



**Tyoga Container Facility  
Noise Impact Study  
Water Street  
Village of Painted Post  
Steuben County, New York**

Prepared for:

**Tyoga Container Co.**

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## 2 Executive summary

A noise impact study was conducted to analyze the noise impacts of the proposed 600,000-square foot Tyoga Container Warehouse Facility at 450 West Water Street on the adjacent properties, and the noise impact of semi-trucks passing the properties located along the West Water Street access road both during the day and at night.

During daytime hours (7 AM to 10 PM), the facility would generate 82 truck passes at 100 percent buildout, 61.5 trucks at 75 percent buildout, and 41 trucks at 50 percent buildout. A maximum of 18 truck passes would occur during nighttime hours (10 PM to 7 AM).

This noise impact study was performed with adherence to guidelines provided by the Federal Transportation Administration (FTA), The Federal Highway Administration (FHWA), and noise measurements recorded along West Water Street.

The following conclusion are made from this report:

1. The proposed facility will replace the former Ingersoll-Rand Foundry Site. No manufacturing operations will occur at the site. Semi-truck traffic traveling along West Water Street access road is the only anticipated source of traffic noise activity.
2. Vibra-Tech Engineers (VTE) performed 24 hours of continuous noise monitoring at three locations along West Water Street on Thursday, August 13, 2020 at 12:00 PM, through Friday, August 14, 2020 at 12:00 PM. No semi-truck traffic was observed during this period, only passenger vehicles and two-axle work trucks. Existing noise levels resulting from traffic are below the Village of Painted Post allowable daytime (65 dBA) and nighttime (55 dBA) noise limits.
3. According to the Village of Painted Post Zoning Law, commercial traffic is exempt from the noise limits defined in the Zoning Law.
4. The proposed warehouse facility will create approximately 100 additional semi-truck passes along the West Water Street Access Road per day; 82 during daytime hours (7 AM to 10 PM) and 18 at night (10 PM to 7 AM) for 100 percent buildout.
5. Projected noise levels from the proposed truck traffic along Water Street at 25 feet will be in compliance to the Village of Painted Post daytime allowable noise limit of 65 dBA at 100, 75, and 50 percent buildout.

6. Projected noise levels from the proposed truck traffic (18 trucks per night) along West Water Street at 25 feet will be in compliance to the Village of Painted Post nighttime allowable noise limit of 55 dBA, as the projected total nighttime noise level is 54.5 dBA.
7. Based on the overall increase in LDN noise levels resulting from truck traffic at 25 feet, the increase in LDN of 0.9, 0.8, and 0.6 dBA for 100, 75, and 50 percent buildout is considered Moderate as per the FTA Traffic Noise Manual.

### 3 Objectives

VTE was retained by Tyoga Container Facility to perform this Noise Impact Study. This study was conducted based on:

- Noise Impact Guidelines provided by the Federal Transportation Administration and the Federal Highway Administration Traffic Noise Model (TNM 3.0).
- Field measurement of existing Water Street noise levels conducted by Vibra-Tech Engineers August 2020.
- Tyoga Container Facility Transportation Impact Study June 2020, Larson Design Group.

The following scope of work is provided for this project:

- Review site plans and the Transportation Impact Study.
- Measure existing ambient noise levels along West Water Street.
- Predict noise levels from semi-truck traffic at various locations along West Water Street.
- Compare predicted overall noise levels to the Village of Painted Post Noise Ordinance and FTA Noise Impact Guidelines
- Preparation of final noise impact analysis report.

## **4 Acoustical Terminology**

Sound levels are quantified by a variety of parameters and metrics. To aid the reader, this section introduces general concepts and terminology related to acoustics and environmental noise. The following related technical terms and criteria used for this project are summarized and outlined below:

### **4.1 Noise**

Noise is generally considered to be unwanted sound. Sound is what we hear when our ears are exposed to small pressure fluctuations in the air. There are many ways in which pressure fluctuations are generated, but typically they are caused by vibrating movement of a solid object. The terms 'noise' and 'sound' in this report are used interchangeably since there is no physical difference between them. Noise can be described in terms of three variables: amplitude (loud or soft), frequency (pitch); and time pattern (variability).

### **4.2 Sound Pressure Level ( $L_p$ )**

Loudness of a sound depends on the amplitude of the fluctuations above and below atmospheric pressure associated with a particular sound wave. The effective magnitude of the sound pressure in a sound wave can be expressed by the "root-mean-square" (rms) of the oscillating pressure measured in Pascals. The sound pressure level  $L_p$  has the units of decibels (dB).

### **4.3 Decibel (dB)**

The quietest sound that can be heard by most humans, the "threshold of hearing," is a sound pressure of about 20 microPascals, and the loudest sounds typically found in our environment range up to 20 million microPascals. Because of the difficulty in dealing with such an extreme range of numbers, acousticians use a compressed scale based on logarithms of the ratios of the sound energy contained in the wave related to the square of sound pressures instead of the sound pressures themselves, resulting in the "sound pressure level" in decibels (dB).

