

APPENDIX

L

NOISE IMPACT
ASSESSMENT
REPORT



CITY OF BRAMPTON

LAGERFELD DRIVE CLASS ENVIRONMENTAL ASSESSMENT NOISE IMPACT ASSESSMENT

JULY 08, 2020





LAGERFELD DRIVE
CLASS
ENVIRONMENTAL
ASSESSMENT
NOISE IMPACT
ASSESSMENT

CITY OF BRAMPTON

PROJECT NO.: 141-15409-00

DATE: JULY 08, 2020

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July 08, 2020

CITY OF BRAMPTON
2 Wellington Street West
Brampton ON
L6Y 4RT

Attention: Mario Goolsarran, P.Eng., PMP

Dear Madam:

Subject: Lagerfeld Drive Class Environmental Assessment - Noise Impact Assessment

WSP is pleased to provide you with the following report detailing the noise impact assessment of the proposed project to connect lands west of Mississauga Road to Mount Pleasant GO Station located in the City of Brampton, Ontario.

We trust that our submission meets your approval and we look forward to continued opportunity to work with you. If you have any questions regarding our report, please contact the undersigned at (905) 750-3080 or via email at Marcin.Burdzy@wsp.com.

Yours truly,

Marcin Burdzy
Acoustic, Noise & Vibration Specialist

MB/CDS

WSP ref.: 141-15409-00

SIGNATURES

PREPARED BY



Marcin Burdzy, M.Sc.Eng.
Acoustics, Noise & Vibration Specialist

July 8, 2020
Date

APPROVED¹ BY



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July 8, 2020
Date

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1 INTRODUCTION

The City of Brampton has retained the services of WSP Canada Inc. (WSP) to prepare a Noise Impact Study for the Class Environmental Assessment (Class EA) for the proposed east-west connection from Mount Pleasant GO Station to the lands west of Mississauga Road located in the City of Brampton, Ontario. The east-west connection road is referred to as “Lagerfeld Drive” throughout the report.

The purpose of the study is to identify the noise sensitive areas within the Study Area, assess the potential noise effect due to the Lagerfeld Drive and determine if noise mitigation is warranted at these noise sensitive areas. The assessment includes reviewing future conditions with and without the implementation of the Lagerfeld Drive.

This report was based on the Preliminary Preferred Plan & Profile prepared by WSP, dated December 2019 and included as **Appendix A**.

1.1 PROJECT DESCRIPTION

The Lagerfeld Drive is a 4-lane roadway with approximately 1.5 km in length; and stems from the Creditview Boulevard and Lagerfeld Drive intersection, will extend westerly to the lands west of Mississauga Road crossing over the TransCanada Pipeline. The Lagerfeld Drive, and its immediate surroundings are shown in **Figure 1**. The extension has no definitive completion date planned as of this Report.

1.2 STUDY AREA

The Study Area is currently surrounded by green space, including a provincially significant wetland and Huttonville Creek, in addition to residential developments. The Canadian National Railway runs east-west and located to the north of the Lagerfeld Drive.

The acoustical environment of the Study Area is suburban in nature with surrounding lands allotted for commercial and residential purposes. There are existing residential developments located to the north, northeast and southeast of the Study Area.

The Study Area is also shown on **Figure 1**.

2 ENVIRONMENTAL NOISE GUIDELINES

2.1 CITY OF BRAMPTON

The City of Brampton’s “Noise Attenuation – Retrofit Policy and Road Widening” (City of Brampton Council Report, October 2007) proposes noise walls for road widening to six lanes adjacent to existing properties, where noise levels in Outdoor Living Areas are above 60 dBA for the 16-hour period between 07:00 to 23:00 hours and only if a reduction of at least 5 dB in sound level is attainable.

Table 1 summarizes the City’s noise wall policy for capital projects – widening to six lanes.

Table 1 City of Brampton Mitigation Effort Requirement

CRITERIA	MITIGATION EFFORT REQUIRED
Projected noise levels with proposed improvement is less than or equal to 60 dBA	– None.
Projected noise levels with proposed improvement is greater than 60 dBA	<ul style="list-style-type: none"> – Investigate noise measures on right-of-way. – Introduce noise control measures within the City’s right-of-way and mitigate to ambient if technically, economically and administratively feasible. – Noise control measures were introduced; It should achieve a minimum of 5 dB reduction in sound levels at the outdoor living areas for existing residential properties that have reverse frontage or side flanking onto City roads.

