

Appendix I

Noise Measurement and Analyses Data

Freq Weight : A
Time Weight : SLOW
Level Range : 40-100
Max dB : 78.7 - 2019/03/25 17: 31: 08
Level Range : 40-100
SEL : 93.9
Leq : 66.2

| No. s | Date Time | (dB) |
|-------|-----------------------|------|
| 1 | 2019/03/25 17: 28: 17 | 69.5 |
| 2 | 2019/03/25 17: 28: 20 | 68.5 |
| 3 | 2019/03/25 17: 28: 23 | 61.7 |
| 4 | 2019/03/25 17: 28: 26 | 63.4 |
| 5 | 2019/03/25 17: 28: 29 | 61.4 |
| 6 | 2019/03/25 17: 28: 32 | 55.4 |
| 7 | 2019/03/25 17: 28: 35 | 51.3 |
| 8 | 2019/03/25 17: 28: 38 | 48.3 |
| 9 | 2019/03/25 17: 28: 41 | 47.0 |
| 10 | 2019/03/25 17: 28: 44 | 51.1 |
| 11 | 2019/03/25 17: 28: 47 | 68.0 |
| 12 | 2019/03/25 17: 28: 50 | 70.2 |
| 13 | 2019/03/25 17: 28: 53 | 68.7 |
| 14 | 2019/03/25 17: 28: 56 | 64.4 |
| 15 | 2019/03/25 17: 28: 59 | 66.3 |
| 16 | 2019/03/25 17: 29: 02 | 60.0 |
| 17 | 2019/03/25 17: 29: 05 | 56.7 |
| 18 | 2019/03/25 17: 29: 08 | 68.1 |
| 19 | 2019/03/25 17: 29: 11 | 68.5 |
| 20 | 2019/03/25 17: 29: 14 | 63.5 |
| 21 | 2019/03/25 17: 29: 17 | 63.8 |
| 22 | 2019/03/25 17: 29: 20 | 67.5 |
| 23 | 2019/03/25 17: 29: 23 | 67.1 |
| 24 | 2019/03/25 17: 29: 26 | 68.8 |
| 25 | 2019/03/25 17: 29: 29 | 68.0 |
| 26 | 2019/03/25 17: 29: 32 | 66.6 |
| 27 | 2019/03/25 17: 29: 35 | 66.1 |
| 28 | 2019/03/25 17: 29: 38 | 68.3 |
| 29 | 2019/03/25 17: 29: 41 | 64.4 |
| 30 | 2019/03/25 17: 29: 44 | 63.4 |
| 31 | 2019/03/25 17: 29: 47 | 61.6 |
| 32 | 2019/03/25 17: 29: 50 | 59.9 |
| 33 | 2019/03/25 17: 29: 53 | 53.7 |
| 34 | 2019/03/25 17: 29: 56 | 47.4 |
| 35 | 2019/03/25 17: 29: 59 | 45.5 |
| 36 | 2019/03/25 17: 30: 02 | 44.9 |
| 37 | 2019/03/25 17: 30: 05 | 46.6 |
| 38 | 2019/03/25 17: 30: 08 | 54.9 |
| 39 | 2019/03/25 17: 30: 11 | 65.7 |
| 40 | 2019/03/25 17: 30: 14 | 64.8 |
| 41 | 2019/03/25 17: 30: 17 | 61.3 |
| 42 | 2019/03/25 17: 30: 20 | 60.5 |
| 43 | 2019/03/25 17: 30: 23 | 59.7 |
| 44 | 2019/03/25 17: 30: 26 | 58.0 |
| 45 | 2019/03/25 17: 30: 29 | 68.6 |
| 46 | 2019/03/25 17: 30: 32 | 69.0 |
| 47 | 2019/03/25 17: 30: 35 | 62.0 |
| 48 | 2019/03/25 17: 30: 38 | 65.8 |
| 49 | 2019/03/25 17: 30: 41 | 73.0 |