### **4.4 Frequency (Hz)**

Sound is a fluctuation of air pressure. The number of times the fluctuation occurs in one second is called its frequency. In acoustics, frequency is quantified in cycles per second, or Hertz (abbreviated Hz). Some sounds, like whistles, are associated with a single frequency; this type of sound is called a "pure tone." Most often, however, noise is made up of many frequencies, all blended. Human hearing covers the frequency range of 20 Hz to 20,000 Hz.

### **4.5 A-Weighted Sound Level (dBA)**

A frequency weighting that relates to the human ear. Humans have hearing that is most sensitive for soft tones in the mid-to high frequencies but less sensitive in the low frequencies; that is, hearing for soft tones "drops off" in the low frequencies. Sound level meters set to the A-weighting scale

will filter out much of the low-frequency noise they measure, like the response of the human ear. Noise measurements made with the A-weighting scale are designated “dBA”.

#### **4.6 $L_{Aeq}$ - Equivalent Continuous sound Level**

A steady noise level (weighted) which over a period has the same sound energy as the time varying noise.

#### **4.7 $L_{Aeq(1Hr)}$ - One Hour Equivalent continuous sound Level**

A steady noise level (weighted) which over a period of time has the same sound energy as the time varying noise.

#### **4.8 Day Level ( $L_d$ )**

Overall total noise level from 7:00 AM to 10:00 PM

#### **4.9 Night Level ( $L_n$ )**

Overall total noise level from 10:00 PM to 7:00 AM

#### **4.10 Level Day/Night (LDN)**

Overall 24 hour noise level measured over a 24 hour period with a 10 dB penalty (+10dB) added to night time hourly Leq values from 10:00 PM to 7:00 AM

## **5 Noise Impact Criteria**

### **5.1 Village of Painted Post, New York Noise Criteria**

Based on the Village of Painted Post Zoning Law, the limits for continuous airborne noise are 65 dBA ( $L_d$ ) during daytime hours (7:00 AM to 10:00 PM) and 55 dBA ( $L_n$ ) during nighttime hours (10:00 PM to 7:00 AM). It should be noted that noise from commercial traffic is exempt from the noise limits defined in the Village of Painted Post Zoning Law.

### **5.2 Federal Transportation Administration (FTA) Noise Impact Criteria**

As per the FTA Option A –The methods described for Transit Noise due to new traffic noise sources, with no changes to the existing road were followed. The Residential Land Use Category 2 – Outdoor LDN noise parameter was used for noise at the nearest building façade. Ambient noise levels were compared to the calculated and modeled truck noise levels as suggested by FTA methods to determine the potential noise impact along West Water Street.

Utilizing the equations provided in the FTA Traffic Noise and Vibration Assessment Manual's Table 4-23 below, VTE calculated the overall  $L_d$ ,  $L_n$ , and Level Day/Night (LDN) noise levels for comparison to both the Village of Post Noise Ordinance and the FTA suggested limits.

For these calculations, distances of 25 and 50 feet were used with no adjustments. The equation variables are as follows:

**$V = 106$**

**$V_d = 5.5$  Trucks at 100 percent, 4.1 Trucks at 75 percent, and 2.8 Trucks at 50 percent**

**$V_n = 2$  Trucks**

**$S = 20$**

Table 4-23 Computation of $L_{eq(1hr)}$ and $L_{dn}$ at 50 ft: Highway/Transit Sources		
<b><math>L_{eq(1hr)}</math> at 50 ft</b>	$L_{eq(1hr)} = SEL_{ref} + 10 \log(V) + C_{emissions} - 10 \log\left(\frac{S}{50}\right) - 35.6$	<b>Eq. 4-34</b>
<b>Daytime <math>L_d</math> at 50 ft</b>	$L_d = L_{eq(1hr)}$ where $V = V_d$	<b>Eq. 4-35</b>
<b>Nighttime <math>L_n</math> at 50 ft</b>	$L_n = L_{eq(1hr)}$ where $V = V_n$	<b>Eq. 4-36</b>
<b><math>L_{dn}</math> at 50 ft</b>	$L_{dn} = 10 \log(15 \times 10^{(L_d/10)} + 9 \times 10^{((L_n+10)/10)}) - 13.8$	<b>Eq. 4-37</b>
<b>Adjustments</b>	$= -3$ for automobiles, open-graded asphalt $= +3$ for automobiles, grooved pavement	
	$V$ = average hourly volume of vehicles, vehicles per hour  $C_{emissions}$ = $25 \log\left(\frac{S}{50}\right)$ for buses $31 \log\left(\frac{S}{50}\right)$ for hybrid buses <sup>(23)</sup> $1.6$ for accelerating 3-axle commuter buses $40 \log\left(\frac{S}{50}\right)$ for automobiles  $S$ = average vehicle speed, mph (distance divided by time, excluding stop time at red lights)  $V_d$ = average hourly daytime volume of vehicles of this type, vehicles per hour $= \frac{\text{total vehicle volume, 7 a.m. to 10 p.m.}}{15}$  $V_n$ = average hourly nighttime volume of vehicles, vehicles per hour $= \frac{\text{total vehicle volume, 10 p.m. to 7 a.m.}}{9}$	

