0	0.2	0.0
Control Delay (s)	16.3	0.0	0.0	0.7	0.0
Lane LOS	C			A	
Approach Delay (s)	16.3	0.0		0.2	
Approach LOS	C				

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	26.5%	ICU Level of Service	A
Analysis Period (min)	15		

	↙	↖	↑	↗	↘	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑↱			↰↑
Volume (veh/h)	91	79	241	52	59	299
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.78	0.89	0.88	0.87	0.76	0.87
Hourly flow rate (vph)	117	89	274	60	78	344
Pedestrians	8					
Lane Width (m)	3.7					
Walking Speed (m/s)	1.2					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (m)			230			
pX, platoon unblocked						
vC, conflicting volume	639	175			342	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	639	175			342	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	69	89			94	
cM capacity (veh/h)	382	839			1206	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	205	183	151	192	229
Volume Left	117	0	0	78	0
Volume Right	89	0	60	0	0
cSH	499	1700	1700	1206	1700
Volume to Capacity	0.41	0.11	0.09	0.06	0.13
Queue Length 95th (m)	15.1	0.0	0.0	1.6	0.0
Control Delay (s)	17.2	0.0	0.0	3.6	0.0
Lane LOS	C			A	
Approach Delay (s)	17.2	0.0		1.7	
Approach LOS	C				

Intersection Summary			
Average Delay	4.4		
Intersection Capacity Utilization	39.5%	ICU Level of Service	A
Analysis Period (min)	15		

SimTraffic Simulation Summary
Existing PM Peak Hour

6/3/2014

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	4:15	4:15	4:15	4:15	4:15	4:15
End Time	5:30	5:30	5:30	5:30	5:30	5:30
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intvls	1	1	1	1	1	1
Vehs Entered	8622	8786	8739	8987	8785	8782
Vehs Exited	8580	8674	8737	8870	8782	8726
Starting Vehs	382	368	383	367	393	377
Ending Vehs	424	480	385	484	396	429
Denied Entry Before	36	16	2	24	24	21
Denied Entry After	352	378	298	123	325	294
Travel Distance (km)	7370	7478	7435	7568	7532	7476
Travel Time (hr)	562.0	603.3	498.8	512.5	598.7	555.0
Total Delay (hr)	416.6	455.6	351.6	362.9	450.3	407.4
Total Stops	15869	17196	15294	18849	16181	16678
Fuel Used (l)	1102.3	1149.2	1055.4	1073.4	1150.6	1106.2

Interval #0 Information Seeding

Start Time	4:15
End Time	4:30
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	4:30
End Time	5:30
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	8622	8786	8739	8987	8785	8782
Vehs Exited	8580	8674	8737	8870	8782	8726
Starting Vehs	382	368	383	367	393	377
Ending Vehs	424	480	385	484	396	429
Denied Entry Before	36	16	2	24	24	21
Denied Entry After	352	378	298	123	325	294
Travel Distance (km)	7370	7478	7435	7568	7532	7476
Travel Time (hr)	562.0	603.3	498.8	512.5	598.7	555.0
Total Delay (hr)	416.6	455.6	351.6	362.9	450.3	407.4
Total Stops	15869	17196	15294	18849	16181	16678
Fuel Used (l)	1102.3	1149.2	1055.4	1073.4	1150.6	1106.2

Intersection: 3: Finch Ave. West & Jane St.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	R	L	T	T	R	L	T	T	R
Maximum Queue (m)	64.3	208.4	224.1	199.8	57.3	321.2	262.8	111.2	57.4	201.5	194.3	58.9
Average Queue (m)	56.9	137.4	142.9	64.8	35.6	119.0	112.3	21.0	56.7	170.6	147.9	14.4
95th Queue (m)	76.5	250.5	254.2	201.6	64.5	235.2	196.8	74.9	62.2	240.0	248.5	44.8
Link Distance (m)		224.2	224.2	224.2		316.6	316.6			186.2	186.2	
Upstream Blk Time (%)		6	7	2		0	0			62	3	
Queuing Penalty (veh)		30	36	7		0	0			0	0	
Storage Bay Dist (m)	62.0				55.0			109.0	55.0			57.0
Storage Blk Time (%)	40	28			6	25	8	0	84	47	6	0
Queuing Penalty (veh)	210	50			31	36	7	0	254	114	7	0

Intersection: 3: Finch Ave. West & Jane St.

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (m)	57.3	175.3	175.8	92.3
Average Queue (m)	52.0	144.0	140.8	39.6
95th Queue (m)	69.5	208.1	207.2	102.0
Link Distance (m)		165.3	165.3	
Upstream Blk Time (%)		19	14	
Queuing Penalty (veh)		0	0	
Storage Bay Dist (m)	55.0			88.0
Storage Blk Time (%)	33	24	28	0
Queuing Penalty (veh)	147	58	37	1

Intersection: 6: Finch Ave. West & York Gate Blvd.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	SB	SB
Directions Served	L	T	T	TR	L	T	T	TR	LTR	L	R
Maximum Queue (m)	67.4	136.8	135.8	115.1	7.2	39.5	43.0	59.5	45.1	48.7	85.8
Average Queue (m)	47.4	61.4	62.1	41.2	1.1	14.8	19.0	24.6	16.3	14.7	43.1
95th Queue (m)	76.2	134.5	131.1	104.3	5.1	31.1	36.4	47.0	32.9	33.1	73.7
Link Distance (m)		142.5	142.5	142.5		224.2	224.2	224.2	120.3	88.9	88.9
Upstream Blk Time (%)		2	2	0						0	0
Queuing Penalty (veh)		11	14	2						0	1
Storage Bay Dist (m)	65.0				50.0						
Storage Blk Time (%)	5	7				0					
Queuing Penalty (veh)	22	24				0					

Intersection: 9: Finch Ave. West & Norfinch Dr.

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	T	T	TR	L	T	T	TR	L	T	R	L
Maximum Queue (m)	37.4	218.9	263.2	244.0	57.3	131.3	131.9	138.4	42.4	267.2	47.5	40.4
Average Queue (m)	29.1	143.1	137.0	131.2	33.5	91.2	101.0	109.6	42.0	261.6	29.3	25.1
95th Queue (m)	44.0	263.1	250.1	254.4	62.9	138.6	143.7	148.8	46.3	264.4	56.5	43.9
Link Distance (m)		355.0	355.0	355.0		129.2	129.2	129.2		257.0		
Upstream Blk Time (%)		1	0	0		2	1	3		40		
Queuing Penalty (veh)		4	1	2		10	8	20		0		
Storage Bay Dist (m)	35.0				55.0				40.0		45.0	38.0
Storage Blk Time (%)	14	39			7	20			63	12	6	3
Queuing Penalty (veh)	66	48			37	25			175	68	28	4

Intersection: 9: Finch Ave. West & Norfinch Dr.

Movement	SB	SB
Directions Served	T	R
Maximum Queue (m)	85.9	53.0
Average Queue (m)	32.9	22.0
95th Queue (m)	67.3	42.1
Link Distance (m)	133.7	133.7
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)	5	
Queuing Penalty (veh)	7	

Intersection: 13: Finch Ave. West & Pelican Gate

Movement	EB	EB	EB	WB	WB	WB	WB	NB
Directions Served	T	T	TR	L	T	T	T	LR
Maximum Queue (m)	45.5	39.9	39.4	16.7	17.6	24.8	32.8	77.6
Average Queue (m)	4.1	3.6	3.4	4.3	1.6	1.4	4.4	33.9
95th Queue (m)	31.0	27.2	24.3	13.2	12.2	11.3	19.5	68.8
Link Distance (m)	129.2	129.2	129.2		142.5	142.5	142.5	75.9
Upstream Blk Time (%)	0							3
Queuing Penalty (veh)	0							0
Storage Bay Dist (m)				34.0				
Storage Blk Time (%)					0			
Queuing Penalty (veh)					0			

Intersection: 15: Finch Ave. West & Hwy 400 NB Off-Ramp

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	T	T	T	T	T	T	L	L
Maximum Queue (m)	98.2	99.6	101.6	72.0	85.0	93.7	89.7	97.0
Average Queue (m)	45.8	54.7	57.6	27.2	35.6	42.5	49.5	55.0
95th Queue (m)	88.2	93.8	93.4	62.6	75.2	83.9	78.6	83.1
Link Distance (m)	345.4	345.4	345.4	355.0	355.0	355.0	166.4	166.4
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (m)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 16: Finch Ave. West & Hwy 400 SB Off-Ramp

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	T	T	T	T	T	T	L	L
Maximum Queue (m)	117.3	117.2	121.2	86.8	99.7	105.7	102.2	105.2
Average Queue (m)	45.4	48.2	50.3	50.7	62.6	66.6	53.1	56.0
95th Queue (m)	89.2	93.2	88.1	84.5	92.6	98.4	85.8	88.7
Link Distance (m)	142.5	142.5	142.5	345.4	345.4	345.4	165.4	165.4
Upstream Blk Time (%)	0	0	0					
Queuing Penalty (veh)	0	0	0					
Storage Bay Dist (m)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 18: Norfinch Dr. & Medical Centre Access

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (m)	1.5	19.6	21.1
Average Queue (m)	0.0	5.5	10.3
95th Queue (m)	1.0	15.3	17.0
Link Distance (m)	65.9	133.7	91.9
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 20: Plaza Access (south) & York Gate Blvd.

Movement	WB	NB	NB	SB	SB
Directions Served	LR	T	TR	LT	T
Maximum Queue (m)	18.7	1.8	3.6	7.1	8.6
Average Queue (m)	10.1	0.1	0.1	0.4	0.4
95th Queue (m)	16.4	1.3	1.8	4.0	3.6
Link Distance (m)	58.2	88.9	88.9	108.3	108.3
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (m)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 22: Plaza Access (north) & York Gate Blvd.

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (m)	32.9	5.6	15.4
Average Queue (m)	13.5	0.3	3.9
95th Queue (m)	25.2	2.5	12.2
Link Distance (m)	84.8	108.3	109.6
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 1602

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Memorandum

To	Renée Pettigrew	Page 1
CC	David Brutto	
Subject	Existing Traffic Volume Data	
From	Francis Li	
Date	July 11, 2014	60318592

The assessment of the existing traffic conditions was performed based on the turning movement counts (TMC) and 24-hour link volume data collected on a typical weekday May 13, 2014. The TMC data was slightly adjusted and balanced at intersections where there are no commercial or other accesses in between. This memo includes figures, which illustrate the collected traffic data at study intersections, and should be understood in conjunction with traffic section 3.4 in the main report.

Figures G1 and **G2** illustrate the existing adjusted traffic volume during AM and PM peak hours, respectively.

Figures G3 to **G7** illustrate the existing 24-hour traffic volume profile along Finch Avenue West, Jane Street, York Gate Boulevard and Norfinch Avenue, at selected locations in vicinity of the proposed MSF site.

Memorandum

Figure G-1: Existing (Adjusted) AM Peak Hour Traffic Volume

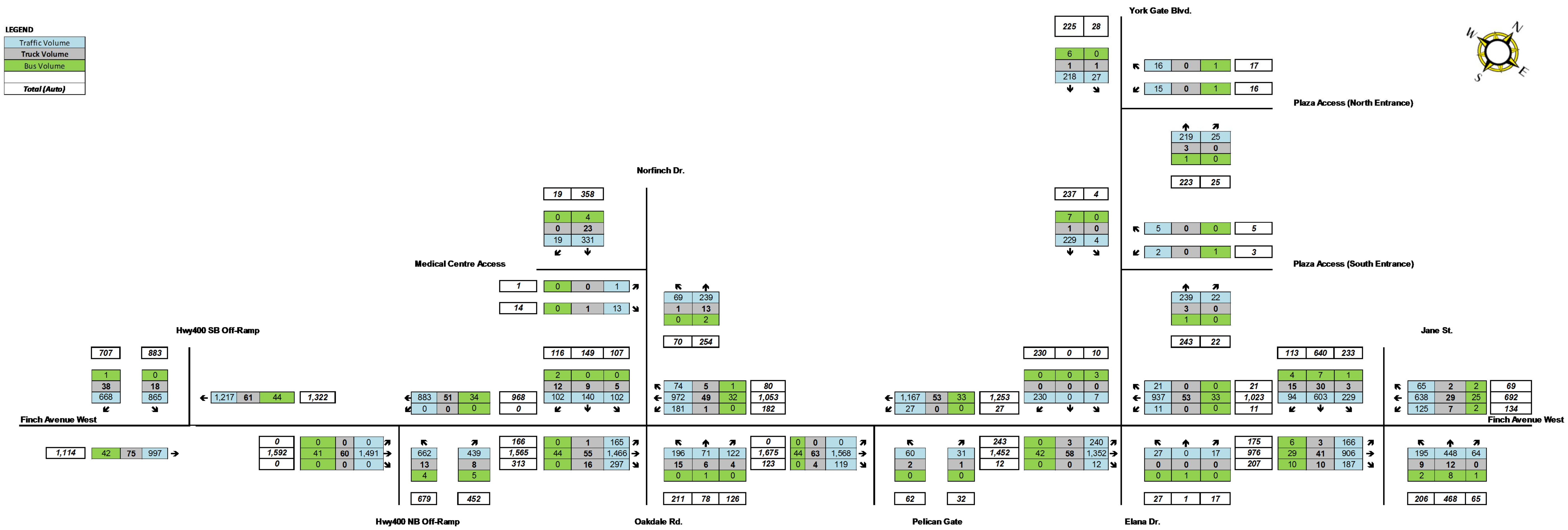
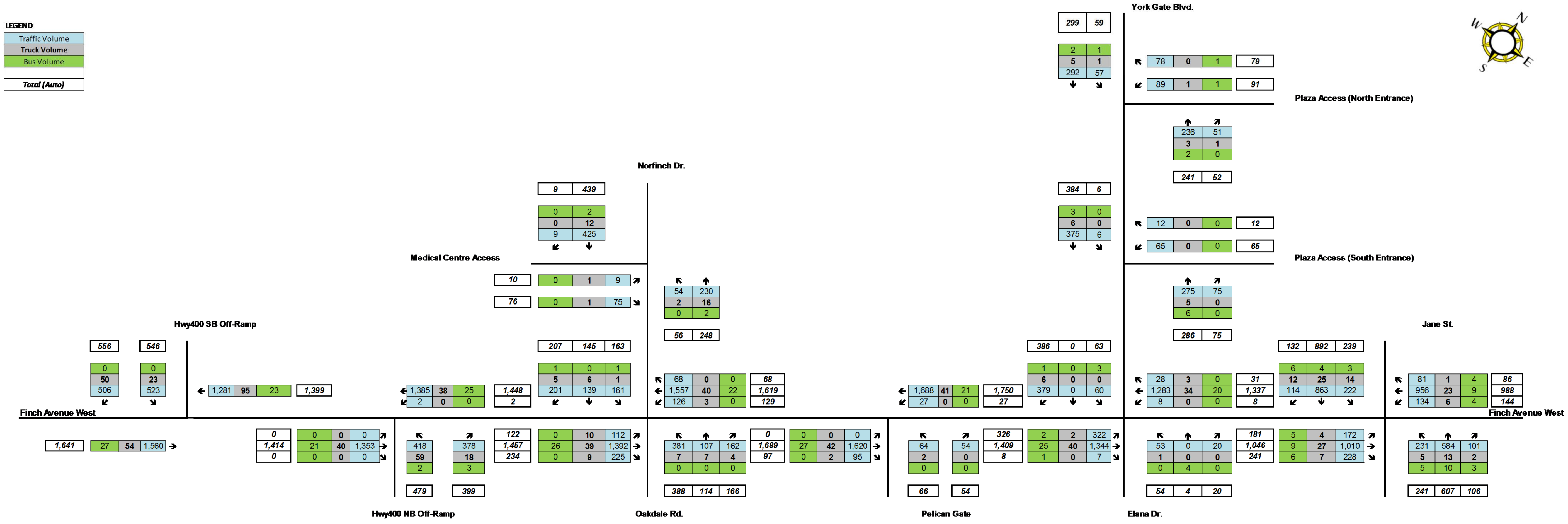


Figure G-2: Existing (Adjusted) PM Peak Hour Traffic Volume



Memorandum

Figure G-3: Existing 24-hour Traffic Volume Profile along Finch Avenue West (East of Pelican Gate)