2.2 MTO – ENVIRONMENTAL GUIDE FOR NOISE

The Ontario Ministry of Transportation (MTO) document, “*Environmental Guide for Noise*”, dated October 2006, updated July 2008, (MTO Document) provides requirements for noise assessment and mitigation relating to the construction of new or the expansion of existing Provincial Highways and thus, has been adopted in this assessment.

It should be noted that the MTO Document updates, improves and supersedes the MTO/MOE (Ministry of Environment) Noise Protocol and the MTO Quality of Standards Directive A-1 – Noise Policy and Acoustical Standards for Provincial Highways.

Table 2 summarizes the applicable criteria for this assessment.

Table 2 MTO Mitigation Effort Requirement

CRITERIA	MITIGATION EFFORT REQUIRED
Change in noise level above ambient is less than 5 dB AND Projected noise levels with proposed improvement is less than 65 dBA	– None.

<p>Change in noise level above ambient is greater than or equal to 5 dB</p> <p style="text-align: center;">OR</p> <p>Projected noise levels with proposed improvement is greater than or equal to 65 dBA</p>	<ul style="list-style-type: none"> — Investigate noise measures on right-of-way. — Introduce noise control measures within right-of-way and mitigate to ambient if technically, economically and administratively feasible. — Noise control measures were introduced; should achieve a minimum of 5 dB attenuation, over first row receivers.
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The guideline provides the following as possible mitigation measures:

- Acoustical barriers;
- Berms;
- Vertical and horizontal alignments; and
- Pavement surfaces.

The MTO Document states that mitigation must attempt to achieve sound levels as close to, or lower than, the objective level (i.e. future predicted ambient without the proposed improvements) as is technically, economically, and administratively feasible.

3 ENVIRONMENTAL NOISE ASSESSMENT

The two scenarios considered in the assessment are the following:

- **Scenario 1: Future “No Build”**. This scenario only includes a 6-lane Mississauga Road, without the Lagerfeld Drive.
- **Scenario 2: Future “Build”**. The assessment under this scenario includes a 6-lane Mississauga Road with the Lagerfeld Drive.

3.1 ROAD TRAFFIC DATA

Noise impact studies due to traffic typically require a minimum 10-year traffic forecast from the project completion date. Because the Lagerfeld Drive extension has no definitive completion date, ultimate traffic data was used for this study.

Ultimate traffic data along with day-night splits, and medium and heavy truck percentages for Mississauga Road in both scenarios was provided by the Region of Peel and is included in **Appendix B**. Traffic data for Lagerfeld Drive was conservatively estimated based on its designed lane capacity from the report, “Environmental Assessment Study – East-West Connection Mount Pleasant GO Station to West of Mississauga Road, Phase 1 – Traffic Report”, dated June 2015 (Traffic Report). Hourly lane capacity values were multiplied by a factor of 12.5 to obtain 24-hour traffic volumes for all 4 lanes.

For Lagerfeld Drive, the day/night split, medium and heavy truck percentages were assumed to be 90%/10%, 2%, and 3%, respectively, as is typical for collector roadways. The posted speed limit for both roads was provided.

Table 3 summarizes the road traffic data used in the assessment.

Table 3 Road Traffic Data

ROADWAY	ULTIMATE 24-HR TRAFFIC DATA	NO. OF LANES	DAY/NIGHT SPLIT (%)	MEDIUM TRUCKS (%)	HEAVY TRUCKS (%)	POSTED SPEED LIMIT (KPH)
Mississauga Road ¹ (Scenario 1)	48,100	6	89/11	Day: 0.6% Night: 0.3%	Day: 6.8% Night: 6.1%	80
Mississauga Road ¹ (Scenario 2)	48,100	6	89/11	Day: 0.6% Night: 0.3%	Day: 6.8% Night: 6.1%	80
Lagerfeld Drive (Scenario 2)	32,500 ²	4	90/10 ³	Day: 2% ³ Night: 2%	Day: 3% ³ Night: 3%	50

- Notes: ¹ Data obtained from the Region of Peel
² Conservative estimate based on designed hourly lane capacity.
³ Typical values for collector roads

3.2 ANALYSIS METHOD

The sound level predictions were calculated using STAMSON version 5.04, a computer software developed by the Ministry of Environment, Conservation and Parks (MECP) implementing the algorithm, ORNAMENT (Ontario Roads Noise Analysis Method for Environment and Transportation).