### 5.3 Modeled Truck Traffic Noise – FHWA Traffic Noise Model 3.0

Projected noise levels for the increase truck traffic volume were also determined using the FHWA Traffic Noise Model (TNM 3.0). These projected levels were also compared to the Village of Painted Post noise limits and the FTA suggested limits. The TNM input parameters included average road conditions, truck speed of 20 mph, truck traffic volume (5.5 at 100 %, 4.1 at 75%, and 2.8 at 50%) during the day (7 AM to 10 PM) and 2 trucks per hour at night (10 PM to 7 AM). A total of 10 noise receiver locations were used to model noise at 10 residential buildings along West Water Street. These receivers were modeled at a distance of approximately 25 feet from the edge of the road. Figure 1 below shows modeled noise receiver locations along West Water Street.

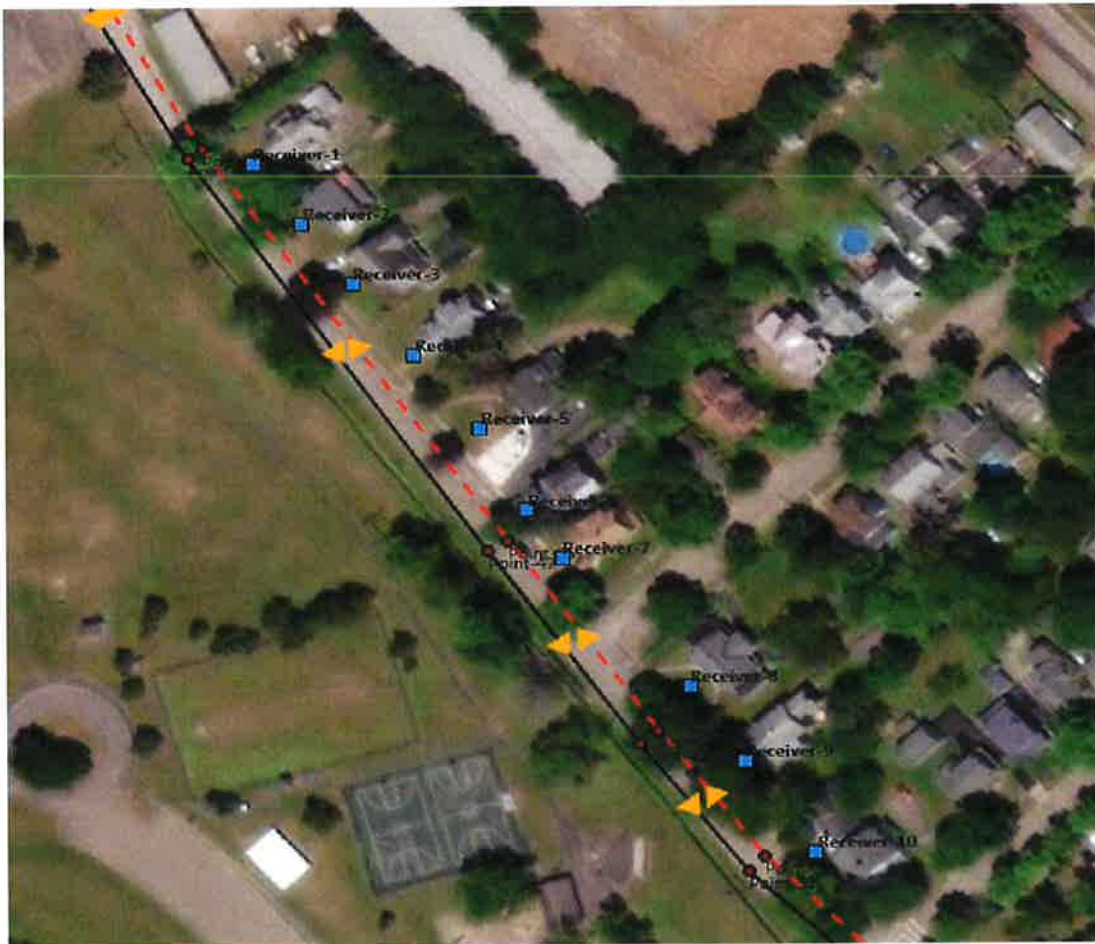


Figure 1. Noise receiver locations along West Water Street used in the Traffic Noise Model to predict truck noise.