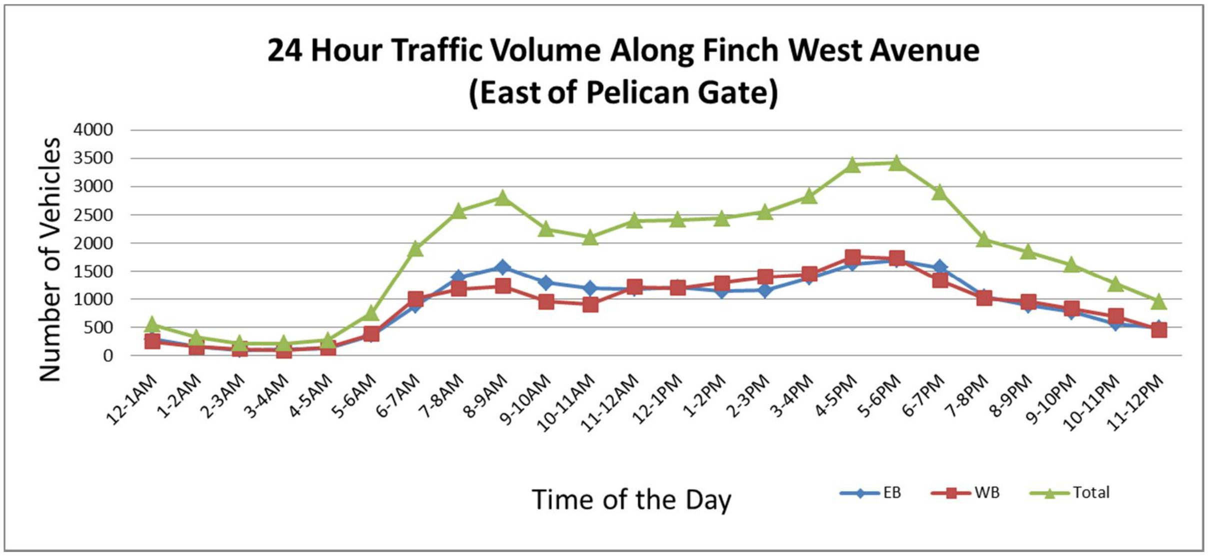


Figure G-4: Existing 24-hour Traffic Volume Profile along Finch Avenue West (West of Norfinch Drive)

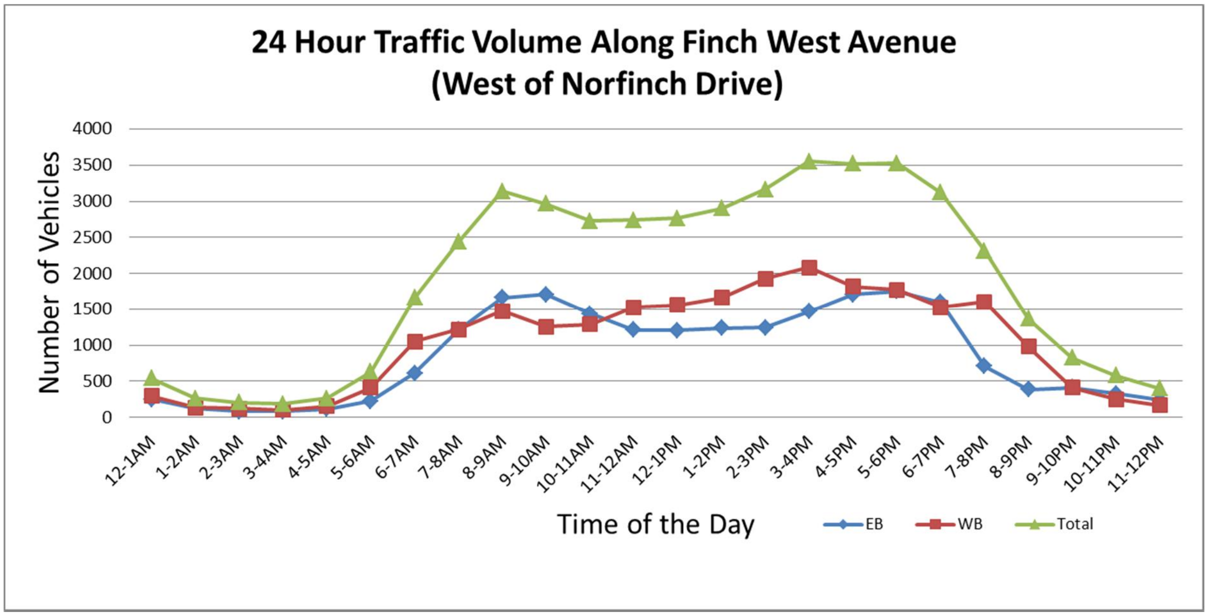


Figure G-5: Existing 24-hour Traffic Volume Profile along Jane St. (North of Finch Ave.)

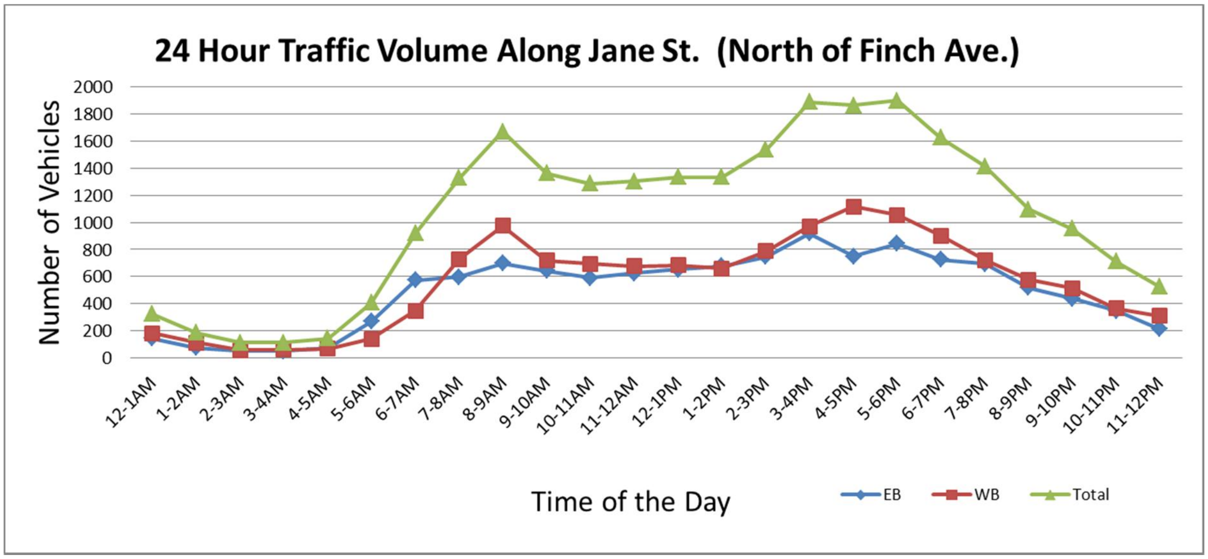


Figure G-6: Existing 24-hour Traffic Volume Profile along York Gate Blvd. (North of Finch Ave.)

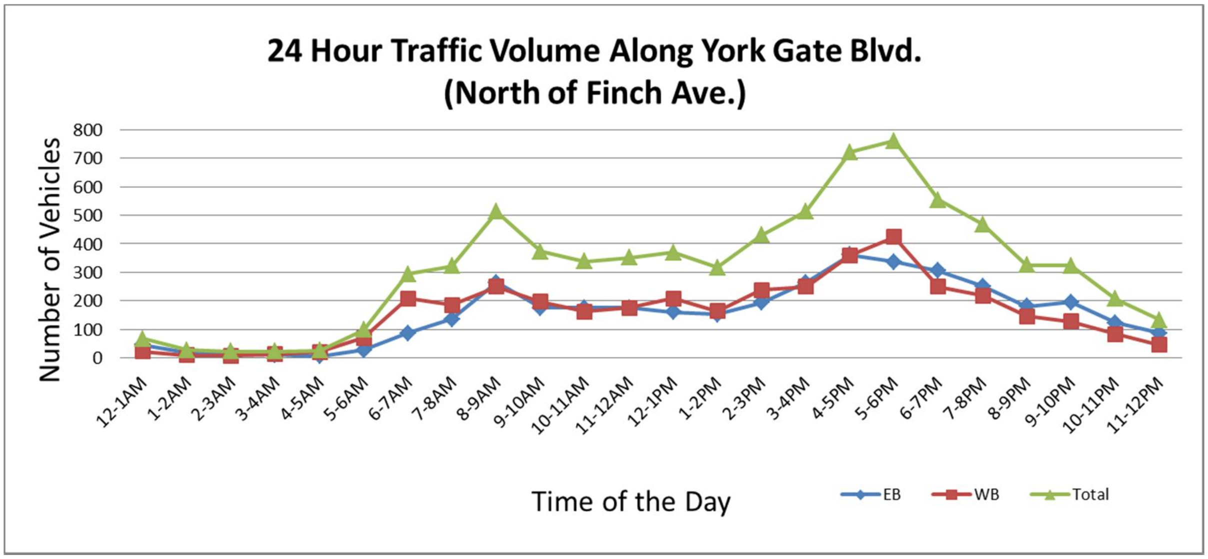
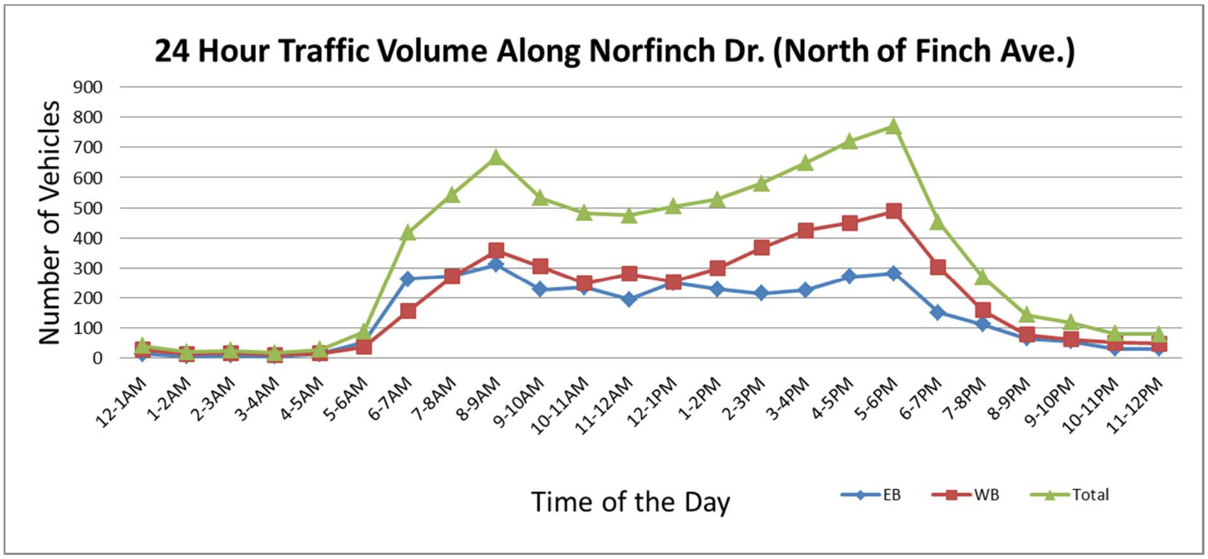


Figure G-7: Existing 24-hour Traffic Volume Profile along Norfinch Dr. (North of Finch Ave.)



G2. Impact Assessment (Future) Traffic Data

Figure 1: Future Background Traffic Volumes during AM Peak Period

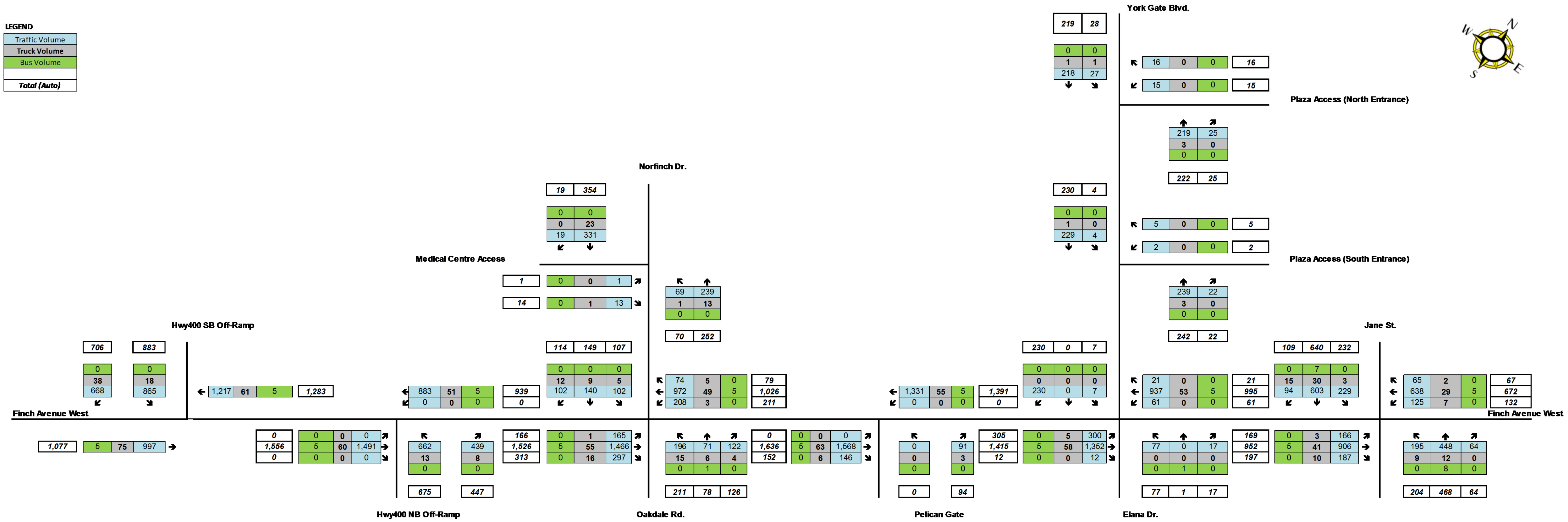


Figure 2: Future Background Traffic Volumes during PM Peak Period

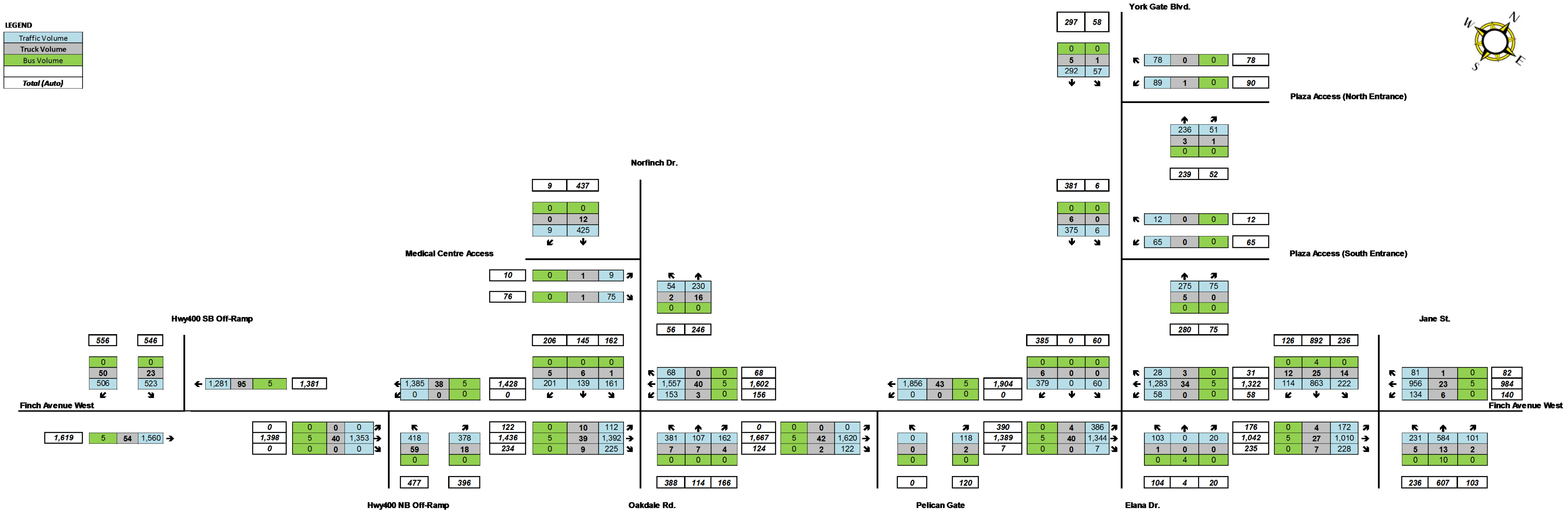


Figure 3: Future Background Traffic Volumes during Early Morning (5:00a.m.-6:00a.m.) Period