The following factors were considered in the analysis:

- Traffic volumes;
- Traffic composition (cars, medium and heavy truck volumes);
- Vehicle speeds;
- Horizontal and vertical road-receiver geometry (obtained from design drawings and scaled area maps);
- Ground absorption; and
- Screening provided by terrain, houses or existing barriers.

Roads with more than four lanes, such as Mississauga Road, were modelled as two segments based on traffic direction.

The 16-hour Equivalent Sound Levels, $L_{eq\ 16\text{-hour}}$ (07:00 to 23:00 hours, expressed in dBA) were calculated using the road traffic data in **Table 2**. Sound levels for both scenarios were predicted at 3 m from the most exposed side, at a height of 1.2 m high above ground as part of the initial screening process. The southeast façade was determined to be the most exposed side with respect to Lagerfeld Drive.

If required after the initial screening process, sound level prediction will be conducted at the Outdoor Living Area (OLA) located at 3 m from the rear wall of the dwelling to determine if noise mitigation is warranted. A sample STAMSON output file is included in **Appendix C**.

3.3 NOISE SENSITIVE AREAS

A single-unit residential dwelling on the east side of Mississauga Road between Bovaird Drive and Sandalwood Parkway, with municipal address 10179 Mississauga Road, was determined to be the nearest sensitive receptor to the Lagerfeld Drive. **Figure 1** shows the receptor location.

Any other receptors with similar or greater setbacks will have sound levels equal or less than those predicted. Setback distances to the most exposed side are summarized in **Table 4** below.

Table 4 Summary of Setback Distances

RECEPTOR	RECEPTOR ID	MOST EXPOSED FAÇADE	ROAD/SEGMENT	DISTANCE (m)
10179 Mississauga Road	R01 (Most Exposed Side)	Southwest	Mississauga Road Northbound	55
			Mississauga Road Southbound	72
			Lagerfeld Drive	82

3.4 RESULTS

Table 5 summarizes the predicted sound levels for both scenarios, as well as the change in sound levels due to the project.

Table 5 Summary of Predicted Sound Levels

RECEPTOR ID	NO. OF NOISE SENSITIVE LAND USES	ROADWAY	PREDICTED SOUND LEVEL (LEQ 16-HOUR, dBA)		CHANGE DUE TO UNDERTAKING [B] – [A]
			Scenario 1 FUTURE “NO BUILD” [A]	Scenario 2 FUTURE “BUILD” [B]	
R01 ¹ (Most Exposed Side)	2	Mississauga Road, Northbound	60.1	60.1	0.6
		Mississauga Road, Southbound	62.0	62.0	
		Lagerfeld Drive ²	n/a	56.0	
		TOTAL	64.2	64.8	
R02 ¹ (Outdoor Living Area)	2	Mississauga Road, Northbound	51.6	51.6	2.7
		Mississauga Road, Southbound	50.0	50.0	
		Lagerfeld Drive ²	n/a	53.3	
		TOTAL	53.9	56.6	

Notes: ¹ Assessed at 1.2 m high above grade, as per the MTO Document.

² Lagerfeld Drive does not exist under Scenario 1 “No Build”.

n/a – not applicable

As can be seen on **Table 5**, the predicted sound levels at the most exposed side for both future scenarios (“No Build” and “Build” scenarios) are less than the MTO’s 65 dBA design objective and the change in sound level is less than 5 dB. Thus, noise mitigation is not needed to comply with the requirements outlined in the MTO Document.

The predicted sound level at most exposed side, receptor R01, exceeded the City of Brampton’s 60 dBA design objective. Thus, sound levels due to the undertaking has been predicted at the outdoor living area of receptor R01.

As can be seen on **Table 5**, the predicted sound level at the outdoor living area of R01 is 57 dBA. This is below the 60 dBA design object of the City and thus, noise mitigation is needed.

It should be noted that there are future residential developments planned along Lagerfeld Drive. Noise mitigation measures needed to comply with the applicable noise guidelines at these future developments along Lagerfeld Drive should be the responsibility of developers.

4 CONSTRUCTION NOISE

There is a potential for a significant noise effect at the surrounding noise sensitive areas during the construction phase of the project. The following noise guidelines provide prohibitions and/or limits for construction-related noise.