| 50 | 2019/03/25 17: 30: 44 | 70.3 |
| 51 | 2019/03/25 17: 30: 47 | 62.7 |
| 52 | 2019/03/25 17: 30: 50 | 63.7 |
| 53 | 2019/03/25 17: 30: 53 | 65.6 |
| 54 | 2019/03/25 17: 30: 56 | 68.7 |
| 55 | 2019/03/25 17: 30: 59 | 69.8 |
| 56 | 2019/03/25 17: 31: 02 | 65.4 |
| 57 | 2019/03/25 17: 31: 05 | 78.5 |
| 58 | 2019/03/25 17: 31: 08 | 69.2 |
| 59 | 2019/03/25 17: 31: 11 | 60.0 |
| 60 | 2019/03/25 17: 31: 14 | 61.6 |
| 61 | 2019/03/25 17: 31: 17 | 65.3 |
| 62 | 2019/03/25 17: 31: 20 | 64.2 |
| 63 | 2019/03/25 17: 31: 23 | 61.9 |
| 64 | 2019/03/25 17: 31: 26 | 58.0 |
| 65 | 2019/03/25 17: 31: 29 | 62.5 |
| 66 | 2019/03/25 17: 31: 32 | 64.9 |
| 67 | 2019/03/25 17: 31: 35 | 66.3 |
| 68 | 2019/03/25 17: 31: 38 | 63.4 |
| 69 | 2019/03/25 17: 31: 41 | 70.2 |
| 70 | 2019/03/25 17: 31: 44 | 67.1 |
| 71 | 2019/03/25 17: 31: 47 | 70.8 |
| 72 | 2019/03/25 17: 31: 50 | 65.8 |
| 73 | 2019/03/25 17: 31: 53 | 69.1 |
| 74 | 2019/03/25 17: 31: 56 | 66.5 |
| 75 | 2019/03/25 17: 31: 59 | 62.2 |
| 76 | 2019/03/25 17: 32: 02 | 71.0 |
| 77 | 2019/03/25 17: 32: 05 | 68.6 |
| 78 | 2019/03/25 17: 32: 08 | 69.0 |
| 79 | 2019/03/25 17: 32: 11 | 65.7 |
| 80 | 2019/03/25 17: 32: 14 | 65.1 |
| 81 | 2019/03/25 17: 32: 17 | 68.4 |
| 82 | 2019/03/25 17: 32: 20 | 66.1 |
| 83 | 2019/03/25 17: 32: 23 | 67.8 |
| 84 | 2019/03/25 17: 32: 26 | 62.5 |
| 85 | 2019/03/25 17: 32: 29 | 63.1 |

| | | | |
|-----|------------|----------|------|
| 86 | 2019/03/25 | 17:32:32 | 67.2 |
| 87 | 2019/03/25 | 17:32:35 | 62.1 |
| 88 | 2019/03/25 | 17:32:38 | 58.9 |
| 89 | 2019/03/25 | 17:32:41 | 64.4 |
| 90 | 2019/03/25 | 17:32:44 | 59.4 |
| 91 | 2019/03/25 | 17:32:47 | 64.6 |
| 92 | 2019/03/25 | 17:32:50 | 67.8 |
| 93 | 2019/03/25 | 17:32:53 | 61.7 |
| 94 | 2019/03/25 | 17:32:56 | 67.7 |
| 95 | 2019/03/25 | 17:32:59 | 65.7 |
| 96 | 2019/03/25 | 17:33:02 | 68.3 |
| 97 | 2019/03/25 | 17:33:05 | 63.7 |
| 98 | 2019/03/25 | 17:33:08 | 65.0 |
| 99 | 2019/03/25 | 17:33:11 | 68.0 |
| 100 | 2019/03/25 | 17:33:14 | 69.0 |
| 101 | 2019/03/25 | 17:33:17 | 67.5 |
| 102 | 2019/03/25 | 17:33:20 | 69.5 |
| 103 | 2019/03/25 | 17:33:23 | 68.0 |
| 104 | 2019/03/25 | 17:33:26 | 65.1 |
