

# Southgate Drive Extension Noise Impact Study

Storage Facility Project

NewCold Advanced Cold Logistics

Project number: 60682143

April 19, 2023

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Revision	Revision date	Details	Authorized	Name	Position
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## 1. Introduction

AECOM Canada Ltd. (AECOM) has been retained by NewCold Advanced Cold Logistics (NewCold) to assess the noise impact from the Southgate Drive extension (the Project). This assessment is in support of their site plan and building permit approval to construct a cold storage facility (the Storage Facility) located at 384 Crawley Road, in Southgate Business Park, the City of Guelph.

The purpose of this assessment is to determine the impact of the Project-related traffic noise on nearby noise sensitive receptors, with respect to the Ministry of Transportation (MTO) and Ministry of the Environment (MOE) Protocol for Dealing with Noise Concerns During the Preparation, Review and Evaluation of Provincial Highways Environmental Assessments (The Protocol) requirements.

## 2. Background

The Project was identified as a priority in the NewCold Toronto Ontario (TO-01) Traffic Impact Study (AECOM, 2022) due to the proposed Storage Facility. The Project provides an opportunity to enhance and improve the features of the roadway and to accommodate the existing and future demands from the Storage Facility.

Southgate Drive is planned to be extended from its current terminus at the north side of the NewCold site westwards to a new intersection connection at Crawley Road as shown in **Figure 1**.