4.1 CITY OF BRAMPTON NOISE BY-LAW

The City of Brampton By-Law 93-84 was developed to prohibit and regulate noise effects within the municipality or within any defined area where noises likely to disturb inhabitants.

With respect to prohibitions, the City of Brampton Noise By-law specifically prohibits noises from operating construction equipment daily before 7:00 am and after 11:00 pm. However, Section 4, Item 10 of the Noise By-law states that any sound arising from road work and road improvements undertaken by or on behalf of the MTO or the Region of Peel is permitted by this by-law and is not to be considered a contravention of this by-law.

4.2 MECP SOUND EMISSION STANDARDS

The MECP publication, NPC-115 “Construction Equipment” provides sound emission standards for various types of construction equipment. It should be noted that these sound emission standards apply on individual pieces of equipment, instead of a site-wide performance limits or at the nearby receptors.

Table 6 summarizes the sound emission standards for select construction equipment. Refer to the publication NPC-115 for other construction equipment and activities.

Table 6 NPC-115 Sound Emission Standards

TYPE OF EQUIPMENT (MANUFACTURED AFTER JANUARY 1, 1981)	MAXIMUM SOUND LEVEL (DBA)
Excavation equipment, dozers, loaders, backhoes or other equipment or other equipment capable of being used for a similar application ¹	83 (Power Rating < 75 kW)
	85 (Power Rating ≥ 75 kW)
Pneumatic Pavement Breakers ²	85 (for both Quiet Zone and Residential Area)
Portable Air Compressors ²	70 (Quiet Zone) 76 (Residential Area)
Tracked Drills ¹	100 (for both Quiet Zone and Residential Area)

1. Maximum Sound Level (dBA) as determined using Publication NPC-103 – Procedures, Section 6

2. Maximum Sound Level (dBA) as measured using Publication NPC-103 – Procedures, Section 7

4.3 RECOMMENDED MITIGATION MEASURES

Although noise arising from road work and road improvements related to this project is permitted by and is not considered a contravention of the City of Brampton Noise By-law, it is still recommended to minimize the construction-related noise to reduce the potential noise effect at the surrounding noise sensitive areas.

The following noise mitigation measures, but not limited to, are recommended for considerations:

- Limit the major construction activities during the daytime hours only (i.e. 07:00 to 19:00 hours) and avoid evening and nighttime construction (19:00 to 07:00 hours).
- Combine all noisy activities to occur in the same time period. The combined sound level will not be significantly greater than the sound level if done separately.
- Install and maintain noise mitigation mechanisms such as muffler systems on construction equipment;
- Consider alternative construction methods (less intense).
- Use quieter construction equipment.
- Re-route the truck traffic away from the noise sensitive areas.
- Implement no idling policy and turn off construction equipment when not in use.
- Construct temporary sound barriers between the noisy construction activities and the noise sensitive areas, if feasible.

5 CONCLUSIONS

WSP was retained by the City of Brampton to assess the potential noise effect of the project at the noise sensitive areas. The assessment indicated that the predicted sound levels generated from traffic associated with the extension of Lagerfeld Drive, at the most exposed side of the nearest noise sensitive area, meet the MTO's design objective and the change in sound level is such that noise mitigation measures are not required.

The predicted sound level at the most exposed side exceeded the City's design objective and thus, sound level is predicted at the outdoor living area. The sound level at the outdoor living area is predicted to be in compliance with the City's 60 dBA objective without the need for noise control mitigation for noise control purposes.

Although noise arising from this project is permitted by and is not considered a contravention of the City of Brampton's Noise By-law, it is still recommended to minimize the construction-related noise to reduce the potential noise effect at the surrounding noise sensitive areas. Noise mitigation measures are provided for considerations.

FIGURES





126 DON HILLOCK DRIVE, UNIT 2
 AURORA, ONTARIO CANADA L4G 0G9
 TEL.: 905-750-3080 | FAX: 905-727-0463 | WWW.WSP.COM

LEGEND

- PROPOSED ALIGNMENT
- 10179 MISSISSAUGA ROAD



50 25 0 50 Metres

Data Source: Ministry of Natural Resources, Ontario Base Mapping, October 2016.

CLIENT:

CITY OF BRAMPTON

PROJECT:

NOISE IMPACT ASSESSMENT
 LAGERFELD DRIVE CLASS
 ENVIRONMENTAL ASSESSMENT
 BRAMPTON, ONTARIO

PROJECT NO:
 141-15409-00 17

DATE:
 JULY 2020

DESIGNED BY:

DRAWN BY:

T.P.