## 6 Existing Noise Monitoring Procedure

Representatives of VTE performed 24 hours of continuous ambient noise monitoring at three locations along West Water Street on Thursday, August 13, 2020 12:00 PM through Friday August 14, 2020 12:00 PM.

The monitoring locations are shown in Figure 2. The noise levels measured at each location consisted of the 1 hour equivalent sound level ( $L_{eq}$ ) dBA. The overall continuous daytime ( $L_d$ ) and nighttime ( $L_n$ ) were then calculated using the 1 hour  $L_{eq}$  measurements. All noise levels were measured using Larson Davis Type I integrating sound level meters. These meters were factory calibrated within the past year, with a field calibration check performed at the beginning and end of the study.

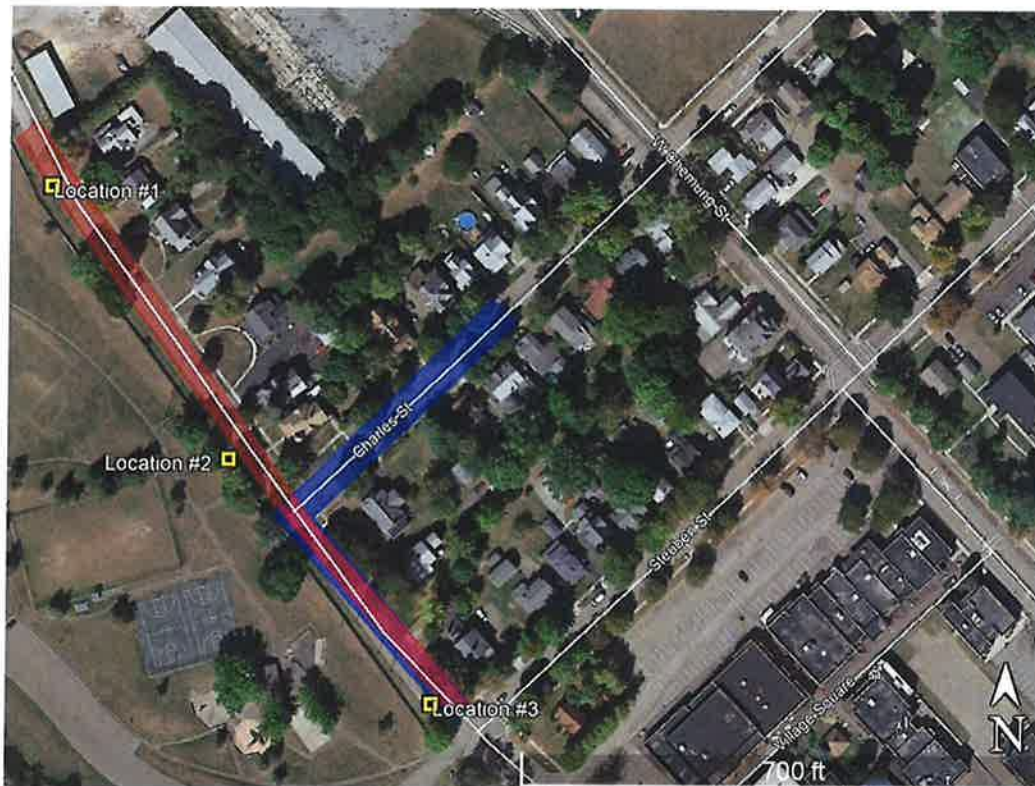


Figure 1. Ambient Noise Monitoring Locations (Water Street)

## 6.1 Existing Ambient Noise Monitoring Results

Based on 24 hours of monitoring at 3 locations along West Water Street, VTE calculated the  $L_d$ ,  $L_n$  and (LDN) for each location utilizing the measured 1-hour  $L_{eq}$  noise levels. T should be noted that the LDN calculation includes a 10 dB penalty applied during the hours of 10 PM to 7 AM. This data has been summarized in Table 1 below. All sound level data summaries are provided in Appendix A.

**Table 1. Summary of 24-hour  $L_d$ ,  $L_n$ , and LDN ambient noise levels measured at 3 locations on West Water Street on August 13 and 14, 2020.**

Location Water Street	$L_d$ (dBA)	$L_n$ (dBA)	LDN (dBA)
1	54.9	52.9	63.6
2	53.1	50.9	61.6
3	56.8	52.0	63.2
LEQ	55.2	52.0	62.9

## 6.2 Predicted Truck Noise Levels During Warehouse Operation

### 6.2.1 Calculated Noise Levels Using FTA

Utilizing the equations provided in Table 4.23 from the FTA manual, VTE calculated the  $L_d$ ,  $L_n$ , and LDN noise levels from the contribution of the proposed truck traffic on West Water Street. Based on information obtained from the Transportation Impact Study and Tyoga Container, we used the following information for these calculations:

- Total trucks per 24 hours of 100, 79.5, and 59; representing 100, 75, and 50 percent buildout
- 82 trucks per day (5.5 per hour at 100%)
- 61.5 trucks per day (4.1 per hour at 75%)
- 41 trucks per day (2.8 per hour at 50%)
- 18 trucks at night (2 Trucks per hour regardless of percent buildout)

The results of these calculations are summarized in Tables 2.