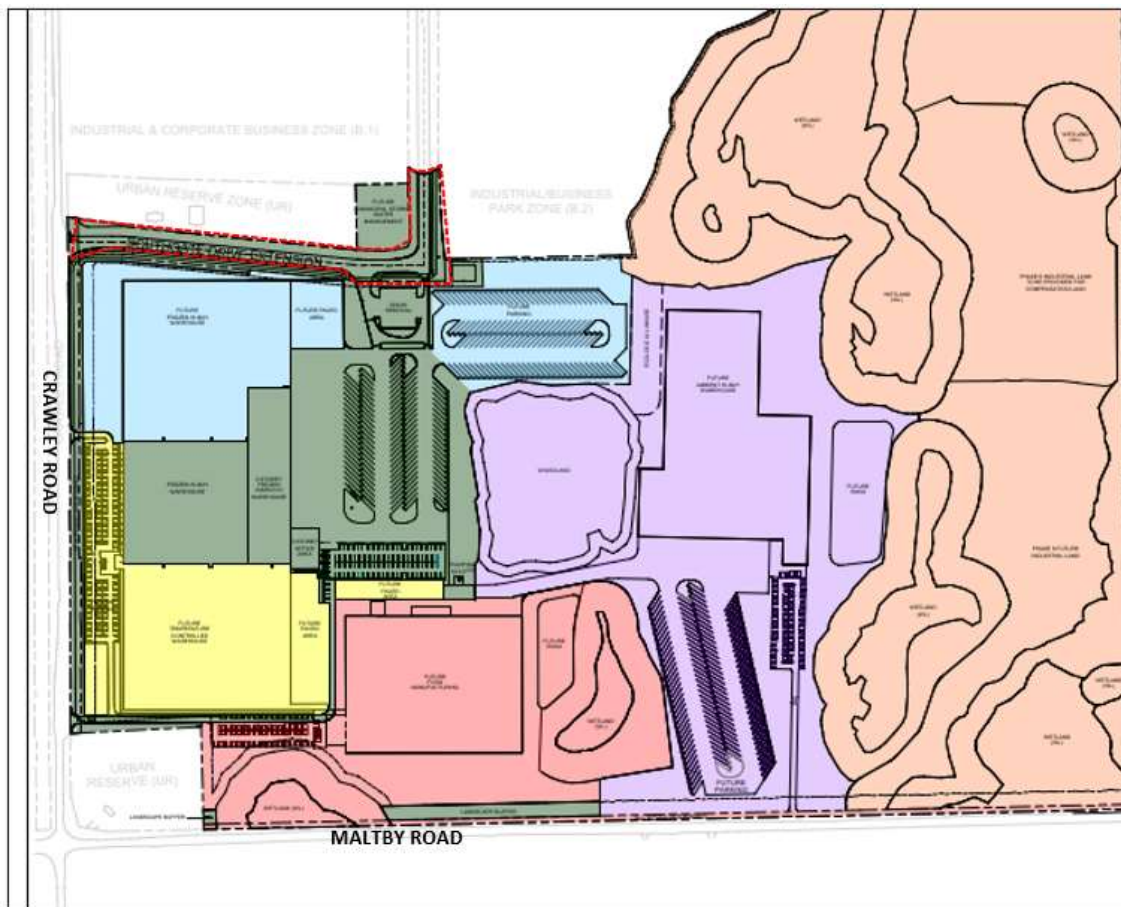


Figure 1. Project Area

### 3. Environmental Noise Guidelines

The Protocol sets out requirements for the assessment of road traffic noise impacts from provincial roads on noise sensitive areas. Noise impacts are to be predicted based on traffic projections ten years after completion, or best available data when 10-year projections are not available.

The Protocol sets an objective sound level as the higher of either 55 dBA or the ambient noise level in outdoor spaces. The significance of a noise impact is quantified using this objective in addition to the change in noise level above the ambient (e.g., future “without project” scenario). Mitigation investigation is required where the future “with project” noise levels are predicted to be greater than 5 dB above the ambient noise levels. A summary of mitigation effort requirements from the Protocol has been reproduced in **Table 1**.

**Table 1. Summary of Mitigation Effort**

Change in Noise Level Above Ambient	Mitigation Effort
0-5 dBA	None
>5 dBA	<ul style="list-style-type: none"> <li>Investigate noise control measures on right-of-way (R.O.W)</li> <li>If project cost is not significantly affected, introduce noise control measures within R.O.W</li> <li>Noise control measures, where introduced, should achieve a minimum of 5 dBA attenuation, over first row receivers</li> <li>Mitigate to ambient as administratively, economically, and technically feasible.</li> </ul>

### 4. Noise Sensitive Areas

One (1) residential location has been identified as representative of the noise sensitive areas within the study area. An outdoor receptor has been assessed three (3) metres from the façade of the residence, consistent with MTO noise guidelines. The receptor locations are described in **Table 2** and presented in **Appendix A**.

**Table 2. Noise Sensitive Receptor**

Assessment Location	Description
R01	Detached home, rear Outdoor Living Area

### 5. Noise Impact Assessment

#### Method

Traffic noise levels were calculated using the Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT) method, implemented in STAMSON (version 5.04) software. The prediction model incorporated the parameters presented in **Table 3**.

**Table 3. STAMSON Model Inputs**

Input	Parameter
Road traffic data	Volumes (Annual Average Daily Traffic, or AADT)
	Posted speed limit (kilometres per hour, or kph)
	Vehicle composition (percentage of medium and heavy trucks)
Ground Characteristics	Roadway surface type
	Ground Topography
	Shielding effects

Road traffic volumes for Southgate Drive and Crawley Road were taken from the NewCold Toronto Ontario (TO-01) Traffic Impact Study (AECOM, 2022) for both “without project” and “with project” horizon year of 2034. Road traffic volumes for Highway 6 (Hanlon Expressway) were taken from Provincial Highways Traffic Volumes, 1988-2010 (MTO, 2013). Hanlon Expressway traffic volumes for the horizon years of 2024 and 2034 were projected at 2% per year from 2010.

Road traffic volumes for Southgate Drive and Crawley Road were split into day and night volume ratios of 90% and 10%, respectively, as recommended in ORNMANENT guidelines for regional roads. Road traffic volumes for Hanlon Expressway was split into day and night volume ratios of 85% and 15%, respectively, as recommended in ORNMANENT guidelines for provincial roads. The Project noise impacts were assessed by comparing “with project” and “without project” 16-hour equivalent sound levels ( $L_{eq, 16hr}$ ) for the daytime period defined as 7:00 to 23:00 hours.

## Results

The noise assessment results are summarized in **Table 4**. Detailed calculations and traffic data including traffic volume, truck percentages, and speed are provided in **Appendix B**. A sample STAMSON noise calculation is provided in **Appendix C**. Noise impact was predicted for the horizon year of 2034, as the Project is planned to be completed in 2024.

**Table 4. Noise Assessment Result - Daytime**

Location	Predicted Day ( $L_{eq,16hr}$ ) (dBA)		Objective Noise Level (dBA)	Predicted Noise Impact (dB)	Mitigation Investigation Requirement (>5 dB impact)
	Year 2034 Without Project Noise Level	Year 2034 With Project Noise Level			
R01	65	67	65	2	No

Based on the results above, noise impacts are predicted to be less than 5 dB in the outdoor living area at R01. Therefore, mitigation measures are not required for the Project.