| 105 | 2019/03/25 | 17:33:29 | 68.5 |
| 106 | 2019/03/25 | 17:33:32 | 69.1 |
| 107 | 2019/03/25 | 17:33:35 | 62.0 |
| 108 | 2019/03/25 | 17:33:38 | 59.3 |
| 109 | 2019/03/25 | 17:33:41 | 66.4 |
| 110 | 2019/03/25 | 17:33:44 | 59.9 |
| 111 | 2019/03/25 | 17:33:47 | 55.9 |
| 112 | 2019/03/25 | 17:33:50 | 56.9 |
| 113 | 2019/03/25 | 17:33:53 | 61.1 |
| 114 | 2019/03/25 | 17:33:56 | 56.5 |
| 115 | 2019/03/25 | 17:33:59 | 60.2 |
| 116 | 2019/03/25 | 17:34:02 | 68.4 |
| 117 | 2019/03/25 | 17:34:05 | 64.5 |
| 118 | 2019/03/25 | 17:34:08 | 63.9 |
| 119 | 2019/03/25 | 17:34:11 | 66.1 |
| 120 | 2019/03/25 | 17:34:14 | 68.0 |
| 121 | 2019/03/25 | 17:34:17 | 62.2 |
| 122 | 2019/03/25 | 17:34:20 | 70.4 |
| 123 | 2019/03/25 | 17:34:23 | 68.5 |
| 124 | 2019/03/25 | 17:34:26 | 69.7 |
| 125 | 2019/03/25 | 17:34:29 | 69.2 |
| 126 | 2019/03/25 | 17:34:32 | 61.7 |
| 127 | 2019/03/25 | 17:34:35 | 66.6 |
| 128 | 2019/03/25 | 17:34:38 | 60.5 |
| 129 | 2019/03/25 | 17:34:41 | 67.5 |
| 130 | 2019/03/25 | 17:34:44 | 71.0 |
| 131 | 2019/03/25 | 17:34:47 | 65.2 |
| 132 | 2019/03/25 | 17:34:50 | 72.1 |
| 133 | 2019/03/25 | 17:34:53 | 70.0 |
| 134 | 2019/03/25 | 17:34:56 | 63.4 |
| 135 | 2019/03/25 | 17:34:59 | 57.0 |
| 136 | 2019/03/25 | 17:35:02 | 52.6 |
| 137 | 2019/03/25 | 17:35:05 | 66.9 |
| 138 | 2019/03/25 | 17:35:08 | 64.0 |
| 139 | 2019/03/25 | 17:35:11 | 58.9 |
| 140 | 2019/03/25 | 17:35:14 | 56.8 |
| 141 | 2019/03/25 | 17:35:17 | 60.9 |
| 142 | 2019/03/25 | 17:35:20 | 52.4 |
| 143 | 2019/03/25 | 17:35:23 | 46.1 |
| 144 | 2019/03/25 | 17:35:26 | 48.4 |
| 145 | 2019/03/25 | 17:35:29 | 66.1 |
| 146 | 2019/03/25 | 17:35:32 | 63.1 |
| 147 | 2019/03/25 | 17:35:35 | 56.7 |
| 148 | 2019/03/25 | 17:35:38 | 61.9 |
| 149 | 2019/03/25 | 17:35:41 | 69.5 |
| 150 | 2019/03/25 | 17:35:44 | 69.2 |
| 151 | 2019/03/25 | 17:35:47 | 69.1 |
| 152 | 2019/03/25 | 17:35:50 | 67.7 |
| 153 | 2019/03/25 | 17:35:53 | 66.6 |
| 154 | 2019/03/25 | 17:35:56 | 68.3 |
| 155 | 2019/03/25 | 17:35:59 | 63.3 |
| 156 | 2019/03/25 | 17:36:02 | 66.9 |
| 157 | 2019/03/25 | 17:36:05 | 64.2 |
| 158 | 2019/03/25 | 17:36:08 | 67.5 |