**Table 2. Calculated truck noise utilizing equations in Table 4-23 of the FTA Guideline at 25 and 50 feet from the edge of West Water Street.**

Percent Buildout	Location	L <sub>d</sub> (dBA)	L <sub>n</sub> (dBA)	LDN (dBA)
100 %	Water Street 25'	55.3	51.0	56.7
100 %	Water Street 50'	50.8	46.4	52.1
75 %	Water Street 25'	54.1	51.0	55.8
75 %	Water Street 50'	49.6	46.4	51.3
50 %	Water Street 25'	52.5	51.0	54.8
50 %	Water Street 50'	47.9	46.4	50.2

### 6.2.2 Predicted using FHWA Traffic Noise Model 3.0

In addition to calculating the proposed truck traffic noise, VTE also utilized the FHWA traffic noise model. A summary of the model results is provided in Table 3 showing the maximum predicted level for L<sub>d</sub>, L<sub>n</sub>, and LDN for 100, 75, and 50 percent buildout. The model output table are included as Appendix B.

**Table 3. Maximum L<sub>d</sub>, L<sub>n</sub>, and LDN predicted truck noise levels along West Water Street utilizing the FHWA Traffic Noise Model (TNM3.0).**

Percent Buildout	Location	L <sub>d</sub> (dBA)	L <sub>n</sub> (dBA)	LDN (dBA)
100 %	Water Street 25'	55.7	51.3	57.0
75 %	Water Street 25'	54.4	51.3	56.1
50 %	Water Street 25'	52.8	51.3	55.1

A comparison of calculated and modeled noise levels at 25 feet from the edge of West Water Street provided in Tables 2 and 3 indicates both methods of estimating truck traffic yield similar predicted noise levels as a result of the proposed truck traffic.

## 7 Conclusion

### Impact Assessment - Existing Ambient plus proposed truck noise at 25 feet

In order to complete the truck noise impact assessment, the change or increase in overall noise levels due to the proposed truck traffic was calculated. This was completed by comparing the existing ambient noise level measured along West Water Street to the results of the TNM predictions for additional truck noise. Based on this comparison, the total noise and the increase to existing noise could be determined. A summary of this data appears in Tables 4 through 6.

To determine the potential truck noise impact, VTE followed the FTA suggested guidelines, FTA Option A -Transit noise due to new traffic noise sources, with no changes to the existing road. The Residential Land Use Category 2 – Outdoor LDN noise parameter was used for noise at the nearest building façade. The FTA impact assessment criteria used for Option A are Figure 4-2 and Table 4-5 shown below.