## 6. Conclusion

A traffic noise assessment has been completed for the Southgate Drive extension project. Based on the noise modelling results presented in **Table 4**, noise mitigation investigation is not required per the Protocol.



## 7. References

1. Ontario Ministry of the Environment, *Ontario Road Noise Analysis Method for Environment and Transportation (ORNAMENT)*. Queen's Printer for Ontario, 1990.
2. Ministry of Transportation Ontario, Ministry of the Environment, *Protocol for Dealing with Noise Concerns During the Preparation, Review and Evaluation of Provincial Highways Environmental Assessments*, 1996.
3. Ministry of Transportation, *Environmental Guide for Noise*, 2006.
4. AECOM, *NewCold Toronto Ontario (TO-01) Traffic Impact Study*, March 2022.
5. Ministry of Transportation Ontario, Ministry of the Environment, *Provincial Highways, Traffic Volumes, 1998-2010, 2013*.

## **Appendix A Future Road Extension and Receptor Location**



## Appendix B Traffic Calculation Data

RECEIVER	SOURCE	Road Grade	Future with No Project														Future With Project																									
			B1	B2	TOPO	WOODS	No. Rows	@ Density	Ground Surface Type	Receiver Height (m)	Source Receiver Dist (m)	Barr #1	Barr #2	Barrier Height (m)	Barrier Receiver Distance (m)	Elevation Change (e) (m)	Source Ground Elevation (m)	Receiver Ground Elevation (m)	Base of Barrier Elevation (m)	Leq (Day), using 10x traffic (dB(A))	Corrected Leq (Day) (dB(A))	B1	B2	TOPO	WOODS	No. Rows	@ Density	Ground Surface Type	Receiver Height (m)	Source Receiver Dist (m)	Barr #1	Barr #2	Barrier Height (m)	Barrier Receiver Distance (m)	Elevation Change (e) (m)	Source Ground Elevation (m)	Receiver Ground Elevation (m)	Base of Barrier Elevation (m)	Leq (Day), using 10x traffic (dB(A))	Corrected Leq (Day) (dB(A))		
R01	Crawley Rd	grade = 0%	-90	-30	3	-	-	-	2	1.5	115	-	-	-	-	1	343	344	-	47.4	37.4	-90	-30	3	-	-	-	2	1.5	115	-	-	-	-	1	343	344	-	58.9	48.9		
		grade = 3.6%	-30	15	3	-	-	-	2	1.5	115	-	-	-	-	2	342	344	-	46.2	36.2	-30	15	3	-	-	-	2	1.5	115	-	-	-	-	2	342	344	-	58.4	48.4		
	grade = 4.2	15	90	3	-	-	-	2	1.5	115	-	-	-	-	3	341	344	-	48.4	38.4	15	90	3	-	-	-	2	1.5	115	-	-	-	-	3	341	344	-	60.6	50.6			
	grade = 3.2%	-90	-75	4	-	-	-	2	1.5	27	-90	-75	6	5	1	345	344	344	32.0	22.0	-90	-75	4	-	-	-	2	1.5	27	-90	-75	6	5	1	345	344	344	45.6	35.6			
	grade = 0%	-75	-30	4	-	-	-	2	1.5	27	-75	-30	6	5	1	345	344	344	29.3	19.3	-75	-30	4	-	-	-	2	1.5	27	-75	-30	6	5	1	345	344	344	42.4	32.4			
	grade = 5%	-90	60	4	-	-	-	2	1.5	27	-90	0	6	5	1	345	344	344	48.8	38.8	-90	60	4	-	-	-	2	1.5	27	-90	0	6	5	1	345	344	344	62.7	52.7			
	grade = 2%	60	75	3	-	-	-	2	1.5	27	-	-	-	-	2	342	344	-	54.2	44.2	60	75	3	-	-	-	2	1.5	27	-	-	-	-	2	342	344	-	56.1	46.1			
	Highway 6 (Hanton Expressway) SB	grade <2%	-90	90	1	-	-	-	1	1.5	192	-	-	-	-	-	-	-	-	-	61.6	90	1	-	-	-	1	1.5	192	-	-	-	-	-	-	-	-	62.5	-			
Highway 6 (Hanton Expressway) NB	grade <2%	-90	90	1	-	-	-	1	1.5	165	-	-	-	-	-	-	-	-	-	62.7	90	1	-	-	-	1	1.5	165	-	-	-	-	-	-	-	-	63.6	-				
<b>Total</b>																					<b>65</b>																				<b>Total</b>	<b>67</b>
																																									<b>Project Impact</b>	<b>2</b>