| 159 | 2019/03/25 | 17:36:11 | 70.5 |
| 160 | 2019/03/25 | 17:36:14 | 66.9 |
| 161 | 2019/03/25 | 17:36:17 | 61.1 |
| 162 | 2019/03/25 | 17:36:20 | 61.8 |
| 163 | 2019/03/25 | 17:36:23 | 59.4 |
| 164 | 2019/03/25 | 17:36:26 | 56.0 |
| 165 | 2019/03/25 | 17:36:29 | 54.0 |
| 166 | 2019/03/25 | 17:36:32 | 52.3 |
| 167 | 2019/03/25 | 17:36:35 | 50.7 |
| 168 | 2019/03/25 | 17:36:38 | 48.4 |
| 169 | 2019/03/25 | 17:36:41 | 53.0 |
| 170 | 2019/03/25 | 17:36:44 | 65.1 |
| 171 | 2019/03/25 | 17:36:47 | 67.2 |
| 172 | 2019/03/25 | 17:36:50 | 65.4 |
| 173 | 2019/03/25 | 17:36:53 | 62.3 |
| 174 | 2019/03/25 | 17:36:56 | 70.4 |
| 175 | 2019/03/25 | 17:36:59 | 69.4 |
| 176 | 2019/03/25 | 17:37:02 | 69.4 |
| 177 | 2019/03/25 | 17:37:05 | 66.6 |
| 178 | 2019/03/25 | 17:37:08 | 67.8 |
| 179 | 2019/03/25 | 17:37:11 | 65.7 |
| 180 | 2019/03/25 | 17:37:14 | 69.3 |
| 181 | 2019/03/25 | 17:37:17 | 67.3 |
| 182 | 2019/03/25 | 17:37:20 | 67.1 |
| 183 | 2019/03/25 | 17:37:23 | 66.4 |
| 184 | 2019/03/25 | 17:37:26 | 65.1 |

| | | | |
|-----|------------|------------|------|
| 185 | 2019/03/25 | 17: 37: 29 | 66.2 |
| 186 | 2019/03/25 | 17: 37: 32 | 65.9 |
| 187 | 2019/03/25 | 17: 37: 35 | 60.0 |
| 188 | 2019/03/25 | 17: 37: 38 | 54.1 |
| 189 | 2019/03/25 | 17: 37: 41 | 48.6 |
| 190 | 2019/03/25 | 17: 37: 44 | 48.9 |
| 191 | 2019/03/25 | 17: 37: 47 | 54.6 |
| 192 | 2019/03/25 | 17: 37: 50 | 53.1 |
| 193 | 2019/03/25 | 17: 37: 53 | 50.9 |
| 194 | 2019/03/25 | 17: 37: 56 | 53.5 |
| 195 | 2019/03/25 | 17: 37: 59 | 66.3 |
| 196 | 2019/03/25 | 17: 38: 02 | 60.4 |
| 197 | 2019/03/25 | 17: 38: 05 | 61.5 |
| 198 | 2019/03/25 | 17: 38: 08 | 70.7 |
| 199 | 2019/03/25 | 17: 38: 11 | 63.2 |
| 200 | 2019/03/25 | 17: 38: 14 | 58.9 |

Freq Weight : A
Time Weight : SLOW
Level Range : 40-100
Max dB : 66.2 - 2019/03/25 17:56:28
Level Range : 40-100
SEL : 87.0
Leq : 59.3

| No. s | Date Time | (dB) |
|-------|---------------------|------|
| 1 | 2019/03/25 17:49:31 | 57.2 |
| 2 | 2019/03/25 17:49:34 | 52.5 |
| 3 | 2019/03/25 17:49:37 | 57.8 |
| 4 | 2019/03/25 17:49:40 | 60.3 |
| 5 | 2019/03/25 17:49:43 | 58.3 |