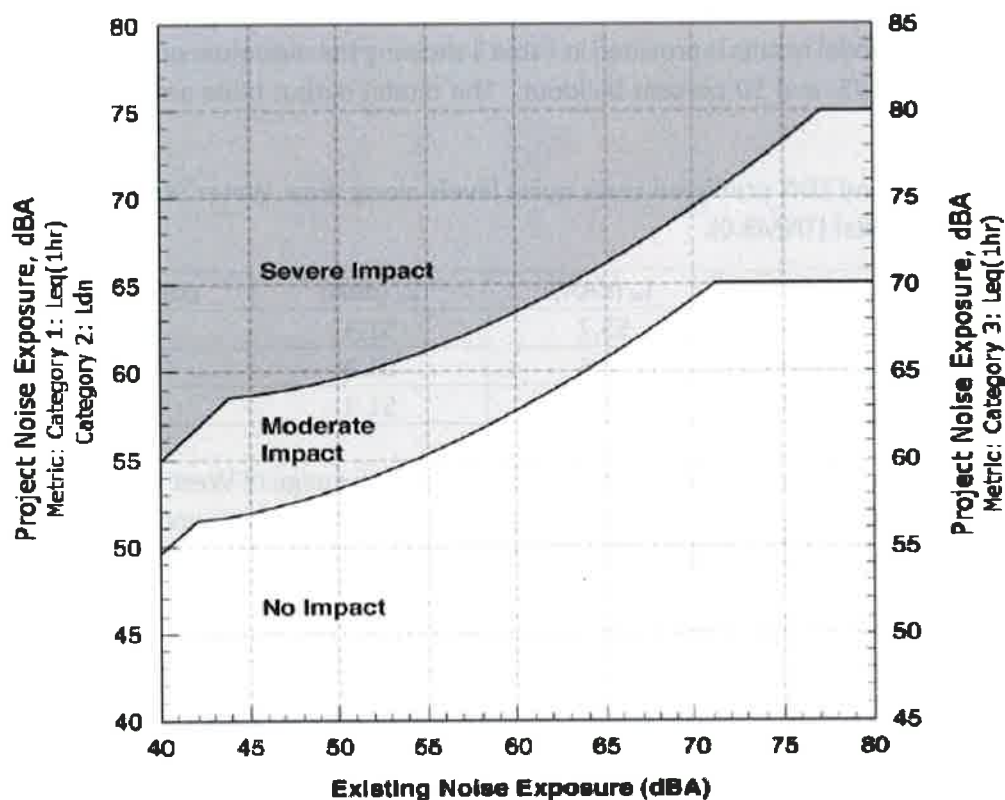


Figure 4-2 Noise Impact Criteria for Transit Projects

Table 4-5 Noise Levels Defining Impact for Transit Projects

Existing Noise Exposure, dBA	Project Noise Impact Exposure, dBA					
	Category 1 ( $L_{eq}(1hr)$ ) or 2 ( $L_{dn}$ ) Sites			Category 3 Sites ( $L_{eq}(1hr)$ )		
$L_{eq}(1hr)$ or $L_{dn}$	No Impact	Moderate Impact	Severe Impact	No Impact	Moderate Impact	Severe Impact
<43	< Ambient+10	Ambient +10 to 15	> Ambient+15	< Ambient+15	Ambient +15 to 20	> Ambient+20
43	<52	52-58	>58	<57	57-63	>63
44	<52	52-58	>58	<57	57-63	>63
45	<52	52-58	>58	<57	57-63	>63
46	<53	53-59	>59	<58	58-64	>64
47	<53	53-59	>59	<58	58-64	>64
48	<53	53-59	>59	<58	58-64	>64
49	<54	54-59	>59	<59	59-64	>64
50	<54	54-59	>59	<59	59-64	>64
51	<54	54-60	>60	<59	59-65	>65
52	<55	55-60	>60	<60	60-65	>65
53	<55	55-60	>60	<60	60-65	>65
54	<55	55-61	>61	<60	60-66	>66
55	<56	56-61	>61	<61	61-66	>66
56	<56	56-62	>62	<61	61-67	>67
57	<57	57-62	>62	<62	62-67	>67
58	<57	57-62	>62	<62	62-67	>67
59	<58	58-63	>63	<63	63-68	>68
60	<58	58-63	>63	<63	63-68	>68
61	<59	59-64	>64	<64	64-69	>69
62	<59	59-64	>64	<64	64-69	>69
63	<60	60-65	>65	<65	65-70	>70
64	<61	61-65	>65	<66	66-70	>70
65	<61	61-66	>66	<66	66-71	>71
66	<62	62-67	>67	<67	67-72	>72
67	<63	63-67	>67	<68	68-72	>72
68	<63	63-68	>68	<68	68-73	>73
69	<64	64-69	>69	<69	69-74	>74
70	<65	65-69	>69	<70	70-74	>74
71	<66	66-70	>70	<71	71-75	>75
72	<66	66-71	>71	<71	71-76	>76
73	<66	66-71	>71	<71	71-76	>76
74	<66	66-72	>72	<71	71-77	>77
75	<66	66-73	>73	<71	71-78	>78
76	<66	66-74	>74	<71	71-79	>79
77	<66	66-74	>74	<71	71-79	>79
>77	<66	66-75	>75	<71	71-80	>80

**Table 4. Summary of measured ambient, predicted truck noise at 100 percent buildout, and total noise on West Water Street.**

Location	LDay (dBA)	LNight (dBA)	LDN (dBA)
Water Street Existing Noise	55.2	52.0	62.9
TNM – West Water Street Additional Truck Noise – 25 Feet	55.3	51.0	56.7
<b>Total Noise</b>	<b>58.3</b>	<b>54.5</b>	<b>63.8</b>
<b>Increase to Existing Noise</b>	<b>+3.1</b>	<b>+2.5</b>	<b>+0.9</b>

**Table 5. Summary of measured ambient, predicted truck noise at 75 percent buildout, and total noise on West Water Street.**

Location	LDay (dBA)	LNight (dBA)	LDN (dBA)
Water Street Existing Noise	55.2	52.0	62.9
TNM-Water Street Additional Truck Noise – 25 Feet	54.1	51.0	55.8
<b>Total Noise</b>	<b>57.7</b>	<b>54.5</b>	<b>63.7</b>
<b>Increase to Existing Noise</b>	<b>+2.5</b>	<b>+2.5</b>	<b>+0.8</b>