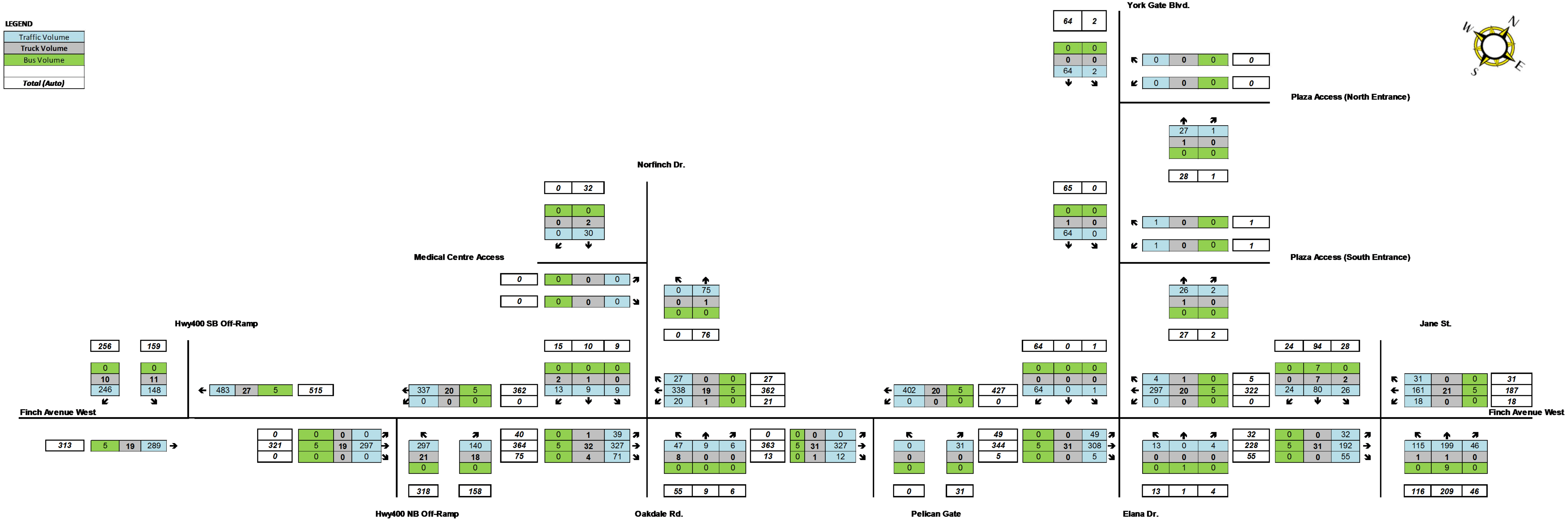


Figure 4: Staffing Requirement for Finch West Facility

Maintenance Staff Shift 1	Arrivals	Departures
	6:30 AM – 7:00 AM	3:00 PM – 4:00 PM
	60	*60*
Maintenance Staff Shift 2	Arrivals	Departures
	2:30 PM – 3:00 PM	11:00 PM – 12:00 AM
	60	*60*
Maintenance Staff Shift 3	Arrivals	Departures
	10:30 PM – 11:00 PM	7:00 AM – 8:00 AM
	50	*50*
Driver Staff Shift 1	Arrivals	Departures
	4:00 AM – 4:30 AM	12:00 PM – 1:00 PM
	36	*36*
Driver Staff Shift (Additional Shift in AM Peak hour)	Arrivals	Departures
	5:00 AM – 5:30 AM	1:00 PM – 2:00 PM
	36	*36*
Driver Staff Shift 2	Arrivals	Departures
	11:30 AM – 12:00 PM	8:00 PM – 9:00 PM
	36	*36*
Driver Staff Shift (Additional Shift in PM Peak hour)	Arrivals	Departures
	3:00 PM – 3:30 PM	6:00 PM – 7:00 PM
	36	*36*
Driver Staff Shift 3	Arrivals	Departures
	7:30 PM – 8:00 PM	1:00 AM – 2:00 AM
	36	*36*
Total	*350*	*350*

Figure 5: Site Traffic Volumes during Early Morning (5:00a.m.-6:00a.m.) Period (Option 1)

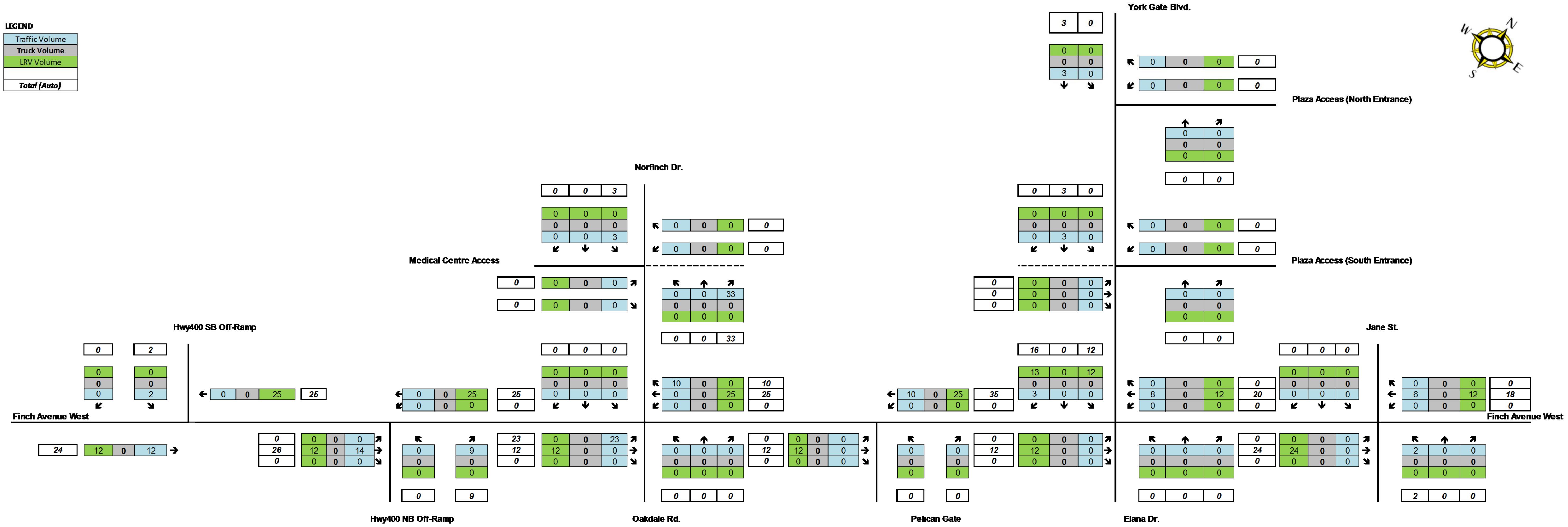


Figure 6: Site Traffic Volumes during AM Peak Period (Option 1)

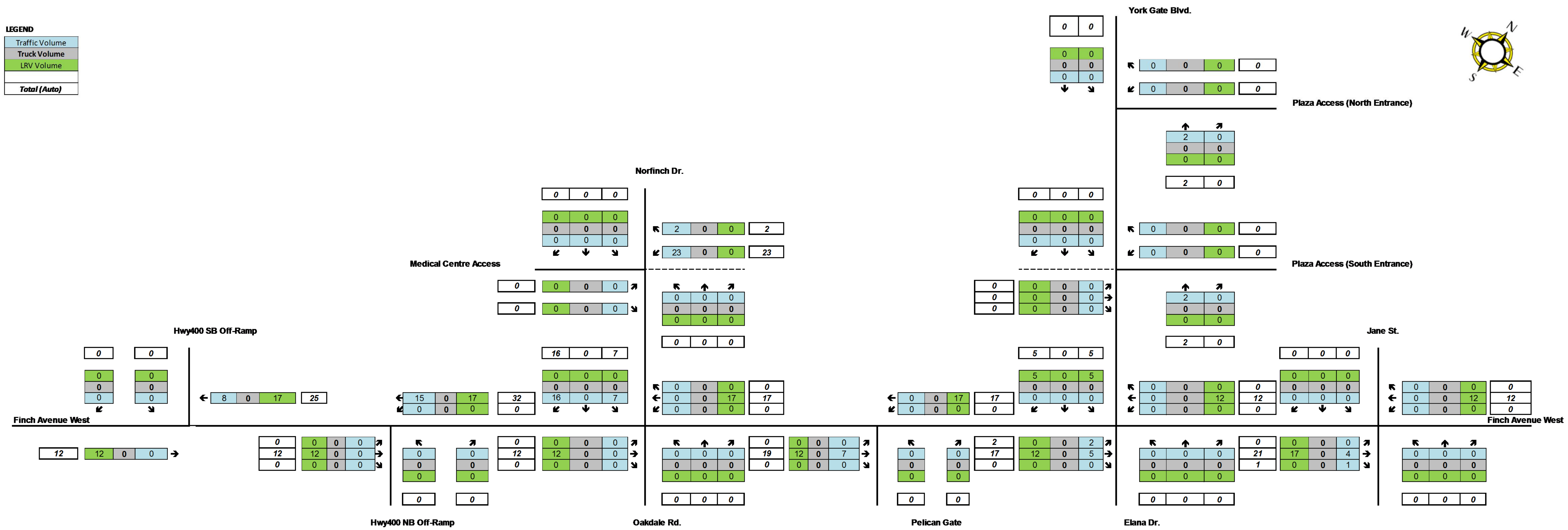


Figure 7: Site Traffic Volumes during PM Peak Period (Option 1)

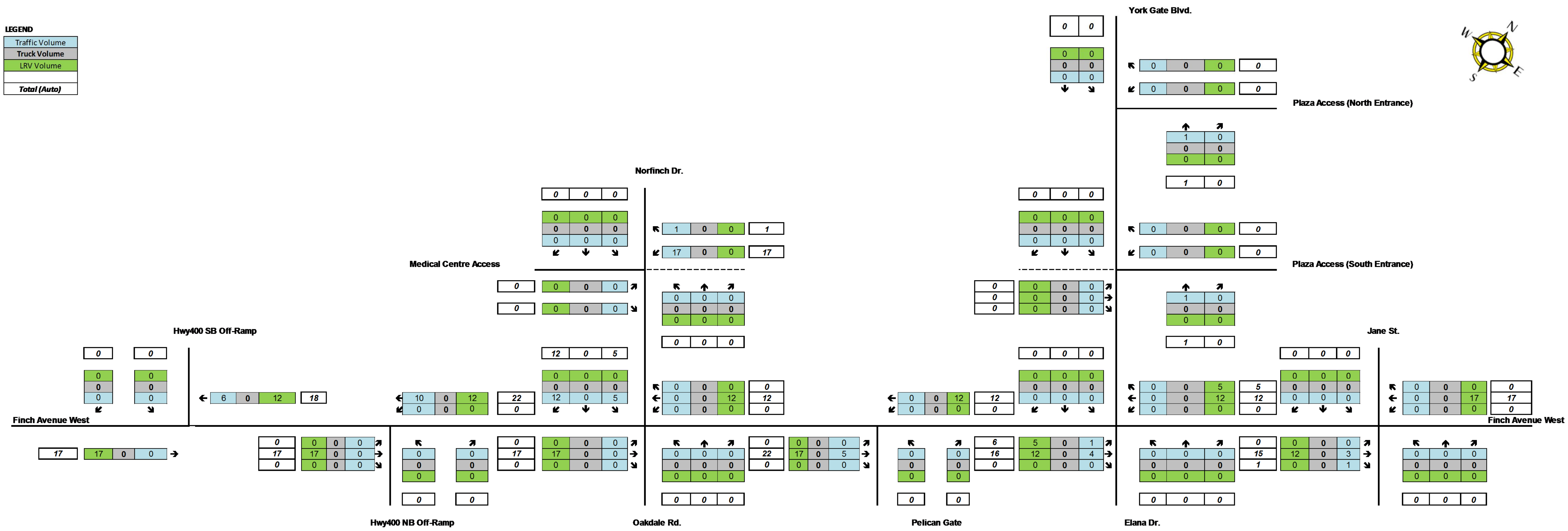


Figure 8: Site Traffic Volumes during Early Morning (5:00a.m.-6:00a.m.) Period (Option 2)

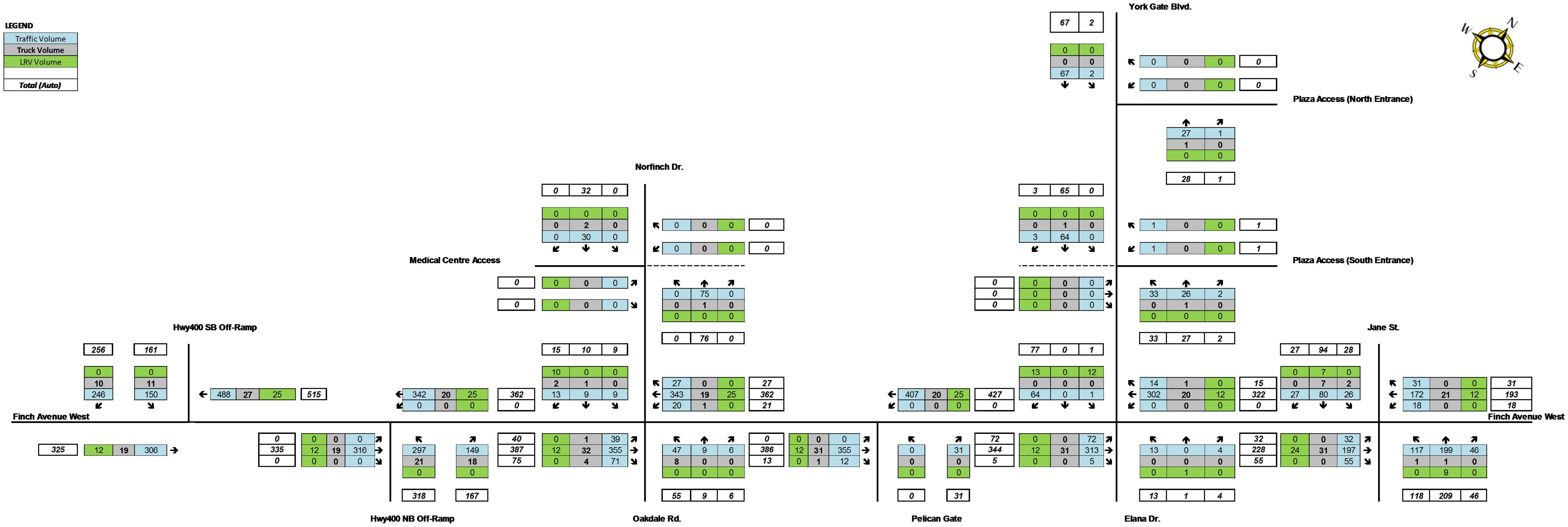


Figure 9: Site Traffic Volumes during AM Peak Period (Option 2)