Source	Future without Project Data					Future with Project AADT DATA					Road Only Parameters		
	Year	AADTe or 1hr or #Trains	%M.T. or #MT or #Loc	%H.T. or #HT or #Cars	Speed Limit (kph)	Year	AADTf or 1hr or #Trains	%M.T. or #MT or #Loc	%H.T. or #HT or #Cars	Speed Limit (kph)	Grade %	Pavement Type	Day/Night Split
Crawley Rd	2024	830	0.0%	0.0%	60	2034	2610	4.0%	6.3%	60	varies	1	90/10
Southgate Dr	2024	450	0.0%	0.0%	50	2034	2350	2.3%	3.7%	50	varies	1	90/10
Hanlon HWY 6	2024	128122	8.9%	14.1%	80	2034	156180	8.9%	14.1%	80	<2%	1	85/15

Note: Assumed heavy trucks are 62% of overall truck percentages per MTO Env. Guidelines

## Appendix C Sample Traffic Noise Calculation

MINISTRY OF ENVIRONMENT AND ENERGY / NOISE ASSESSMENT

Filename: r01\_np.te Time Period: Day/Night 16/8 hours

Description:

Road data, segment # 1: Craw Rd (day/night)

-----  
Car traffic volume : 7470/830 veh/TimePeriod \*

Medium truck volume : 0/0 veh/TimePeriod \*

Heavy truck volume : 0/0 veh/TimePeriod \*

Posted speed limit : 60 km/h

Road gradient : 0 %

Road pavement : 1 (Typical asphalt or concrete)

\* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 8300

Percentage of Annual Growth : 0.00

Number of Years of Growth : 0.00

Medium Truck % of Total Volume : 0.00

Heavy Truck % of Total Volume : 0.00

Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 1: Craw Rd (day/night)

-----  
Angle1 Angle2 : -90.00 deg -30.00 deg

Wood depth : 0 (No woods.)

No of house rows : 0 / 0

Surface : 2 (Reflective ground surface)

Receiver source distance : 115.00 / 115.00 m

Receiver height : 1.50 / 1.50 m

Topography : 3 (Elevated; no barrier)

Elevation : 1.00 m

Reference angle : 0.00



Road data, segment # 2: Craw Rd (day/night)

-----

Car traffic volume : 7470/830 veh/TimePeriod \*

Medium truck volume : 0/0 veh/TimePeriod \*

Heavy truck volume : 0/0 veh/TimePeriod \*

Posted speed limit : 60 km/h

Road gradient : 4 %

Road pavement : 1 (Typical asphalt or concrete)

\* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 8300

Percentage of Annual Growth : 0.00

Number of Years of Growth : 0.00

Medium Truck % of Total Volume : 0.00

Heavy Truck % of Total Volume : 0.00

Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 2: Craw Rd (day/night)

-----

Angle1 Angle2 : -30.00 deg 15.00 deg

Wood depth : 0 (No woods.)

No of house rows : 0 / 0

Surface : 2 (Reflective ground surface)

Receiver source distance : 115.00 / 115.00 m

Receiver height : 1.50 / 1.50 m

Topography : 3 (Elevated; no barrier)

Elevation : 2.00 m

Reference angle : 0.00

Road data, segment # 3: Craw Rd (day/night)

-----

Car traffic volume : 7470/830 veh/TimePeriod \*

Medium truck volume : 0/0 veh/TimePeriod \*

Heavy truck volume : 0/0 veh/TimePeriod \*

Posted speed limit : 60 km/h

Road gradient : 4 %

Road pavement : 1 (Typical asphalt or concrete)

\* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 8300

Percentage of Annual Growth : 0.00

Number of Years of Growth : 0.00

Medium Truck % of Total Volume : 0.00

Heavy Truck % of Total Volume : 0.00

Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 3: Craw Rd (day/night)

-----

Angle1 Angle2 : 15.00 deg 90.00 deg

Wood depth : 0 (No woods.)