**Table 6. Summary of measured ambient, predicted truck noise at 50 percent buildout, and total noise on West Water Street.**

Location	LDay (dBA)	LNight (dBA)	LDN (dBA)
Water Street Existing Noise	55.2	52.0	62.9
TNM-Water Street Additional Truck Noise – 25 Feet	52.5	51.0	54.8
Total Noise	57.1	54.5	63.5
Increase to Existing Noise	+1.9	+2.5	+0.6

The Village of Painted Post limits for continuous airborne noise are 65 dBA ( $L_d$ ) during daytime hours (7:00 AM to 10:00 PM) and 55 dBA ( $L_n$ ) during nighttime hours (10:00 PM to 7:00 AM). It should be noted that noise from commercial traffic is listed as an exemption from the noise limits defined in the Village of Painted Post Zoning Law.

The total combined daytime ( $L_d$ ) noise for 100, 75, and 50 percent buildout are 58.3, 57.7, and 57.1 respectively, considering the existing ambient noise plus the additional proposed truck noise. These levels are all below the daytime limit of 65 dBA ( $L_d$ ). Please refer to Tables 4 through 6. The total nighttime ( $L_n$ ) noise from existing ambient plus additional proposed truck noise is 54.8. This level is below the nighttime 55 dBA limit.

Projections were performed based on the methods described for Transit Noise due to new traffic noise sources, with no changes to the existing road. Considering the Residential Land Use Category 2, and the Outdoor LDN noise parameter at the nearest building façade, an increase in LDN of +0.9 dBA for 100 percent buildout, +0.8 dBA for 75 buildout, and +0.6 dBA for 50 percent buildout, due to the proposed truck traffic would all be considered a Moderate Impact as per Figure 4-2 and Table 4-5 of the FTA Traffic Noise and Assessment Manual.

Respectfully Submitted,

**Vibra-Tech Engineers, Inc.**



Ethan Huff  
Project Manager



Jonathan A. Ferdinand  
Noise and Vibration Specialist

## **8 Appendix A - Sound Level Data Measured along West Water Street**

	Location 1 s/n 1595	Location 2 s/n 6144	Location 3 s/n 1596
Hour	LEQ	LEQ	LEQ
12:00	51.9	52.6	55.6
13:00	57.3	55.4	58.6
14:00	54	52.9	56.7
15:00	53.8	54.2	60.6
16:00	52.5	52.1	55.1
17:00	52.9	53.2	58
18:00	61.1	55	57.6
19:00	51.3	50.9	55.5
20:00	53.8	52.2	54.4
21:00	55.7	52.7	54
22:00	54.6	51.7	52.6
23:00	52.7	50.3	51.2
0:00	52	49.4	49.9
1:00	51.8	49.1	49
2:00	50.9	48.8	48.7
3:00	50.8	49.7	49
4:00	52	50.9	50.8
5:00	53.8	52.1	52.9
6:00	55.2	53.7	56.8
7:00	53.6	52.4	56.1
8:00	53.7	52.4	55.4
9:00	52.4	52	55.4
10:00	54	53.6	57.3
11:00	53.2	52.6	55.7
<b>LEQ- Day</b>	<b>54.9</b>	<b>53.2</b>	<b>57</b>
<b>LEQ- Night</b>	<b>53.3</b>	<b>51.2</b>	<b>52.5</b>
<b>LDN</b>	<b>59.8</b>	<b>58.7</b>	<b>60.5</b>

## **9 Appendix B - Results of Traffic Noise Model**

## L<sub>Aeq</sub> Daytime (50% buildout)

REPORT:	Results: Sound Levels Diagnosis By Vehicle Type - Input Heights		
TNM VERSION:	3.0.7.60002	REPORT DATE:	16 October 2020
CALCULATED WITH:	3.0.7.60002	CALCULATION DATE:	10/16/2020 11:55:18 AM
CASE:	Tyoga_Ld	ORGANIZATION:	Vibra-Tech Engineers, Inc.
ANALYSIS BY:	Siavash Mahvelati, Ph.D.	PROJECT/CONTRACT:	Tyoga Container Company (Sound and Vibration Study)
ATMOSPHERICS:	70°F, 50%	DEFAULT GROUND TYPE:	HardSoil

Selected Receivers		Total	Vehicle Type	Partial
Name	No.	L <sub>Aeq</sub>	Name	L <sub>Aeq</sub>
		dBA		dBA
Receiver-1	1	52.8	HeavyTrucks	52.8
Receiver-2	2	52.6	HeavyTrucks	52.6
Receiver-3	3	52.1	HeavyTrucks	52.1
Receiver-4	4	51.3	HeavyTrucks	51.3
Receiver-5	5	50.6	HeavyTrucks	50.6
Receiver-6	6	52.4	HeavyTrucks	52.4
Receiver-7	7	52.7	HeavyTrucks	52.7
Receiver-8	8	50.1	HeavyTrucks	50.1
Receiver-9	9	50.7	HeavyTrucks	50.7
Receiver-10	10	51.8	HeavyTrucks	51.8