CHECKED BY:

FIGURE NO:

1

SCALE:

1:4,000

TITLE:

STUDY AREA

DISCIPLINE:

ENVIRONMENT

ISSUE:

DRAFT

REV.:

-

APPENDIX

A RELATED DESIGN DRAWINGS



APPENDIX

B

TRAFFIC DATA



Date: July 3, 2019
 From: Marcin Burdzy, WSP
 Re: Ultimate Traffic Data Request – Mississauga Rd between Wanless Dr and Bovaird Dr

Marcin,
 As per your request, we are providing the following traffic data:

	Existing	Ultimate
24 Hour Traffic Volume	5,708	48,100
# of Lanes	2	6
Day/Night Split	89/11	89/11
Day Trucks (% of Total Volume)	0.6% Medium 6.8% Heavy	0.6% Medium 6.8% Heavy
Night Trucks (% of Total Volume)	0.3% Medium 6.1% Heavy	0.3% Medium 6.1% Heavy
Right-of-Way Width	45 meters	
Posted Speed Limit	80 km/h	

Please note:

1. The current volume is not the Annual Average Daily Traffic, but the averaged raw volumes over three data collection days. If you need the Annual Average Traffic Volume, please visit the Peel Open Data website below:
<http://opendata.peelregion.ca/data-categories/transportation/traffic-count-stations.aspx>
2. The ultimate volume is the planned volume during a level of service 'D' where a 2 second vehicle headway and a volume to capacity ratio of 0.9 is assumed. Traffic signals and hourly variations in traffic are also incorporated into the ultimate volume.

If you require further assistance, please contact me at (905) 791-7800 ext. 4810

Regards,

Viktoriya Zaytseva
 Transportation Analyst, Transportation System Planning
 Transportation Division, Public Works, Region of Peel
 10 Peel Centre Drive, Suite B, 4th Floor, Brampton, ON, L6T 4B9
 E: viktoriya.zaytseva@peelregion.ca • W: 905-791-7800 x4810

APPENDIX

C SAMPLE STAMSON OUTPUT

Filename: b.te Time Period: Day/Night 16/8 hours
Description: Lagerfeld Dr - Build Scenario

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

Car traffic volume : 19820/2476 veh/TimePeriod
Medium truck volume : 129/8 veh/TimePeriod
Heavy truck volume : 1456/162 veh/TimePeriod
Posted speed limit : 80 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: sbd_miss (day/night)

Angle1 Angle2 : -90.00 deg 30.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 72.00 / 72.00 m
Receiver height : 1.20 / 1.20 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 19820/2476 veh/TimePeriod
Medium truck volume : 129/8 veh/TimePeriod
Heavy truck volume : 1456/162 veh/TimePeriod
Posted speed limit : 80 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: nbd_miss (day/night)

Angle1 Angle2 : -90.00 deg 30.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 55.00 / 55.00 m
Receiver height : 1.20 / 1.20 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 27787/3087 veh/TimePeriod
Medium truck volume : 585/65 veh/TimePeriod
Heavy truck volume : 878/98 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 3: Lagerfeld (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 : 82.00 / 82.00 m
Receiver height : 1.20 / 1.20 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: sbd_miss (day)

Source height = 1.61 m

ROAD (0.00 + 60.07 + 0.00) = 60.07 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 30 0.66 74.23 0.00 -11.31 -2.85 0.00 0.00 0.00 60.07

Segment Leq : 60.07 dBA

Results segment # 2: nbd_miss (day)

Source height = 1.61 m

ROAD (0.00 + 62.01 + 0.00) = 62.01 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 30 0.66 74.23 0.00 -9.37 -2.85 0.00 0.00 0.00 62.01

Segment Leq : 62.01 dBA

Results segment # 3: Lagerfeld (day)

Source height = 1.32 m

ROAD (0.00 + 55.96 + 0.00) = 55.96 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.66 69.67 0.00 -12.25 -1.46 0.00 0.00 0.00 55.96

Segment Leq : 55.96 dBA

Total Leq All Segments: 64.77 dBA

Results segment # 1: sbd_miss (night)

Source height = 1.57 m

ROAD (0.00 + 53.65 + 0.00) = 53.65 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 30 0.66 67.81 0.00 -11.31 -2.85 0.00 0.00 0.00 53.65