No of house rows : 0 / 0

Surface : 2 (Reflective ground surface)

Receiver source distance : 115.00 / 115.00 m

Receiver height : 1.50 / 4.50 m

Topography : 3 (Elevated; no barrier)

Elevation : 3.00 m

Reference angle : 0.00

Road data, segment # 4: South Dr (day/night)

-----

Car traffic volume : 4050/450 veh/TimePeriod \*

Medium truck volume : 0/0 veh/TimePeriod \*

Heavy truck volume : 0/0 veh/TimePeriod \*

Posted speed limit : 50 km/h

Road gradient : 3 %

Road pavement : 1 (Typical asphalt or concrete)

\* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 4500

Percentage of Annual Growth : 0.00

Number of Years of Growth : 0.00

Medium Truck % of Total Volume : 0.00

Heavy Truck % of Total Volume : 0.00

Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 4: South Dr (day/night)

-----

Angle1 Angle2 : -90.00 deg -75.00 deg

Wood depth : 0 (No woods.)

No of house rows : 0 / 0

Surface : 2 (Reflective ground surface)

Receiver source distance : 27.00 / 27.00 m

Receiver height : 1.50 / 4.50 m

Topography : 4 (Elevated; with barrier)

Barrier angle1 : -90.00 deg Angle2 : -75.00 deg

Barrier height : 6.00 m

Elevation : 1.00 m

Barrier receiver distance : 5.00 / 5.00 m

Source elevation : 345.00 m

Receiver elevation : 344.00 m

Barrier elevation : 344.00 m

Reference angle : 0.00

Road data, segment # 5: South Dr (day/night)

-----

Car traffic volume : 4050/450 veh/TimePeriod \*

Medium truck volume : 0/0 veh/TimePeriod \*

Heavy truck volume : 0/0 veh/TimePeriod \*

Posted speed limit : 50 km/h

Road gradient : 0 %

Road pavement : 1 (Typical asphalt or concrete)

\* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 4500

Percentage of Annual Growth : 0.00

Number of Years of Growth : 0.00

Medium Truck % of Total Volume : 0.00

Heavy Truck % of Total Volume : 0.00

Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 5: South Dr (day/night)

-----

Angle1 Angle2 : -75.00 deg -30.00 deg

Wood depth : 0 (No woods.)

No of house rows : 0 / 0

Surface : 2 (Reflective ground surface)

Receiver source distance : 27.00 / 27.00 m

Receiver height : 1.50 / 4.50 m

Topography : 4 (Elevated; with barrier)

Barrier angle1 : -75.00 deg Angle2 : -30.00 deg

Barrier height : 6.00 m

Elevation : 1.00 m

Barrier receiver distance : 5.00 / 5.00 m

Source elevation : 345.00 m

Receiver elevation : 344.00 m

Barrier elevation : 344.00 m

Reference angle : 0.00

Road data, segment # 6: South Dr (day/night)

-----

Car traffic volume : 4050/450 veh/TimePeriod \*

Medium truck volume : 0/0 veh/TimePeriod \*

Heavy truck volume : 0/0 veh/TimePeriod \*

Posted speed limit : 50 km/h

Road gradient : 5 %

Road pavement : 1 (Typical asphalt or concrete)

\* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 4500

Percentage of Annual Growth : 0.00

Number of Years of Growth : 0.00

Medium Truck % of Total Volume : 0.00

Heavy Truck % of Total Volume : 0.00

Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 6: South Dr (day/night)

-----

Angle1 Angle2 : -30.00 deg 60.00 deg

Wood depth : 0 (No woods.)

No of house rows : 0 / 0

Surface : 2 (Reflective ground surface)

Receiver source distance : 27.00 / 27.00 m

Receiver height : 1.50 / 4.50 m

Topography : 4 (Elevated; with barrier)

Barrier angle1 : -30.00 deg Angle2 : 0.00 deg

Barrier height : 6.00 m

Elevation : 1.00 m

Barrier receiver distance : 5.00 / 5.00 m

Source elevation : 345.00 m

Receiver elevation : 344.00 m

Barrier elevation : 344.00 m

Reference angle : 0.00

Road data, segment # 7: South Dr (day/night)

-----

Car traffic volume : 4050/450 veh/TimePeriod \*

Medium truck volume : 0/0 veh/TimePeriod \*

Heavy truck volume : 0/0 veh/TimePeriod \*

Posted speed limit : 50 km/h

Road gradient : 2 %

Road pavement : 1 (Typical asphalt or concrete)

\* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 4500

Percentage of Annual Growth : 0.00

Number of Years of Growth : 0.00

Medium Truck % of Total Volume : 0.00

Heavy Truck % of Total Volume : 0.00

Day (16 hrs) % of Total Volume : 90.00

Data for Segment # 7: South Dr (day/night)

-----

Angle1 Angle2 : 60.00 deg 75.00 deg

Wood depth : 0 (No woods.)