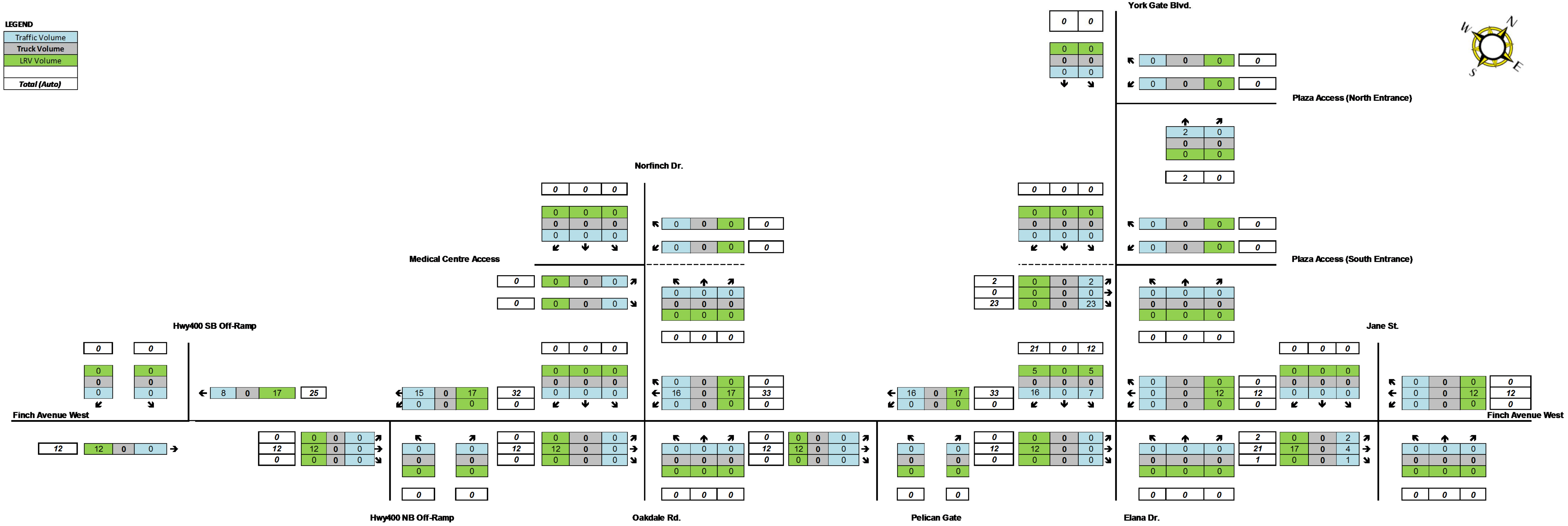


Figure 10: Site Traffic Volumes during PM Peak Period (Option 2)

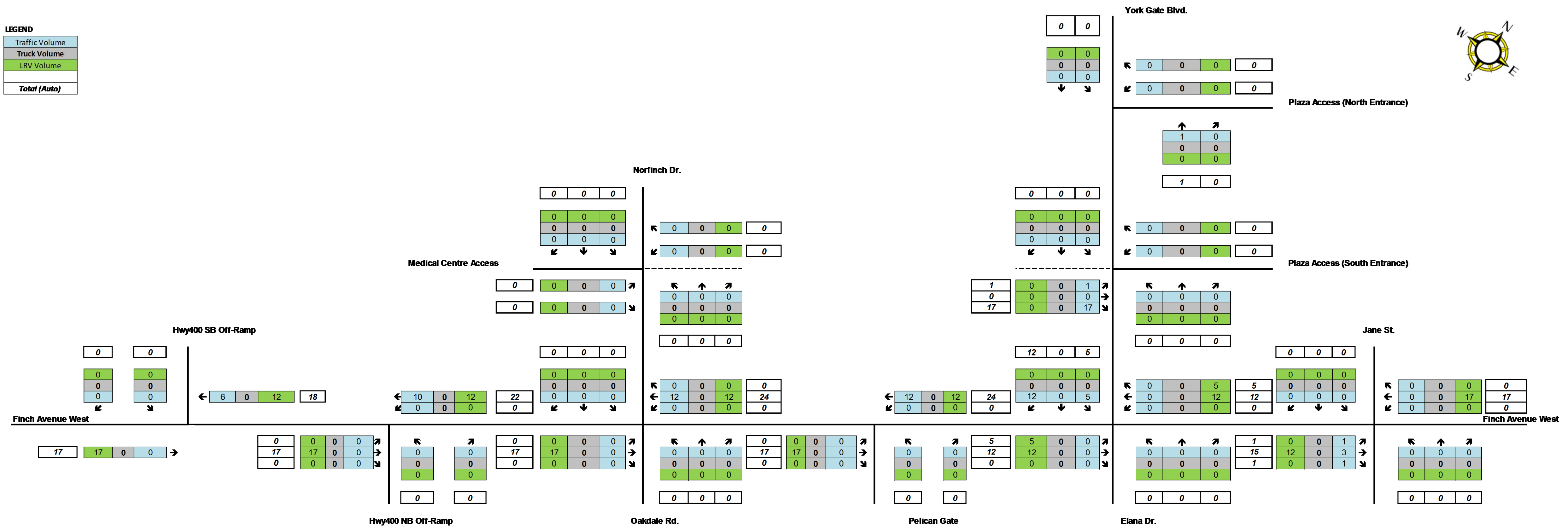


Figure 11: Future Total Traffic Volumes during Early Morning (5:00a.m.-6:00a.m.) Period (Option 1)

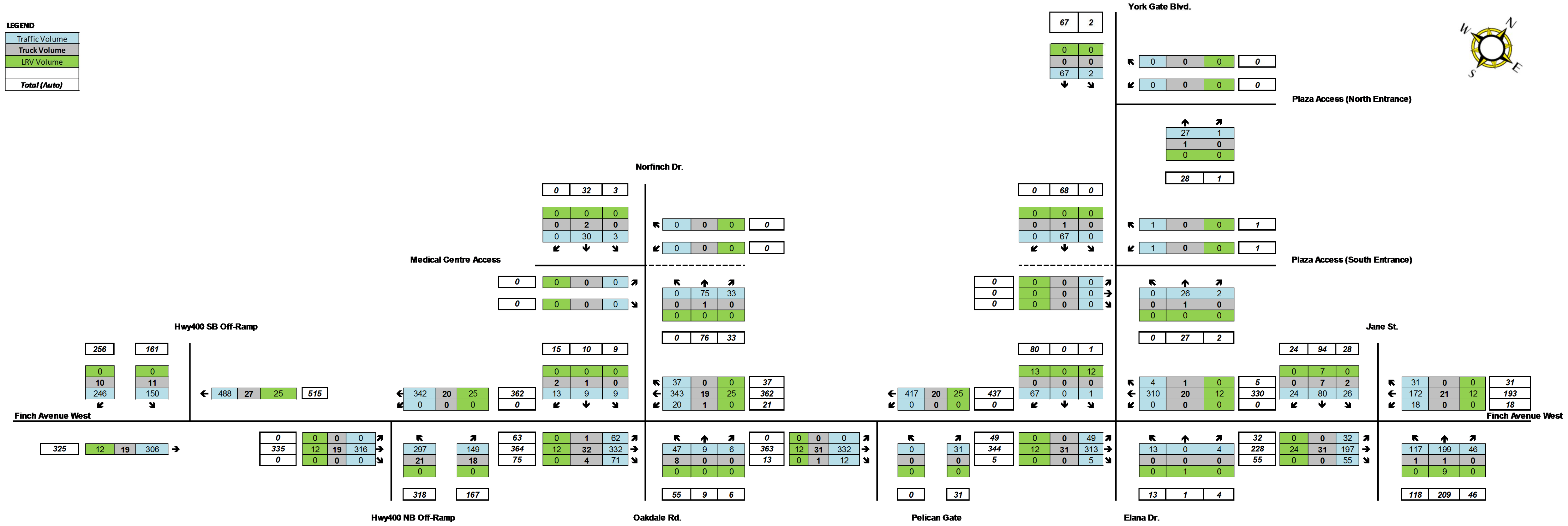


Figure 12: Future Total Traffic Volumes during AM Peak Period (Option 1)

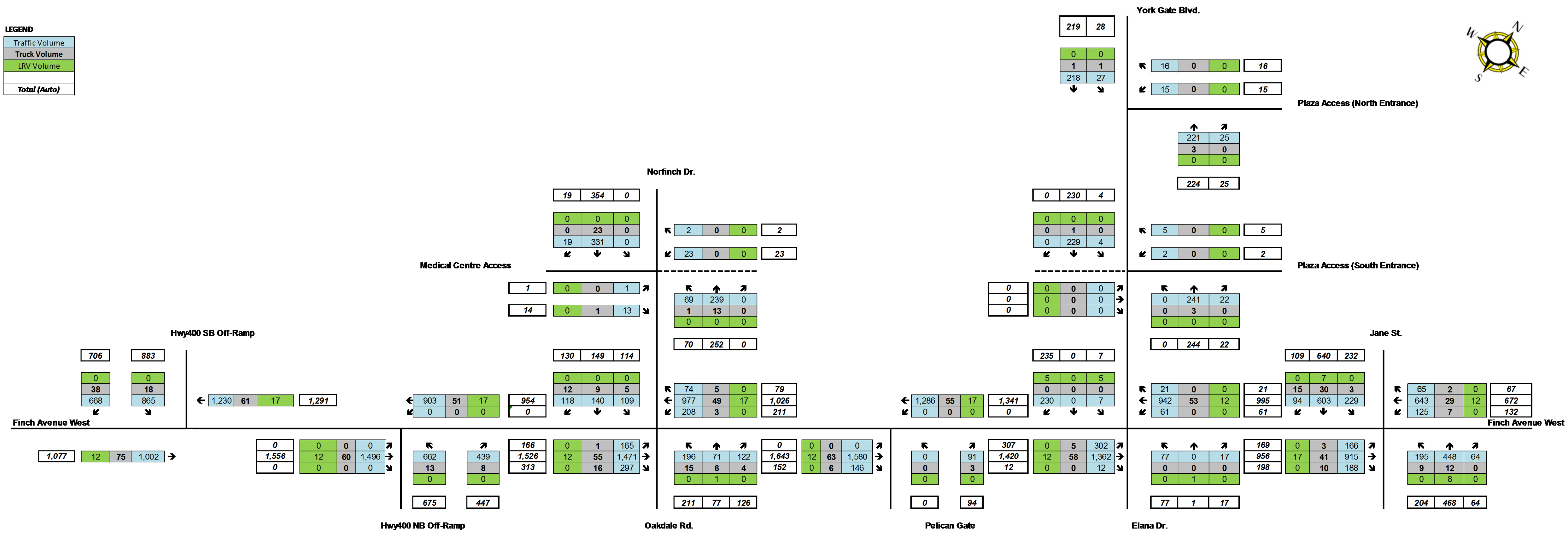


Figure 13: Future Total Traffic Volumes during PM Peak Period (Option 1)

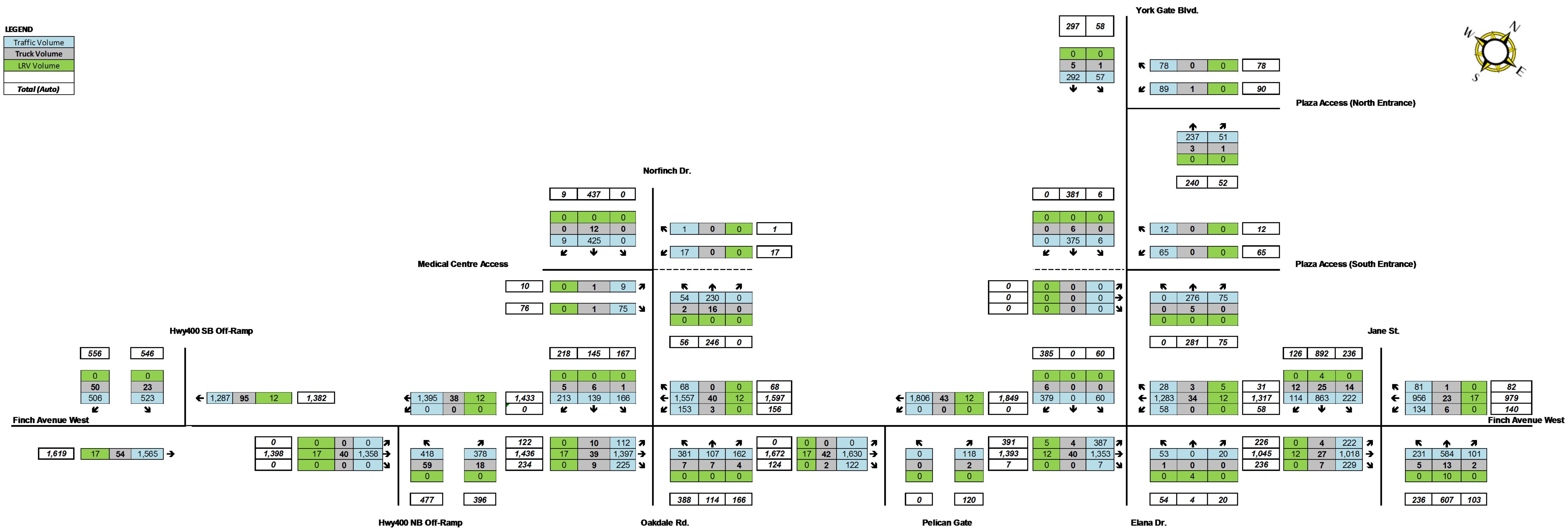


Figure 14: Future Total Traffic Volumes during Early Morning (5:00a.m.-6:00a.m.) Period (Option 2)

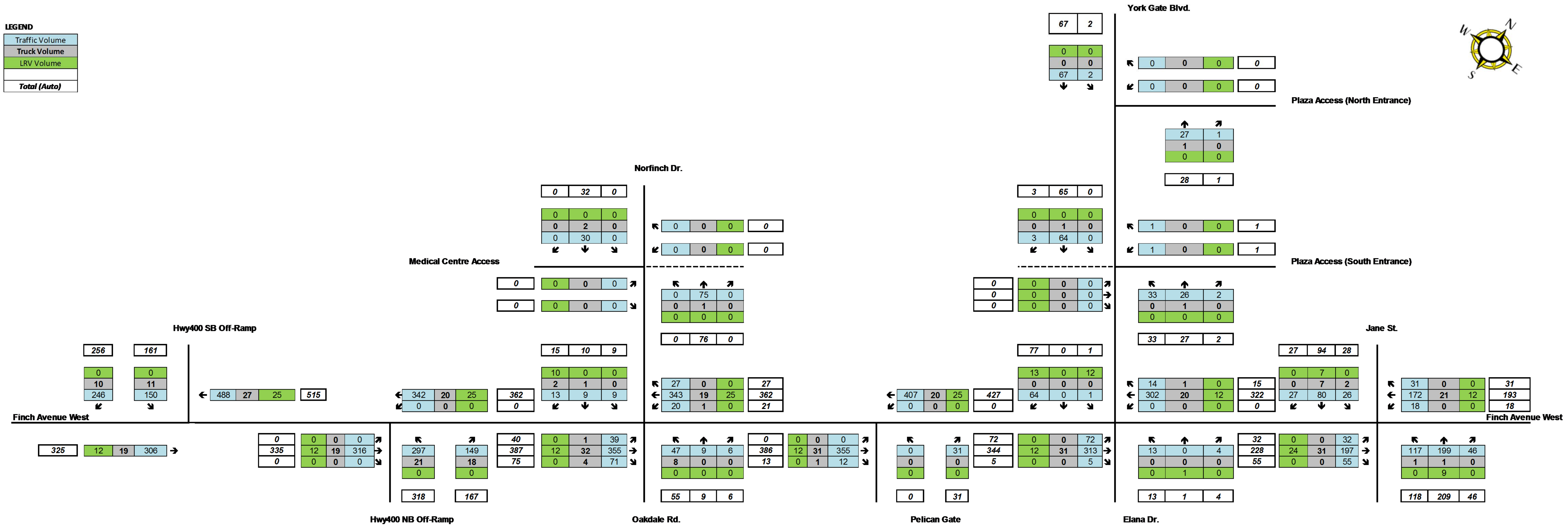


Figure 15: Future Total Traffic Volumes during AM Peak Period (Option 2)