Segment Leq : 53.65 dBA

Results segment # 2: nbd_miss (night)

Source height = 1.57 m

ROAD (0.00 + 55.59 + 0.00) = 55.59 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 30 0.66 67.81 0.00 -9.37 -2.85 0.00 0.00 0.00 55.59

Segment Leq : 55.59 dBA

Results segment # 3: Lagerfeld (night)

Source height = 1.32 m

ROAD (0.00 + 49.44 + 0.00) = 49.44 dBA

Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 90 0.66 63.15 0.00 -12.25 -1.46 0.00 0.00 0.00 49.44

Segment Leq : 49.44 dBA

Total Leq All Segments: 58.34 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 64.77
(NIGHT): 58.34

Filename: b_by.te Time Period: Day/Night 16/8 hours
Description: Lagerfeld Dr - Build Scenario (backyard)

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

Car traffic volume : 19820/2476 veh/TimePeriod
Medium truck volume : 129/8 veh/TimePeriod
Heavy truck volume : 1456/162 veh/TimePeriod
Posted speed limit : 80 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 1: sbd_miss (day/night)

Angle1 Angle2 : -90.00 deg -60.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 83.00 / 83.00 m
Receiver height : 1.20 / 1.20 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 19820/2476 veh/TimePeriod
Medium truck volume : 129/8 veh/TimePeriod
Heavy truck volume : 1456/162 veh/TimePeriod
Posted speed limit : 80 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 2: nbd_miss (day/night)

Angle1 Angle2 : -90.00 deg -60.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 66.00 / 66.00 m
Receiver height : 1.20 / 1.20 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

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

Car traffic volume : 27787/3087 veh/TimePeriod
Medium truck volume : 585/65 veh/TimePeriod
Heavy truck volume : 878/98 veh/TimePeriod
Posted speed limit : 50 km/h
Road gradient : 0 %
Road pavement : 1 (Typical asphalt or concrete)

Data for Segment # 3: Lagerfeld (day/night)

Angle1 Angle2 : -90.00 deg 30.00 deg
Wood depth : 0 (No woods.)
No of house rows : 0 / 0
Surface : 1 (Absorptive ground surface)
Receiver source distance : 98.00 / 98.00 m
Receiver height : 1.20 / 1.20 m
Topography : 1 (Flat/gentle slope; no barrier)
Reference angle : 0.00

Results segment # 1: sbd_miss (day)

Source height = 1.61 m
ROAD (0.00 + 50.00 + 0.00) = 50.00 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 -60 0.66 74.23 0.00 -12.33 -11.90 0.00 0.00 0.00 50.00

Segment Leq : 50.00 dBA

Results segment # 2: nbd_miss (day)

Source height = 1.61 m
ROAD (0.00 + 51.65 + 0.00) = 51.65 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 -60 0.66 74.23 0.00 -10.68 -11.90 0.00 0.00 0.00 51.65

Segment Leq : 51.65 dBA

Results segment # 3: Lagerfeld (day)

Source height = 1.32 m
ROAD (0.00 + 53.29 + 0.00) = 53.29 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 30 0.66 69.67 0.00 -13.53 -2.85 0.00 0.00 0.00 53.29

Segment Leq : 53.29 dBA

Total Leq All Segments: 56.62 dBA

Results segment # 1: sbd_miss (night)

Source height = 1.57 m
ROAD (0.00 + 43.58 + 0.00) = 43.58 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 -60 0.66 67.81 0.00 -12.33 -11.90 0.00 0.00 0.00 43.58

Segment Leq : 43.58 dBA

Results segment # 2: nbd_miss (night)

Source height = 1.57 m
ROAD (0.00 + 45.23 + 0.00) = 45.23 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 -60 0.66 67.81 0.00 -10.68 -11.90 0.00 0.00 0.00 45.23

Segment Leq : 45.23 dBA

Results segment # 3: Lagerfeld (night)

Source height = 1.32 m
ROAD (0.00 + 46.77 + 0.00) = 46.77 dBA
Angle1 Angle2 Alpha RefLeq P.Adj D.Adj F.Adj W.Adj H.Adj B.Adj SubLeq

-90 30 0.66 63.15 0.00 -13.53 -2.85 0.00 0.00 0.00 46.77

Segment Leq : 46.77 dBA

Total Leq All Segments: 50.16 dBA

TOTAL Leq FROM ALL SOURCES (DAY): 56.62
(NIGHT): 50.16