No of house rows : 0 / 0

Surface : 2 (Reflective ground surface)

Receiver source distance : 27.00 / 27.00 m

Receiver height : 1.50 / 4.50 m

Topography : 3 (Elevated; no barrier)

Elevation : 2.00 m

Reference angle : 0.00

Road data, segment # 8: hwy 6 SB (day/night)

-----

Car traffic volume : 41928/7399 veh/TimePeriod \*  
Medium truck volume : 4846/855 veh/TimePeriod \*  
Heavy truck volume : 7678/1355 veh/TimePeriod \*  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

\* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 48550  
Percentage of Annual Growth : 2.00  
Number of Years of Growth : 14.00  
Medium Truck % of Total Volume : 8.90  
Heavy Truck % of Total Volume : 14.10  
Day (16 hrs) % of Total Volume : 85.00

Data for Segment # 8: hwy 6 SB (day/night)

-----

Angle1 Angle2 : -90.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 1 (Absorptive ground surface)  
Receiver source distance : 192.00 / 15.00 m  
Receiver height : 1.50 / 4.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00

Road data, segment # 9: hwy 6 NB (day/night)

-----

Car traffic volume : 41928/7399 veh/TimePeriod \*  
Medium truck volume : 4846/855 veh/TimePeriod \*  
Heavy truck volume : 7678/1355 veh/TimePeriod \*  
Posted speed limit : 80 km/h  
Road gradient : 0 %  
Road pavement : 1 (Typical asphalt or concrete)

\* Refers to calculated road volumes based on the following input:

24 hr Traffic Volume (AADT or SADT): 48550  
Percentage of Annual Growth : 2.00  
Number of Years of Growth : 14.00  
Medium Truck % of Total Volume : 8.90  
Heavy Truck % of Total Volume : 14.10  
Day (16 hrs) % of Total Volume : 85.00

Data for Segment # 9: hwy 6 NB (day/night)

-----

Angle1 Angle2 : -90.00 deg 90.00 deg  
Wood depth : 0 (No woods.)  
No of house rows : 0 / 0  
Surface : 1 (Absorptive ground surface)  
Receiver source distance : 165.00 / 15.00 m  
Receiver height : 1.50 / 4.50 m  
Topography : 1 (Flat/gentle slope; no barrier)  
Reference angle : 0.00



Result summary (day)

-----

! source ! Road ! Total  
! height ! Leq ! Leq  
! (m) ! (dBA) ! (dBA)

-----+-----+-----+-----

1.Craw Rd	!	0.50	!	47.40	!	47.40
2.Craw Rd	!	0.50	!	46.15	!	46.15
3.Craw Rd	!	0.50	!	48.37	!	48.37
4.South Dr	!	0.50	!	32.02	!	32.02
5.South Dr	!	0.50	!	29.31	!	29.31
6.South Dr	!	0.50	!	48.83	!	48.83
7.South Dr	!	0.50	!	42.79	!	42.79
8.hwy 6 SB	!	1.94	!	61.63	!	61.63
9.hwy 6 NB	!	1.94	!	62.71	!	62.71

-----+-----+-----+-----

Total            65.54 dBA

Result summary (night)

-----

! source ! Road ! Total  
! height ! Leq ! Leq  
! (m) ! (dBA) ! (dBA)

-----+-----+-----+-----

1.Craw Rd	!	0.50	!	40.87	!	40.87
2.Craw Rd	!	0.50	!	39.62	!	39.62
3.Craw Rd	!	0.50	!	41.84	!	41.84
4.South Dr	!	0.50	!	28.84	!	28.84
5.South Dr	!	0.50	!	28.80	!	28.80
6.South Dr	!	0.50	!	42.35	!	42.35
7.South Dr	!	0.50	!	36.26	!	36.26
8.hwy 6 SB	!	1.94	!	75.50	!	75.50
9.hwy 6 NB	!	1.94	!	75.50	!	75.50

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Total                    78.51 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 65.54  
(NIGHT): 78.51