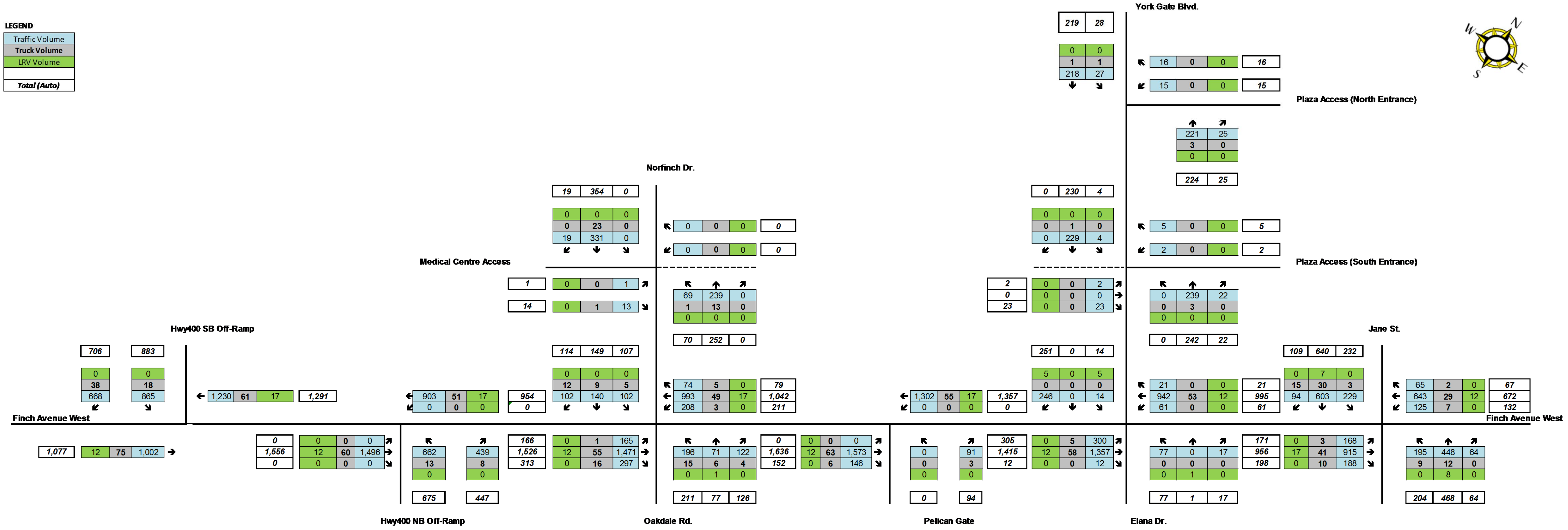


Figure 16: Future Total Traffic Volumes during PM Peak Period (Option 2)

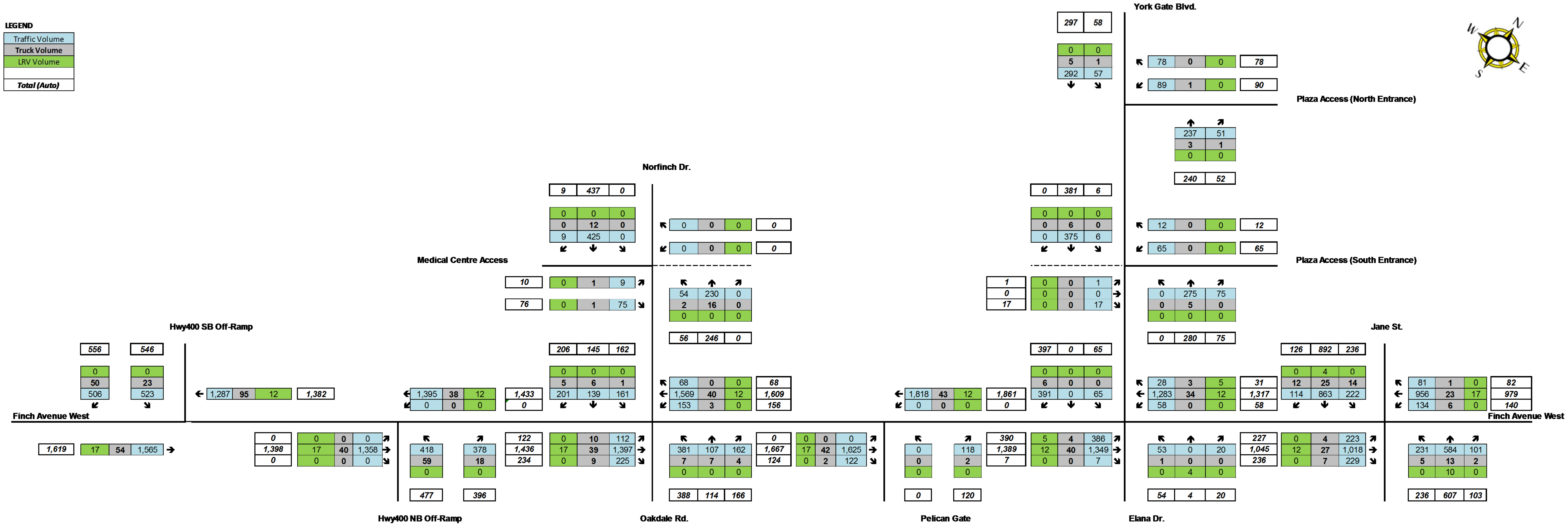


Table 1: AM Peak Hour Level of Service (During Construction_100% Traffic) at Signalized Intersections

Intersection	Weekday AM Peak Hour						
	Average Delay (s)	Overall LOS	Critical Movement (V/C ≥0.85)	V/C	Delay (s)	LOS	95th Queue Length (m)
Finch Ave. W./ Highway 400 SB Off Ramp	18.8	B	-	-	-	-	-
Finch Ave. W./ Highway 400 NB Off Ramp	15.7	B	-	-	-	-	-
Finch Ave. W./ Oakdale Rd./ Norfinch Dr.	119.9	F	EBTR WBL NBL	1.36 0.97 1.00	206.1 100.0 114.5	F F F	176 67 51
Finch Ave. W./ Elana Dr./ York Gate Blvd.	27.7	C	-	-	-	-	-
Finch Ave. W./ Jane St.	51.4	D	EBTR WBL NBL	0.96 0.94 1.08	51.1 108.3 116.1	D F F	139 71 71

Table 2: PM Peak Hour Level of Service (During Construction_100% Traffic) at Signalized Intersections

Intersection	Weekday PM Peak Hour						
	Average Delay (s)	Overall LOS	Critical Movement (V/C ≥0.85)	V/C	Delay (s)	LOS	95th Queue Length (m)
Finch Ave. W./ Highway 400 SB Off Ramp	15.5	B	-	-	-	-	-
Finch Ave. W./ Highway 400 NB Off Ramp	12.3	B	-	-	-	-	-
Finch Ave. W./ Oakdale Rd./ Norfinch Dr.	105.7	F	EBTR WBTR NBL	1.13 1.14 1.31	107.6 109.3 211.6	F F F	173 140 49
Finch Ave. W./ Elana Dr./ York Gate Blvd.	36.8	D	WBTR	0.86	40.7	D	251
Finch Ave. W./ Jane St.	62.8	E	EBL EBTR WBL WBTR NBL SBL SBT	0.92 1.05 0.95 0.91 1.18 0.97 0.92	92.4 75.8 107.7 48.3 151.5 77.8 51.9	F E F D F E D	69 185 71 385 63 70 213

Table 3: AM Peak Hour Level of Service (During Construction with 25% Traffic Diversion) at Signalized Intersections

Intersection	Weekday AM Peak Hour						
	Average Delay (s)	Overall LOS	Critical Movement (V/C ≥0.85)	V/C	Delay (s)	LOS	95th Queue Length (m)
Finch Ave. W./ Highway 400 SB Off Ramp	15.1	B	-	-	-	-	-
Finch Ave. W./ Highway 400 NB Off Ramp	11.0	B	-	-	-	-	-
Finch Ave. W./ Oakdale	47.3	D	EBTR	0.96	51.4	D	257

Rd./ Norfinch Dr.							
Finch Ave. W./ Elana Dr./ York Gate Blvd.	20.8	C	-	-	-	-	-
Finch Ave. W./ Jane St.	34.2	C	-	-	-	-	-

Table 4: AM Peak Hour Level of Service (During Construction with 25% Traffic Diversion) at Signalized Intersections

Intersection	Weekday PM Peak Hour						
	Average Delay (s)	Overall LOS	Critical Movement (V/C ≥0.85)	V/C	Delay (s)	LOS	95th Queue Length (m)
Finch Ave. W./ Highway 400 SB Off Ramp	11.8	B	-	-	-	-	-
Finch Ave. W./ Highway 400 NB Off Ramp	8.9	A	-	-	-	-	-
Finch Ave. W./ Oakdale Rd./ Norfinch Dr.	41.8	D	NBL	0.90	68.3	E	50
Finch Ave. W./ Elana Dr./ York Gate Blvd.	24.9	C	-	-	-	-	-
Finch Ave. W./ Jane St.	35.8	D	-	-	-	-	-

Table 5: Future Background AM Peak Hour Level of Service

At Signalized Intersections:

Intersection	Weekday AM Peak Hour						
	Average Delay (s)	Overall LOS	Critical Movement (V/C ≥0.85)	V/C	Delay (s)	LOS	95th Queue Length (m)
Finch Ave. W./ Highway 400 SB Off Ramp	23.3	C	-	-	-	-	-
Finch Ave. W./ Highway 400 NB Off Ramp	15.0	B	-	-	-	-	-
Finch Ave. W./ Oakdale Rd./ Norfinch Dr.	58.5	E	EBTR NBL	1.03 1.00	70.1 114.5	E F	390 51
Finch Ave. W./ Elana Dr./ York Gate Blvd.	24.5	C	-	-	-	-	-
Finch Ave. W./ Jane St.	39.5	D	EBT NBL	0.86 0.95	41.6 70.9	D E	179 64

At Unsignalized Intersections:

Intersection	Weekday AM Peak Hour						
	Average Delay (s)	ICU LOS	Conflicting Movements	V/C	Delay (s)	LOS	95th Queue Length (m)
Finch Ave. W./ Pelican Gate	0.5	A	NBR	0.23	12.7	B	67
York Gate Blvd./ South Plaza Access	0.3	A	WBL SBT	0.02 0.01	10.2 0.5	B A	9 2
York Gate Blvd. / North Plaza Access	1.5	A	WBL SBT	0.08 0.05	11.8 3.3	B A	13 8
Norfinch Dr. / Medical Centre Access	1.7	A	WBT NBL	0.11 0.06	5.3 11.1	A B	15 11

Table 6: Future Background PM Peak Hour Level of Service

At Signalized Intersections:

Intersection	Weekday PM Peak Hour						
	Average Delay (s)	Overall LOS	Critical Movement (V/C ≥0.85)	V/C	Delay (s)	LOS	95th Queue Length (m)
Finch Ave. W./ Highway 400 SB Off Ramp	19.1	B	-	-	-	-	-
Finch Ave. W./ Highway 400 NB Off Ramp	13.2	B	-	-	-	-	-
Finch Ave. W./ Oakdale Rd./ Norfinch Dr.	53.4	D	EBTR WBTR NBL	0.90 0.91 1.16	44.2 43.5 140.3	D D F	471 148 51
Finch Ave. W./ Elana Dr./ York Gate Blvd.	31.4	C	-	-	-	-	-
Finch Ave. W./ Jane St.	49.2	D	EBL EBT WBL WBT NBL SBL SBT	0.92 0.88 0.95 0.88 0.99 0.85 0.92	92.4 45.6 107.7 47.5 86.4 46.0 51.9	F D F D F D D	79 170 71 393 70 69 203

At Unsignalized Intersections:

Intersection	Weekday PM Peak Hour						
	Average Delay (s)	ICU LOS	Conflicting Movements	V/C	Delay (s)	LOS	95th Queue Length (m)
Finch Ave. W./ Pelican Gate	0.4	A	NBR	0.21	11.5	B	99
York Gate Blvd./ South Plaza Access	2.2	A	WBL SBT	0.28 0.01	16.1 0.7	C A	55 88
York Gate Blvd. / North Plaza Access	4.3	A	WBL SBT	0.40 0.06	16.9 3.6	C A	37 15
Norfinch Dr. / Medical Centre Access	2.3	A	WBT NBL	0.08 0.22	4.6 13.9	A B	14 16

Table 7: Future Background Early Morning Period (5:00-6:00a.m.) Level of Service

At Signalized Intersections:

Intersection	Weekday Early Morning (5-6:00AM) Period						
	Average Delay (s)	Overall LOS	Critical Movement (V/C ≥0.85)	V/C	Delay (s)	LOS	95th Queue Length (m)
Finch Ave. W./ Highway 400 SB Off Ramp	17.2	B	-	-	-	-	-
Finch Ave. W./ Highway 400 NB Off Ramp	14.4	B	-	-	-	-	-

Finch Ave. W./ Oakdale Rd./ Norfinch Dr.	17.8	B	-	-	-	-	-
Finch Ave. W./ Elana Dr./ York Gate Blvd.	13.0	B	-	-	-	-	-
Finch Ave. W./ Jane St.	28.2	C	-	-	-	-	-

At Unsignalized Intersections:

Intersection	Weekday Early Morning (5-6:00AM) Period						
	Average Delay (s)	ICU LOS	Conflicting Movements	V/C	Delay (s)	LOS	95th Queue Length (m)
Finch Ave. W./ Pelican Gate	0.5	A	-	-	-	-	-
York Gate Blvd./ South Plaza Access	0.3	A	-	-	-	-	-
York Gate Blvd. / North Plaza Access	0.3	A	-	-	-	-	-
Norfinch Dr. / Medical Centre Access	0.0	A	-	-	-	-	-

Table 8: Future Total Early Morning Period (5:00-6:00a.m.) Level of Service (Option 1)

At Signalized Intersections:

Intersection	Weekday AM Peak Hour						
	Average Delay (s)	Overall LOS	Critical Movement (V/C ≥0.85)	V/C	Delay (s)	LOS	95th Queue Length (m)
Finch Ave. W./ Highway 400 SB Off Ramp	15.8	B	-	-	-	-	-
Finch Ave. W./ Highway 400 NB Off Ramp	12.1	B	-	-	-	-	-
Finch Ave. W./ Oakdale Rd./ Norfinch Dr.	19.4	B	-	-	-	-	-
Finch Ave. W./ Elana Dr./ York Gate Blvd.	13.5	B	-	-	-	-	-
Finch Ave. W./ Jane St.	28.2	C	-	-	-	-	-

At Unsignalized Intersections:

Intersection	Weekday AM Peak Hour						
	Average Delay (s)	ICU LOS	Conflicting Movements	V/C	Delay (s)	LOS	95th Queue Length (m)
Finch Ave. W./ Pelican Gate	0.5	A	NBR	0.07	10.5	B	14
York Gate Blvd./ South Plaza Access	0.3	A	WBLR	0.00	8.7	A	4
York Gate Blvd. / North Plaza Access	0.2	A	WBLR SBTL	0.00 0.00	0.0 0.9	A A	0 0
Norfinch Dr. / Medical Centre Access	0.2	A	EBTL NBLTR SBL SBTR	0.00 0.00 0.00 0.00	1.1 0.0 0.0 0.0	A A A A	1 0 0 0

Table 9: Future Total Early Morning Period (5:00-6:00a.m.) Level of Service (Option 2)

At Signalized Intersections:

Intersection	Weekday AM Peak Hour						
	Average Delay (s)	Overall LOS	Critical Movement (V/C ≥0.85)	V/C	Delay (s)	LOS	95th Queue Length (m)
Finch Ave. W./ Highway 400 SB Off Ramp	15.8	B	-	-	-	-	-
Finch Ave. W./ Highway 400 NB Off Ramp	12.8	B	-	-	-	-	-
Finch Ave. W./ Oakdale Rd./ Norfinch Dr.	16.8	B	-	-	-	-	-
Finch Ave. W./ Elana Dr./ York Gate Blvd.	14.5	B	-	-	-	-	-
Finch Ave. W./ Jane St.	28.2	C	-	-	-	-	-

At Unsignalized Intersections:

Intersection	Weekday AM Peak Hour						
	Average Delay (s)	ICU LOS	Conflicting Movements	V/C	Delay (s)	LOS	95th Queue Length (m)
Finch Ave. W./ Pelican Gate	0.5	A	NBR	0.07	10.5	B	14
York Gate Blvd./ South Plaza Access	1.9	A	EBL EBR WBLTR NBTL	0.00 0.00 0.01 0.02	0.0 0.0 9.0 5.1	A A A A	0 0 4 5
York Gate Blvd. / North Plaza Access	0.2	A	WBLR SBTL	0.00 0.00	0.0 0.9	A A	0 0
Norfinch Dr. / Medical Centre Access	0.0	A	NBLR	0.00	0.0	A	0

Table 10: Future Total AM Peak Hour Level of Service (Option 1)

At Signalized Intersections:

Intersection	Weekday AM Peak Hour						
	Average Delay (s)	Overall LOS	Critical Movement (V/C ≥0.85)	V/C	Delay (s)	LOS	95th Queue Length (m)
Finch Ave. W./ Highway 400 SB Off Ramp	23.8	C	-	-	-	-	-
Finch Ave. W./ Highway 400 NB Off Ramp	15.5	B	-	-	-	-	-
Finch Ave. W./ Oakdale Rd./ Norfinch Dr.	70.3	E	EBTR NBL	1.13 0.92	107.5 82.7	F F	401 50
Finch Ave. W./ Elana Dr./ York Gate Blvd.	27.3	C	-	-	-	-	-
Finch Ave. W./ Jane St.	39.5	D	EBT NBL	0.87 0.95	41.8 70.9	D E	286 61

At Unsignalized Intersections:

Intersection	Weekday AM Peak Hour						
	Average Delay (s)	ICU LOS	Conflicting Movements	V/C	Delay (s)	LOS	95th Queue Length (m)
Finch Ave. W./ Pelican Gate	0.5	A	NBR	0.22	12.2	B	32
York Gate Blvd./ South Plaza Access	0.3	A	WBLR SBTL	0.02 0.01	10.2 0.5	B A	8 2
York Gate Blvd. / North Plaza Access	1.5	A	WBLR SBTL	0.08 0.05	11.9 3.3	B A	12 9
Norfinch Dr. / Medical Centre Access	2.3	A	WBTL NBLTR SBL SBTR	0.11 0.06 0.10 0.00	4.6 11.3 20.6 9.1	A B C A	14 12 12 4

Table 11: Future Total PM Peak Hour Level of Service (Option 1)

At Signalized Intersections:

Intersection	Weekday PM Peak Hour						
	Average Delay (s)	Overall LOS	Critical Movement (V/C ≥0.85)	V/C	Delay (s)	LOS	95th Queue Length (m)
Finch Ave. W./ Highway 400 SB Off Ramp	19.1	B	-	-	-	-	-
Finch Ave. W./ Highway 400 NB Off Ramp	13.2	B	-	-	-	-	-
Finch Ave. W./ Oakdale Rd./ Norfinch Dr.	49.9	D	EBTR WBTR NBL	0.90 0.93 0.98	44.5 47.5 76.7	D D E	424 160 47
Finch Ave. W./ Elana Dr./ York Gate Blvd.	29.8	C	-	-	-	-	-
Finch Ave. W./ Jane St.	51.9	D	EBL EBT WBT NBL SBL SBT	0.97 0.89 0.91 1.07 0.88 0.92	99.3 46.6 52.4 112.0 51.2 51.9	F D D F D D	99 189 391 65 69 199

At Unsignalized Intersections:

Intersection	Weekday PM Peak Hour						
	Average Delay (s)	ICU LOS	Conflicting Movements	V/C	Delay (s)	LOS	95th Queue Length (m)
Finch Ave. W./ Pelican Gate	0.4	A	NBR	0.21	11.5	B	53
York Gate Blvd./ South Plaza Access	2.2	A	WBLR SBTL	0.28 0.01	16.2 0.7	C A	64 126
York Gate Blvd. / North Plaza Access	4.3	A	WBLR SBTL	0.40 0.06	16.9 3.6	C A	77 85
Norfinch Dr. / Medical Centre Access	2.8	A	WBTL NBLTR SBL SBTR	0.08 0.24 0.09 0.00	3.8 14.7 23.5 9.1	A B C A	15 18 11 4

Table 12: Future Total AM Peak Hour Level of Service (Option 2)

At Signalized Intersections:

Intersection	Weekday AM Peak Hour						
	Average Delay (s)	Overall LOS	Critical Movement (V/C ≥0.85)	V/C	Delay (s)	LOS	95th Queue Length (m)
Finch Ave. W./ Highway 400 SB Off Ramp	23.8	C	-	-	-	-	-
Finch Ave. W./ Highway 400 NB Off Ramp	15.5	B	-	-	-	-	-
Finch Ave. W./ Oakdale Rd./ Norfinch Dr.	56.5	E	EBTR NBL	1.05 0.92	72.5 82.7	E F	406 50
Finch Ave. W./ Elana Dr./ York Gate Blvd.	27.5	C	-	-	-	-	-
Finch Ave. W./ Jane St.	39.5	D	EBT NBL	0.87 0.95	41.8 70.9	D E	275 69

At Unsignalized Intersections:

Intersection	Weekday AM Peak Hour						
	Average Delay (s)	ICU LOS	Conflicting Movements	V/C	Delay (s)	LOS	95th Queue Length (m)
Finch Ave. W./ Pelican Gate	0.5	A	NBR	0.23	12.5	B	67
York Gate Blvd./ South Plaza Access	0.7	A	EBL EBR WBLTR SBTL	0.00 0.03 0.02 0.01	12.9 9.3 10.6 0.4	B A B A	4 13 8 2
York Gate Blvd. / North Plaza Access	1.5	A	WBLR SBTL	0.08 0.05	11.9 3.3	B A	13 9
Norfinch Dr. / Medical Centre Access	1.7	A	WBTL NBLR	0.11 0.06	5.3 11.1	A B	14 12

Table 13: Future Total PM Peak Hour Level of Service (Option 2)

At Signalized Intersections:

Intersection	Weekday PM Peak Hour						
	Average Delay (s)	Overall LOS	Critical Movement (V/C ≥0.85)	V/C	Delay (s)	LOS	95th Queue Length (m)
Finch Ave. W./ Highway 400 SB Off Ramp	19.1	B	-	-	-	-	-
Finch Ave. W./ Highway 400 NB Off Ramp	13.2	B	-	-	-	-	-
Finch Ave. W./ Oakdale Rd./ Norfinch Dr.	49.9	D	EBTR WBTR NBL	0.90 0.94 0.97	44.5 48.3 72.4	D D E	441 154 47
Finch Ave. W./ Elana Dr./ York Gate Blvd.	30.2	C	-	-	-	-	-
Finch Ave. W./ Jane St.	51.9	D	EBL EBT WBT	0.98 0.89 0.91	100.2 46.6 52.4	F D D	102 170 383

			NBL SBL SBT	1.07 0.88 0.92	112.0 51.2 51.9	F D D	58 69 187

At Unsignalized Intersections:

Intersection	Weekday PM Peak Hour						
	Average Delay (s)	ICU LOS	Conflicting Movements	V/C	Delay (s)	LOS	95th Queue Length (m)
Finch Ave. W./ Pelican Gate	0.4	A	NBR	0.21	11.5	B	37
York Gate Blvd./ South Plaza Access	2.7	A	EBL EBTR WBLTR SBTL	0.00 0.02 0.34 0.01	16.1 9.7 19.1 0.5	C A C A	2 31 59 117
York Gate Blvd. / North Plaza Access	4.3	A	WBLR SBTL	0.40 0.06	16.9 3.6	C A	79 91
Norfinch Dr. / Medical Centre Access	2.3	A	WBTL NBLR	0.08 0.22	4.6 13.9	A B	12 17

Appendix H

Site Layout Selection Process

AECOM

Memorandum

To	Les MacDermid	Page	1
CC	James Jarrett		
Subject	Site Layout Selection Process		
From	David Brutto and Faranak Amirsalari		
Date	July 14, 2015 (Revised)	Project Number	60318592

The following provides a detailed description of the site layout selection process for the proposed Finch West Maintenance and Storage Facility (MSF).

Four possible alternative designs (site layouts) for the MSF were developed during the Preliminary Planning activities for the Project. The four different site layouts were subsequently compared and evaluated with respect to the following environmental components:

- Natural Environment
  - Terrestrial Natural Heritage
  - Surface Water and Aquatic
  - Geology and Groundwater
- Cultural Environment
  - Archaeology
  - Cultural Heritage
- Socio-Economic Environment
  - Land Use
  - Visual Character
  - Community Features
  - Noise and Vibration
  - Air Quality
- Traffic and Transportation

A recommended site layout was selected based on the results from the site layout selection process. The recommended site layout was further refined based on additional design specifications to arrive at the preferred design for the Finch West MSF.

1. Design Assumptions

The following provides a description of assumptions applied with respect to applicable environmental factors as part of the assessment of potential effects of the alternative site layouts. These assumptions are further carried into the impact assessment of the recommended site layout, and elaborated upon, where required, in Section 4 of the Finch West MSF Environmental Project Report (EPR).

1.1 Noise and Vibration

Noise and vibration sensitive areas are located on three different (north, west and south) sides of the facility with varying setbacks and background noise conditions. Noise from the MSF is also expected to be non-uniform in distribution and projection characteristics. As such, the impacts for one noise sensitive area will be different from the other noise sensitive areas; therefore, each noise sensitive area will be assessed with its own “high impact” scenario.

Construction noise was assessed using typical construction stages and equipment. The assessment was conducted with equipment concentrated in the high impact area for each noise sensitive area. **Table 1** provides a description and sample quantity of construction equipment assumed near each noise sensitive area (does not account for the whole site). Construction vibration will be assessed with construction equipment located at their respective high impact locations of operation, including connections to the mainline.

Operational vibration assessment was conducted under the same conditions of the construction vibration assessment, using only equipment expected on-site during the operations of the MSF. The high impact scenario for one noise sensitive area was not assumed the same as the high impact scenario for another noise sensitive area. As such, the various MSF configurations were reviewed (see alternative site layouts in **Section 2**) for the highest impact scenario for each noise sensitive area.

Table 1: Anticipated Construction Activities and Assumed Equipment Amounts

Equipment Description	Amounts Associated with Construction Activities (Equipment)						
	Site Preparation and Utility Relocation Equipment	Excavation and Grading Equipment	Building Construction Equipment	Track Installation Equipment	Piled Foundation Construction Options/Equipment		
					Impact/Hammer	Vibratory/Sonic	Drilled
Excavator	1	2	1	1	-	-	-
Backhoe	2	2	-	-	-	-	-
Bulldozer	1	1	-	-	-	-	-
Grader	1	1	-	-	-	-	-
Skid Steers	2	2	2	2	1	1	1
Compaction Machine	1	1	-	-	-	-	-
Crane - Mobile	1	-	2	2	1	1	1
Ballast Regulator	-	-	-	1	-	-	-
Tamper Machine	-	-	-	1	-	-	-
Semi-Trucks/hr	2	2	2	2	2	2	1
Concrete Pump Truck	-	1	2	-	-	-	1
Cement Trucks/hr	-	2	4	-	-	-	2
Dump Trucks/hr	4	2	-	-	-	-	1
Generator	1	1	1	1	1	1	1
Vibratory	-	-	-	1	-	-	-

Equipment Description	Amounts Associated with Construction Activities (Equipment)						
	Site Preparation and Utility Relocation Equipment	Excavation and Grading Equipment	Building Construction Equipment	Track Installation Equipment	Piled Foundation Construction Options/Equipment		
					Impact/Hammer	Vibratory/Sonic	Drilled
Roller							
Impact Pile	-	-	-	-	1	-	-
Sonic or Vibratory Piler	-	-	-	-	-	1	-
Drill Rig	-	-	-	-	-	-	1

1.2 Air Quality

Potential sources of air emissions during the construction and operation phases were identified. The study area to assess the impact from the operations phase extended to 1 km from the property line and the maximum emission scenario assumed 24 hours per day, 7 days per week operations with the simultaneous operation of all anticipated equipment and processes which release air emissions.

Modelling results from the operational stage of the MSF were combined with 90th percentile background pollutant concentrations as measured by the MOECC and Environment Canada air quality monitoring stations nearest to the site over a five (5) year period (2007-2011). The combined results were compared to Provincial ambient air quality standards under *Ontario Regulation 419/05*, ambient air quality criteria, guidelines and Federal guidelines, where available.

Design assumptions utilized in the air quality assessment for the construction and operation phases are identified in the Air Quality Assessment Report.

1.2.1 Facility Emission Calculations

Anticipated equipment and processes which release air emissions were identified in the operations phase based on a similar type of facility. The sizing and operation assumptions provided the framework to determine the air emission rates and the type of contaminants emitted from the MSF. Further details on the type of equipment and operating assumptions are provided in the Air Quality Assessment Report.

1.3 Transportation and Traffic

There will be approximately 350 employees at the facility working in three shifts with the majority of workers (approximately 200) on the day shift. The shift times will be at various times throughout the day (assumptions shown in **Table 2**), with corresponding end times approximately eight hours later.

The transit access points for LRVs to and from the MSF will be slightly north of the York Gate Boulevard and Finch Avenue West intersection. This entrance would be coordinated with the adjacent traffic signals on Finch Avenue West to ensure safe and efficient movements. LRV circulation internal to the site will operate to accommodate LRV movements in a manner which will allow for proper manoeuvring of vehicles into the Main Repair Shop Facility and Operations Company building. Norfinch Drive will not be used for LRV access/egress due to geometry and grade issues.

Automobiles and truck traffic related to the operations within the buildings will generally enter via a driveway on Norfinch Drive or York Gate Boulevard. A secondary vehicular entrance is feasible from York Gate Boulevard. The electrical substation and Maintenance of Way buildings are expected to represent a minority of the automobile and truck traffic generated.

The majority of the LRVs will be put into service early in the morning (between 4:30 AM – 8:00 AM), a smaller number will return or depart during the day as related to peak and off peak service, and higher numbers will return during the evening after midnight as the service terminates.

To assess potential effects on traffic, three future scenarios will be evaluated and analyzed using the Synchro / SimTraffic software package, which implements the methods of the 2000 Highway Capacity Manual. The scenarios include traffic assessment during construction, future background and future total traffic conditions.

The assumptions and methodology in this analysis are based on the *Etobicoke – Finch West LRT Transit Project Assessment Study, Appendix C* (TTC, 2010) that designated a “high impact” traffic analysis and considered the roadway to be nearing capacity. The assumptions included in the traffic analysis are as follows:

- The base peak hour traffic volumes in the future remain the same, minus Finch West Route 36 buses. Additional traffic generated by new, large, approved developments (at the time of the analysis) has been added (per the EPR).
- Bus route 36D, is assumed to continue operating with the same headway as the existing schedule.
- Traffic previously executing left-turn movements into or out of driveways and unsignalized intersections is rerouted to adjacent signalized intersections as U-turn movements.
- LRVs will proceed with the through movement of general traffic on Finch Avenue.
- All vehicles turning left and U-turning from Finch Avenue West will only proceed with a “protected” green arrow traffic signal phase, to ensure the movements do not conflict with LRV flow.
- Pedestrian crossing timings (mainly in the north/south direction) are in conformance with City of Toronto standards.
- Vehicular traffic signal phases have been optimized to achieve the most efficient balance of the remaining green time during peak hour traffic signal cycles.

The assumptions for MSF staff arrival and departure times (during operation of the facility), are shown in **Table 2**.

Table 2: Assumptions for MSF Operating Staff Arrival and Departures

Maintenance Staff Shift 1	**Arrivals**	**Departures**
	6:30 AM – 7:00 AM	3:00 PM – 4:00 PM
	60	60
Maintenance Staff Shift 2	**Arrivals**	**Departures**
	2:30 PM – 3:00 PM	11:00 PM – 12:00 AM
	60	60
Maintenance Staff Shift 3	**Arrivals**	**Departures**
	10:30 PM – 11:00 PM	7:00 AM – 8:00 AM
	50	50
Driver Staff Shift 1	**Arrivals**	**Departures**
	4:00 AM – 4:30 AM	12:00 PM – 1:00 PM
	36	36
Driver Staff Shift (Additional Shift in AM Peak hour)	**Arrivals**	**Departures**
	5:00 AM – 5:30 AM	1:00 PM – 2:00 PM
	36	36
Driver Staff Shift 2	**Arrivals**	**Departures**
	11:30 AM – 12:00 PM	8:00 PM – 9:00 PM
	36	36
Driver Staff Shift (Additional Shift in PM Peak hour)	**Arrivals**	**Departures**
	3:00 PM – 3:30 PM	6:00 PM – 7:00 PM
	36	36
Driver Staff Shift 3	**Arrivals**	**Departures**
	7:30 PM – 8:00 PM	1:00 AM – 2:00 AM
	36	36
Total	**350**	**350**

The assumed LRV volumes and arrival and departure times (during operation of the facility) are shown in **Table 3**.