## L<sub>Aeq</sub> Daytime (75% buildout)

REPORT:	Results: Sound Levels Diagnosis By Vehicle Type - Input Heights		
TNM VERSION:	3.0.7.60002	REPORT DATE:	16 October 2020
CALCULATED WITH:	3.0.7.60002	CALCULATION DATE:	10/16/2020 11:53:48 AM
CASE:	Tyoga_Ld	ORGANIZATION:	Vibra-Tech Engineers, Inc.
ANALYSIS BY:	Siavash Mahvelati, Ph.D.	PROJECT/CONTRACT:	Tyoga Container Company (Sound and Vibration Study)
ATMOSPHERICS:	70°F, 50%	DEFAULT GROUND TYPE:	HardSoil

Selected Receivers		Total	Vehicle Type	Partial
Name	No.	L <sub>Aeq</sub>	Name	L <sub>Aeq</sub>
		dBA		dBA
Receiver-1	1	54.4	HeavyTrucks	54.4
Receiver-2	2	54.2	HeavyTrucks	54.2
Receiver-3	3	53.8	HeavyTrucks	53.8
Receiver-4	4	53.0	HeavyTrucks	53.0
Receiver-5	5	52.3	HeavyTrucks	52.3
Receiver-6	6	54.0	HeavyTrucks	54.0
Receiver-7	7	54.4	HeavyTrucks	54.4
Receiver-8	8	51.7	HeavyTrucks	51.7
Receiver-9	9	52.4	HeavyTrucks	52.4
Receiver-10	10	53.5	HeavyTrucks	53.5

## LAeq Daytime (100% buildout)

REPORT: Results: Sound Levels Diagnosis By Vehicle Type - Input Heights  
TNM VERSION: 3.0.7.60002 REPORT DATE: 16 October 2020  
CALCULATED WITH: 3.0.7.60002 CALCULATION DATE: 10/16/2020 11:50:27 AM  
CASE: Tyoga\_Ld ORGANIZATION: Vibra-Tech Engineers, Inc.  
ANALYSIS BY: Siavash Mahvelati, Ph.D. PROJECT/CONTRACT: Tyoga Container Company (Sound and Vibration Study)  
ATMOSPHERICS: 70°F, 50% DEFAULT GROUND TYPE: HardSoil

Selected Receivers		Total LAeq dBA	Vehicle Type Name	Partial LAeq dBA
Name	No.			
Receiver-1	1	55.7	HeavyTrucks	55.7
Receiver-2	2	55.5	HeavyTrucks	55.5
Receiver-3	3	55.0	HeavyTrucks	55.0
Receiver-4	4	54.3	HeavyTrucks	54.3
Receiver-5	5	53.5	HeavyTrucks	53.5
Receiver-6	6	55.3	HeavyTrucks	55.3
Receiver-7	7	55.6	HeavyTrucks	55.6
Receiver-8	8	53.0	HeavyTrucks	53.0
Receiver-9	9	53.6	HeavyTrucks	53.6
Receiver-10	10	54.7	HeavyTrucks	54.7

## LAeq Nighttime

REPORT:	Results: Sound Levels Diagnosis By Vehicle Type - Input Heights		
TNM VERSION:	3.0.7.60002	REPORT DATE:	16 October 2020
CALCULATED WITH:	3.0.7.60002	CALCULATION DATE:	10/16/2020 1:39:11 PM
CASE:	Tyoga_Ld	ORGANIZATION:	Vibra-Tech Engineers, Inc.
ANALYSIS BY:	Siavash Mahvelati, Ph.D.	PROJECT/CONTRACT:	Tyoga Container Company (Sound and Vibration Study)
ATMOSPHERICS:	70°F, 50%	DEFAULT GROUND TYPE:	HardSoil

Selected Receivers		Total LAeq dBA	Vehicle Type Name	Partial LAeq dBA
Name	No.			
Receiver-1	1	51.3	HeavyTrucks	51.3
Receiver-2	2	51.1	HeavyTrucks	51.1
Receiver-3	3	50.7	HeavyTrucks	50.7
Receiver-4	4	49.9	HeavyTrucks	49.9
Receiver-5	5	49.1	HeavyTrucks	49.1
Receiver-6	6	50.9	HeavyTrucks	50.9
Receiver-7	7	51.2	HeavyTrucks	51.2
Receiver-8	8	48.6	HeavyTrucks	48.6
Receiver-9	9	49.2	HeavyTrucks	49.2
Receiver-10	10	50.3	HeavyTrucks	50.3