Table 3: Time Period LRV Volume Assumptions

Time of the Day	Period	Number of Trains
Early Morning	4:30 AM – 8:00 AM	65
AM Peak	8:00 AM – 9:00 AM	10
PM Peak	5:00 PM – 6:00 PM	10
Evening	After 6 PM	65

The assumed MSF trip generation for the high impact scenario during the specified analysis period is shown in **Table 4**. Assumptions on staff arrival/departure were developed and applied to the analysis peak hours.

Table 4: High Impact Scenario for each Analysis Period

Analysis Period	Key Descriptor
5:00 AM – 6:00 AM	Early morning LRV departure (25 LRVs) + Employee Vehicle Trips (36 trips)
8:00 AM – 9:00 AM	LRV departure (10 LRVs) + Employee Trips (25 trips)
5:00 PM – 6:00 PM	LRV arrival (10 LRVs) + Employee Vehicle Trips (18 trips)

1.4 Natural Heritage

The Finch West MSF can be located in various configurations on the 8 ha site, however, for natural heritage effects assessment purposes, the assumption is that the entire site will be developed.

1.5 Archaeology and Cultural Heritage

The Finch West MSF can be located in various configurations on the 8 ha site, however, for archaeological and cultural heritage effects assessment purposes, the assumption is that the entire site will be developed.

1.6 Land Use and Visual

The Finch West MSF can be located in various configurations on the 8 ha site, however, for land use and visual effects assessment purposes, the assumption is that the entire site will be developed.

2. MSF Alternative Site Layouts

Alternative site layouts for the MSF were developed. An evaluation of the alternative site layouts was carried out to identify any potentially significant environmental effects that would result from each layout. The potential effects of the alternative site layouts were evaluated to select a recommended site layout.

2.1 Description of the Alternative Site Layouts

To develop alternative site layouts for the MSF site, the main elements of the MSF were grouped based on typical layout features for a LRV MSF. These groupings differ from functional engineering design layouts (e.g., Reference Concept Design (RCD)) in that they are used solely for the purpose of facilitating an evaluation of potential environmental effects between alternative site layouts.

Examples of typical element groupings for the MSF include; on-site buildings generally being found within close proximity to each other, adjacent to, or nearby employee parking (limits on-site walking distances); and stormwater management (SWM) pond generally found within reasonable proximity to a track storage yard (due to the large impervious surface).

The groupings are provided below:

Group 1: Buildings

- Main Repair Shop Facility
- Maintenance of Way Building
- Operations Company Building
- Electrical Substation.

Group 2: Ancillary Facility Features

- Outdoor Storage Yard
- Stormwater Management Pond
- Employee Parking
- LRV Hand-Over Platform (may also be located between buildings)

Group 3: Major Track Crossovers

- The track crossover areas connect the Main Repair Shop Facility to the LRV Storage Yard, in two main locations within each alternative.

Group 4: LRV Storage Track Area

- Includes the most concentrated area of on-site Overhead Contact System (OCS) features.

Site Access/Egress

Location of access/egress is integral to site functionality. The locations for the transit (e.g. LRVs) and non-transit vehicles are considered the same for each alternative, as follows:

- Site access for non-transit traffic (e.g. employee vehicles) off of Norfinch Drive and/or York Gate Boulevard
- LRVs enter and exit the MSF from a single point located slightly north of the York Gate Boulevard and Finch Avenue West intersection.

The relation of the above groupings on-site is represented by the four alternative site layouts (see **Figures 1 through 4**).

The Finch West MSF alternative site layouts are as follows:

Alternative Site Layout #1

This layout includes **Group 1: Buildings** located in the northern portion of the site, **Group 2: Outdoor Storage Yard** and other ancillary features (e.g. SWM, vehicular parking, etc.) in the middle of the site, **Group 3: Track Crossovers** near the eastern and western site perimeter, and **Group 4: LRV Storage Track Area** on the southern portion of the site.

Alternative Site Layout #2

This layout includes **Group 1: Buildings** located in the eastern portion of the site, **Group 2: Outdoor Storage Yard** and other ancillary features (e.g. SWM, vehicular parking, etc.) in the middle of the site, **Group 3: Track Crossovers** near the northern and southern site perimeter, and **Group 4: LRV Storage Track** area on the western portion of the site.

Alternative Site Layout #3

This design includes **Group 1: Buildings** located in the southern portion of the site, **Group 2: Outdoor Storage Yard** and other ancillary features (e.g. SWM, vehicular parking, etc.) in the middle of the site, **Group 3: Track Crossovers** near the eastern and western site perimeter, and **Group 4: LRV Storage Track** area on the northern portion of the site.

Alternative Site Layout #4

This design includes **Group 1: Buildings** located in the western portion of the site, **Group 2: Outdoor Storage Yard** and other ancillary features (e.g. SWM, vehicular parking, etc.) in the middle of the site, **Group 3: Track Crossovers** near the northern and southern site perimeter, and **Group 4: LRV Storage Track** area on the eastern portion of the site.

Where applicable, the Project Works and Activities associated with the construction phases, described in Section 2.2.2 of the EPR, adopt the maximum values for relevant parameters based on locational prerequisites established by the each alternative site layout. The maximum value for the relevant parameter is incorporated into the evaluation of the potential environmental effects of each alternative site layout, documented in **Section 2.1** to follow.

Legend

🟧	Property Limits for the Proposed MSF Site
H	Hospital / Medical Facilities
⚑	School
■	LRV Entrance/Egress
▨	Non-LRV Entrance/Egress
—	LRV Track
🟦	**Group 1 - Buildings**
▨	Main Repair Shop Facility
▨	Maintenance of Way Building
▨	Operations Company Building
▨	Electrical Substation
🟪	**Group 2 - Ancillary Facility Features**
🟥	**Group 3 - Major Track Crossovers**
🟨	**Group 4 - LRV Storage Track Area**

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Finch West Light Rail
Maintenance and Storage Facility (MSF)
Environmental Assessment

MSF Alternative Site Layout #1

July 2015

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Figure 1

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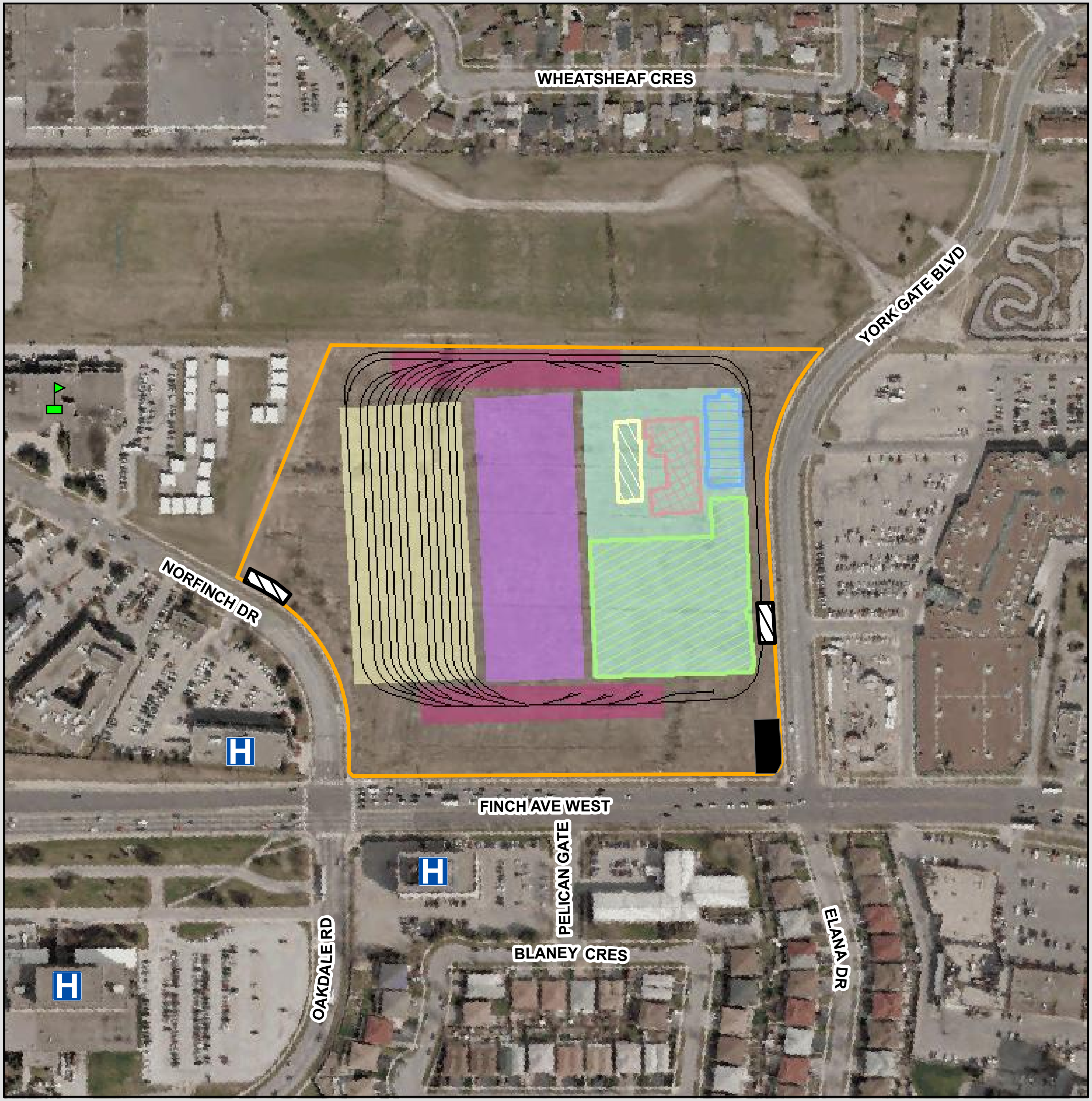

Legend

▭	Property Limits for the Proposed MSF Site
H	Hospital / Medical Facilities
⚑	School
■	LRV Entrance/Egress
▨	Non-LRV Entrance/Egress
—	LRV Track
🟦	**Group 1 - Buildings**
▨	Main Repair Shop Facility
▨	Maintenance of Way Building
▨	Operations Company Building
▨	Electrical Substation
🟪	**Group 2 - Ancillary Facility Features**
🟥	**Group 3 - Major Track Crossovers**
🟨	**Group 4 - LRV Storage Track Area**

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Finch West Light Rail
Maintenance and Storage Facility (MSF)
Environmental Assessment

MSF Alternative Site Layout #2

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Figure 2

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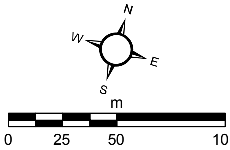
Legend

- ▭ Property Limits for the Proposed MSF Site
- H Hospital / Medical Facilities
- ⚑ School
- ■ LRV Entrance/Egress
- ▨ Non-LRV Entrance/Egress
- — LRV Track
- 🟩 **Group 1 - Buildings**
- ▨ Main Repair Shop Facility
- ▨ Maintenance of Way Building
- ▨ Operations Company Building
- ▨ Electrical Substation
- 🟪 **Group 2 - Ancillary Facility Features**
- 🟥 **Group 3 - Major Track Crossovers**
- 🟨 **Group 4 - LRV Storage Track Area**



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Finch West Light Rail
Maintenance and Storage Facility (MSF)
Environmental Assessment

MSF Alternative Site Layout #3

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Figure 3

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Legend

- Property Limits for the Proposed MSF Site
- Hospital / Medical Facilities
- School
- LRV Entrance/Egress
- Non-LRV Entrance/Egress
- LRV Track
- **Group 1 - Buildings**
- Main Repair Shop Facility
- Maintenance of Way Building
- Operations Company Building
- Electrical Substation
- **Group 2 - Ancillary Facility Features**
- **Group 3 - Major Track Crossovers**
- **Group 4 - LRV Storage Track Area**

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Finch West Light Rail
Maintenance and Storage Facility (MSF)
Environmental Assessment

MSF Alternative Site Layout #4

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Figure 4

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2.2 Comparative Evaluation of the Alternative Site Layouts

The potential environmental effects were identified for each alternative site layout and a comparative evaluation was carried out based on the identified differences in potential environmental effects, in order to arrive at a recommended site layout. The comparative evaluation of the alternative site layouts is included in **Table 5**. The methodology for assessing the potential effects of each discipline below may be found in greater detail in Section 4 of the EPR, where applicable.

2.2.1 Potential Effects on Terrestrial Natural Heritage

The implementation of all alternative site layouts will result in the disturbance of the entire MSF property (8 ha), therefore, the potential effects on terrestrial natural heritage are the same for all alternatives. The analysis of effects on Terrestrial Natural Heritage resultant from the recommended site layout is provided in Section 4.1.1 of the EPR.

2.2.2 Potential Effects on Aquatic and Surface Water

The implementation of all alternative site layouts will result in the disturbance of the entire MSF property (8 ha), therefore, the potential effects on aquatic habitat and surface water are the same for all alternatives. The analysis of effects on Aquatic and Surface Water resultant from the recommended site layout is provided in Section 4.1.2 of the EPR.

2.2.3 Potential Effects on Geology and Groundwater

The implementation of each alternative site layout will result in the disturbance of the entire MSF property (8 ha), including a similar degree of subsurface excavation for each alternative. Therefore, the potential effects on geology and groundwater are the same for all alternatives. The analysis of effects on Geology and Groundwater resultant from the recommended site layout is provided in Section 4.1.3 of the EPR.

2.2.4 Potential Effects on Land Use Designations

Although the MSF is located in various configurations on the 8 ha site for each alternative site layout, the site elements triggering effects on land use designations would be the same, as described in Section 2.2.1 of the EPR. Additionally, the entire site would be developed to accommodate MSF elements.

Alternative Site Layout #3 may provide an opportunity to include an on-site configuration of buildings that has greater regard to the 'Avenues' policy of the Official Plan, specifically with respect to "*improving the pedestrian environment" and "the look of the street"* along Finch Avenue West *(*Toronto Official Plan 2010, Section 2.2.3*).*

The analysis of effects on land use designations resultant from the recommended site layout is provided in Section 4.2.1 of the EPR.

2.2.5 Potential Visual Effects

During construction of the MSF, temporary construction related equipment, machinery and vehicles would be visible from institutions, residences, businesses, and pedestrians in the vicinity of the site. Therefore the visual effect from construction equipment would be similar for all alternatives.

During operation of the MSF, a number of institutions, residences, businesses, and pedestrians in the vicinity of the site will experience a permanent change to their existing views; the existing unobstructed view of a natural (albeit disturbed) grassy field will be replaced with a view of an urbanized, industrial-type facility.

The nature and degree of visual impacts are related to the visibility of MSF components from sensitive visual receptor locations. Visually sensitive receptors are generally present from the east, north, and west viewpoints surrounding the site, however the most sensitive viewpoint from a visual perspective is from the southerly direction. This is due to the Finch Avenue West corridor that currently exhibits a high volume of pedestrian and traffic usage, which will also include the future Finch West LRT and any associated streetscaping/urban renewal elements. Additionally, a retirement residence and two existing homes with side frontage on Finch Avenue West would also have a relatively unobstructed view of the site elements.

The potential visual impacts are generally greatest due to the size, height and inherent aesthetic nature of the elements being introduced on site. With this in mind, the following outlines the MSF elements and their potential for visual impact on sensitive visual receptors (refer to Section 2.2.1 of the EPR for a detailed description of the following):

- Main Repair Shop Building (due to height, size, inherent aesthetic nature)
- Operations Company Building (due to height)
- Maintenance of Way Building (due to height)
- LRV vehicles in storage yard and travelling through access/egress points (due to inherent aesthetic nature);
- Electrical substation (due to height and inherent aesthetic nature)
- Traction Power Distribution System - OCS wiring support structures up to 6 m high (due to height and inherent aesthetic nature).
- Parking lots (due to inherent aesthetic nature).

Screening of site-features in relation to each other and/or sensitive receptors may be used to reduce potential effects. Additionally, since security lighting will be required at the MSF, this will represent a new light source that may have minor potential effects on the surrounding area, including sensitive residential and institutional uses.

In order to allow for ease of movement for LRVs on-site during operation, the site will be reduced to a relatively flat grade, roughly at the same elevation of Finch Avenue West. This will result in a cut at the northern perimeter of the property whereby the site ground elevation will be lower than the adjacent hydro corridor/ recreational field elevation to the north. As a result, MSF elements will be potentially less visible from the northern viewpoints beyond the hydro corridor. MSF elements will be potentially most visible from the eastern, southern, and western viewpoints.

Based on the above, siting of the some of the on-site elements away from Finch Avenue West (e.g. Main Repair Shop, electrical substation, parking), and/or screening the elements with aesthetically friendly mitigation measures (e.g. landscaping, fencing) or other urban-type on-site elements (e.g. Operations Company Building, Maintenance of Way Building) should be strongly considered during the selection of a recommended site layout.

Alternative Site Layout #3 provides the greatest opportunity to incorporate the above mitigation measures.

2.2.6 Potential Effects on Community Features

The potential effects on community features would be based on the findings of the effects assessment of the recommended site layout for other environmental factors including Visual and Land Use, Traffic, Noise, and Vibration, and Air Quality. A preliminary listing of the potential effects of the Project on Community Features includes:

- Changes to living conditions in the community due to project implementation.
- Nuisance effects during construction and operation such as noise, dust, odour and traffic.
- Loss of recreational land or disruption to recreational spaces is not anticipated.
- Temporary changes in traffic flow or access or egress routes affecting businesses during construction.
- Positive effects on businesses due to additional workforce in the area during construction and operation.
- Increased levels of noise and vibration during construction and operation of the MSF.
- Change to the character of the community by removing green space and adding additional buildings.
- Facilitation of an increased community presence via an increased workforce.

Potential effects listed above are considered common to each alternative site layout. The refined analysis of effects on Community Features resultant from the preferred site layout is provided in Section 4.2.3 of the EPR.

2.2.7 Potential Noise Effects

2.2.7.1 Noise Criteria

The primary metric for measuring potential noise impact (effect) is the change in noise level above existing sound levels. **The perceived** impact of changes in sound level is measured in decibels (dB), and the significance of the noise impact is measured by by noise level difference. Refer to Section 4.2.4.1 of the EPR for a description of noise criteria used in the analysis of potential effects.

2.2.7.2 Construction Noise Assessment - Evaluation of the Alternative Site Layouts

Potential construction noise effects would be the same for all alternatives. The sound quality from the construction of this project is expected to be typical of construction activities at other civil engineering projects.

The refined analysis of construction noise effects resultant from the recommended site layout is provided in Section 4.2.4.1 of the EPR.

2.2.7.3 Operational Noise Assessment – Evaluation of the Alternative Site Layouts

As with the construction noise assessment, the noise impact was defined as the difference between Project noise levels and the existing background noise levels (refer to Section 4.2.4.1 of the EPR for the significance of the noise impact by noise level difference). For this assessment, the Monsignor Fraser School is considered not noise sensitive during the night time hours (23:00 to 07:00).

The noise from the operation of the MSF is grouped into three main components:

1. Noise associated with the buildings and their operations
    - Interior operations including wheel truing and vehicle washing
    - Exterior ventilation, exhaust fans, HVAC, compressors, emergency diesel generators
2. Noise from the LRVs traversing over rail junctions
3. Noise from general LRV movements

Specific noise source information was sourced from similar facilities and adjusted for project specific conditions. For example, the building ventilation was increased in proportion to the anticipated size of the buildings. Noise sources were input into an environmental noise prediction algorithm (ISO 9613-2 implemented in Cadna/A software package) to predict the noise levels at the maximum noise receiver locations within each noise sensitive area. Building shielding effects were not considered in the analysis of the alternative site layouts. LRV were also modeled as traversing the entire perimeter of the Project site before deployment. Applicable noise quality penalties were applied as per NPC104.

The predicted noise levels were then compared to the background noise levels to determine the perceived noise impacts due to the operations of the MSF for each alternative site layout. Noise levels from the MSF were also compared with operational noise level limits discussed in Section 4.2.4.1 of the EPR.

Note that the perceived noise impact is based upon the difference between project noise levels and the average background noise. The assessment against the operation noise level limit is based on the predicted project related noise levels and the applicable noise level limits.

For Alternative Site Layout #1, it was revealed that the perceived noise impacts would potentially be ‘high’ (twice as loud or greater) at four assessment locations. The results also indicated that the Finch West MSF will be out of compliance with the MOECC noise guidelines at most assessment locations in the absence of mitigation.

For Alternative Site Layout #2, it was revealed that the perceived noise impacts would potentially be ‘high’ (twice as loud or greater) at three assessment locations. The results also indicated that the Finch West MSF will be out of compliance with the MOECC noise guidelines at all assessment locations in the absence of mitigation.

For Alternative Site Layout #3, it was revealed that the perceived noise impacts would potentially be ‘high’ (twice as loud or greater) at five assessment locations. The results also indicated that the Finch West MSF will be out of compliance with the MOECC noise guidelines at all assessment locations in the absence of mitigation.

For Alternative Site Layout #4, it was revealed that the perceived noise impacts would potentially be ‘high’ (twice as loud or greater) at three assessment locations. The results also indicated that the Finch West MSF will be out of compliance with the MOECC noise guidelines at most assessment locations in the absence of mitigation.

Refer to the Noise and Vibration Report, Appendix C of the EPR, for further detail with respect to the operational noise assessment for the alternative site layouts.

A refined analysis of operational noise effects resultant from the preferred site layout is provided in Section 4.2.4.1 of the EPR.

2.2.8 Potential Vibration Effects

2.2.8.1 Vibration Criteria

There are two main concerns during the assessment of vibration effects: building damage, and human comfort. Building damage may occur when there are excessive vibration impacts on a structure. Human comfort is assessed based upon differing levels of response to vibration levels. Refer to Section 4.2.4.4 of the EPR for a detailed description of vibration criteria used in the analysis of potential effects.

2.2.8.2 Construction Vibration Assessment - Evaluation of the Alternative site layouts

Potential construction vibration effects would the same for all alternatives, as outlined below:

- No building damage due to vibration is expected to occur during construction.
- A zone of influence[1] (as per City of Toronto By-law 514) will not encompass buildings not associated with this project.
- Human annoyance effects (see Section 4.2.4.4 of the EPR for detail) due to vibration during construction would be common to each alternative site layout.
- Most of the expected construction equipment operating at the closest potential point of operation will negatively affect highly sensitive equipment located in medical buildings (see Section 4.2.4.4 of the EPR for detail). Further refinement is required.

Refer to the Noise and Vibration Report, Appendix C of the EPR, for further detail to the construction vibration assessment of the alternative site layouts.

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[1] *An area where construction vibration is predicted to be equal to or greater than 5 mm/s) extends beyond the legal boundaries of the construction site and encompasses any buildings on adjacent properties. Refer to Section 4.2.4.4 of the Environmental Project Report for further detail.*

A refined analysis of construction vibration effects resultant from the recommended site layout is provided in Section 4.2.4.4 of the EPR**.**

2.2.8.3 Operational Vibration Assessment – Evaluation of the Alternative Site Layouts

Preliminary operational vibration assessment of the alternative site layouts found that typical vibration control measures would not be sufficient to meet applicable vibration criteria limits (if the locations of the rail and rail track connections are in the worst case locations as assessed for each alternative site layout). A combination of increasing the separation distance from the vibration source to the vibration sensitive receiver, and vibration control installed on the vibration source, would be required. The recommended site layout for the facility will be refined to implement appropriate vibration separation distances between vibration source and vibration sensitive receivers. The vibration effects assessment resultant from the recommended site layout is provided in Section 4.2.4.4 of the EPR.

Refer to the Noise and Vibration Report, Appendix C of the EPR, for further detail on the preliminary operational vibration assessment of the alternative site layouts.

2.2.9 Potential Effects on Air Quality

2.2.9.1 Construction Air Quality Assessment – Evaluation of the Alternative Site Layouts

The implementation of each alternative site layout will result in the disturbance of the full MSF property (8 ha), including a common scope of construction to each alternative. Therefore, the potential effects on air quality during construction are common to each alternative. The analysis of effects on Air Quality resultant from the construction of the preferred site layout is provided in the Air Quality Assessment Report, Appendix D.

2.2.9.2 Operational Air Quality Assessment – Evaluation of the Alternative Site Layouts

Facility source assumptions are also common to each alternative site layout. Further, the specific placement of emission sources on-site as represented in each alternative would not result in a significant variance in air quality effects over the study area; therefore, the potential effects on air quality during operation, as discussed below, are the same for each alternative.

The potential effects and associated maximum air dispersion modeling during operations are based on facility source assumptions included in **Section 1**. Further details of the assessment are provided in the Air Quality Assessment Report in Appendix D.

2.2.10 Potential Effects on Archaeological Resources

The implementation of each alternative site layout will result in the disturbance of the entire Finch West MSF property, therefore, any potential effects on archaeological resources would be the same for each alternative.

2.2.11 Potential Effects on Cultural Heritage

The implementation of each alternative site layout will result in the disturbance of the entire Finch West MSF property, therefore, any potential effects on cultural heritage would be the same for each alternative.

2.2.12 Potential Transportation and Traffic Effects

The transportation and traffic assumptions (see **Section 1.3**), (e.g. staffing, shift times, construction staging) and site access/egress locations are the same for each alternative site layout, therefore, the potential effects on roads, traffic and transit would be the same for each alternative. The analysis of traffic effects resultant from the preferred site layout is provided in Section 4.3 of the EPR.

2.2.13 Technical Considerations

As a final evaluation measure, a refined assessment of technical feasibility was completed for each of the alternative site layouts. The assessment determined that the relational groupings represented by Alternative Site Layout # 4 would be infeasible from an operational perspective. Due to the irregular property configuration, the track geometrics in the northwest portion of the site connecting the LRV storage yard to the Main Repair Shop would be insufficient to accommodate minimum LRV turning radii. Additionally, the access/egress driveway to York Gate Boulevard would conflict with LRV operation and movement within the LRV storage yard.

2.3 Evaluation Summary

Table 5 provides a summary evaluation of alternative site layouts incorporating the evaluation of potential environmental effects and further technical considerations.

Table 5: Summary Evaluation of Alternative Site Layouts

Evaluation Criteria	Potential Environmental Effects			
	Alternative Site Layout #1	**Alternative Site Layout #2**	**Alternative Site Layout #3**	**Alternative Site Layout #4**
Natural Environment				
Terrestrial and Natural Heritage	*Potential effects are considered the same for each Alternative Site Layout.*			
Surface Water and Aquatic Habitat	*Potential effects are considered the same for each Alternative Site Layout.*			
Geology and Groundwater	*Potential effects are considered the same for each Alternative Site Layout.*			
Socio-Economic Environment				
Land Use Designations	• Site elements triggering effects on land use designations would be the same.	• Site elements triggering effects on land use designations would be the same.	• Site elements triggering effects on land use designations would be the same. *Alternative Site Layout #3 is preferred as it may provide an opportunity to include an on-site configuration of buildings that has greater regard to the 'Avenues' policy of the Official Plan, specifically with respect to "improving the pedestrian environment" and "the look of the street" along Finch Avenue West (Toronto Official Plan 2010, Section 2.2.3).*	• Site elements triggering effects on land use designations would be the same.
Visual Character	• Potential for temporary (construction-related) and permanent (operation-related) visual effects due to MSF elements. *From the southern viewpoint (greater*	• Potential for temporary (construction-related) and permanent (operation-related) visual effects due to MSF elements.	• Potential for temporary (construction-related) and permanent (operation-related) visual effects due to MSF elements.	• Potential for temporary (construction-related) and permanent (operation-related) visual effects due to MSF elements.

Table 5: Summary Evaluation of Alternative Site Layouts

Evaluation Criteria	Potential Environmental Effects			
	Alternative Site Layout #1	**Alternative Site Layout #2**	**Alternative Site Layout #3**	**Alternative Site Layout #4**
	presence of visual sensitive receptors), the placement of the storage track yard at the southern perimeter of the site would likely result in a lower aesthetic value.	*From the southern viewpoint (greater presence of visual sensitive receptors), the placement of track crossovers at the southern perimeter of the site would likely result in a lower aesthetic value.*	*From the southern viewpoint (greater presence of visual sensitive receptors), the placement of buildings (incorporating urban-type design excellence features) would have potential to screen views of track and storage yard features at the rear of the site. Therefore this alternative is most preferred from a visual perspective. However, further mitigation and/or site redesign is recommended.*	*From the southern viewpoint (greater presence of visual sensitive receptors), the placement of track crossovers at the southern perimeter of the site would likely result in a lower aesthetic value.*
Community Features	• Changes to living conditions in the community due to project implementation. • Nuisance effects during construction and operation such as noise, dust, odour and traffic. • Loss of recreational land or disruption to recreational spaces is not anticipated. • Temporary changes in traffic flow or access or egress routes affecting businesses during construction. • Potential positive effects on businesses due to additional workforce in the area during construction and operation. • Increased levels of noise and vibration during construction and operation of the MSF. • Change to the character of the community by removing green space and adding additional buildings. • Facilitation of an increased community presence via an increased workforce. *Potential effects listed above are considered common to each Alternative Site Layout. Potential effects to be further refined during the impact assessment of the Preferred Site Layout.*			
Noise	• Potential for human annoyance due to construction noise. The sound quality from the construction will be typical of construction activities at	• Potential for human annoyance due to construction noise. The sound quality from the construction will be typical of	• Potential for human annoyance due to construction noise. The sound quality from the construction will be typical of	• Potential for human annoyance due to construction noise. The sound quality from the construction will be typical of

Table 5: Summary Evaluation of Alternative Site Layouts

Evaluation Criteria	Potential Environmental Effects			
	Alternative Site Layout #1	**Alternative Site Layout #2**	**Alternative Site Layout #3**	**Alternative Site Layout #4**
	other civil engineering projects. • Potential noise effects during operation would be 'high' (twice as loud or greater) at 4 assessment locations. The MSF will be out of compliance with the MOECC noise guidelines at most assessment locations in the absence of mitigation. *Potential construction noise effects would be the same for each alternative. Further consideration/ refinement of specific on-site element/building relations may reduce potential noise effects during operation by potentially screening noise.*	construction activities at other civil engineering projects. • Potential noise effects during operation would be 'high' (twice as loud or greater) at 3 assessment locations. The MSF will be out of compliance with the MOECC noise guidelines at all assessment locations in the absence of mitigation. *Potential construction noise effects would be the same for each alternative. Less potential for effects due to noise during operation of the MSF.*	construction activities at other civil engineering projects. • Potential noise effects during operation would be 'high' (twice as loud or greater) at 5 assessment locations. The MSF will be out of compliance with the MOECC noise guidelines at all assessment locations in the absence of mitigation. *Potential construction noise effects would be the same for each alternative. Further consideration/ refinement of specific on-site element/building relations may reduce potential noise effects during operation by potentially screening noise.*	construction activities at other civil engineering projects. • Potential noise effects during operation would be 'high' (twice as loud or greater) at 3 assessment locations. The MSF will be out of compliance with the MOECC noise guidelines at all assessment locations in the absence of mitigation. *Potential construction noise effects would be the same for each alternative. Less potential for effects due to noise during operation of the MSF.*
Vibration	*Potential effects are considered the same for each Alternative Site Layout. Potential effects to be further refined during the impact assessment of the Preferred Site Layout.*			
Air Quality	*Potential effects during construction and operation are considered generally common to each Alternative Site Layout. The placement of emission generating buildings and equipment on-site should be considered away from property lines, where possible. The implementation of additional operational mitigation measures will be required to ensure contaminant concentration levels below MOECC Standards/Guidelines.*			

Table 5: Summary Evaluation of Alternative Site Layouts

Evaluation Criteria	Potential Environmental Effects			
	Alternative Site Layout #1	**Alternative Site Layout #2**	**Alternative Site Layout #3**	**Alternative Site Layout #4**
Cultural Environment				
Archaeological Resources	*Potential effects are considered the same for each Alternative Site Layout.*			
Cultural and Built Heritage Resources	*Potential effects are considered the same for each Alternative Site Layout.*			
Traffic and Transportation				
Roads, Traffic, and Transit	*Potential effects are considered the same for each Alternative Site Layout.*			
Technical				
Operational Considerations	• Potential functionality from an operational perspective.	• Potential functionality from an operational perspective.	• Potential functionality from an operational perspective.	• Operational infeasibility. *Non-functional internal LRV circulation due to insufficient track geometrics and York Gate Boulevard access/egress driveway conflict with LRV Storage Yard.*
			Recommended Site Layout	