| 6 | 2019/03/25 17:49:46 | 56.7 |
| 7 | 2019/03/25 17:49:49 | 60.2 |
| 8 | 2019/03/25 17:49:52 | 60.1 |
| 9 | 2019/03/25 17:49:55 | 60.4 |
| 10 | 2019/03/25 17:49:58 | 58.2 |
| 11 | 2019/03/25 17:50:01 | 59.2 |
| 12 | 2019/03/25 17:50:04 | 60.6 |
| 13 | 2019/03/25 17:50:07 | 60.5 |
| 14 | 2019/03/25 17:50:10 | 64.4 |
| 15 | 2019/03/25 17:50:13 | 60.2 |
| 16 | 2019/03/25 17:50:16 | 57.9 |
| 17 | 2019/03/25 17:50:19 | 58.8 |
| 18 | 2019/03/25 17:50:22 | 59.2 |
| 19 | 2019/03/25 17:50:25 | 58.5 |
| 20 | 2019/03/25 17:50:28 | 61.8 |
| 21 | 2019/03/25 17:50:31 | 61.1 |
| 22 | 2019/03/25 17:50:34 | 60.2 |
| 23 | 2019/03/25 17:50:37 | 56.4 |
| 24 | 2019/03/25 17:50:40 | 56.7 |
| 25 | 2019/03/25 17:50:43 | 58.3 |
| 26 | 2019/03/25 17:50:46 | 59.9 |
| 27 | 2019/03/25 17:50:49 | 59.0 |
| 28 | 2019/03/25 17:50:52 | 58.1 |
| 29 | 2019/03/25 17:50:55 | 53.9 |
| 30 | 2019/03/25 17:50:58 | 58.2 |
| 31 | 2019/03/25 17:51:01 | 57.1 |
| 32 | 2019/03/25 17:51:04 | 57.9 |
| 33 | 2019/03/25 17:51:07 | 58.9 |
| 34 | 2019/03/25 17:51:10 | 58.2 |
| 35 | 2019/03/25 17:51:13 | 57.2 |
| 36 | 2019/03/25 17:51:16 | 57.6 |
| 37 | 2019/03/25 17:51:19 | 60.0 |
| 38 | 2019/03/25 17:51:22 | 61.0 |
| 39 | 2019/03/25 17:51:25 | 59.3 |
| 40 | 2019/03/25 17:51:28 | 58.7 |
| 41 | 2019/03/25 17:51:31 | 59.4 |
| 42 | 2019/03/25 17:51:34 | 57.5 |
| 43 | 2019/03/25 17:51:37 | 57.1 |
| 44 | 2019/03/25 17:51:40 | 58.7 |
| 45 | 2019/03/25 17:51:43 | 60.7 |
| 46 | 2019/03/25 17:51:46 | 59.2 |
| 47 | 2019/03/25 17:51:49 | 59.7 |
| 48 | 2019/03/25 17:51:52 | 59.2 |
| 49 | 2019/03/25 17:51:55 | 59.3 |
| 50 | 2019/03/25 17:51:58 | 59.0 |
| 51 | 2019/03/25 17:52:01 | 56.0 |
| 52 | 2019/03/25 17:52:04 | 54.2 |
| 53 | 2019/03/25 17:52:07 | 52.9 |
| 54 | 2019/03/25 17:52:10 | 53.3 |
| 55 | 2019/03/25 17:52:13 | 57.1 |
| 56 | 2019/03/25 17:52:16 | 60.5 |
| 57 | 2019/03/25 17:52:19 | 59.2 |
| 58 | 2019/03/25 17:52:22 | 60.3 |
| 59 | 2019/03/25 17:52:25 | 60.4 |
| 60 | 2019/03/25 17:52:28 | 57.7 |
| 61 | 2019/03/25 17:52:31 | 59.2 |
| 62 | 2019/03/25 17:52:34 | 58.7 |
| 63 | 2019/03/25 17:52:37 | 59.7 |
| 64 | 2019/03/25 17:52:40 | 60.4 |
| 65 | 2019/03/25 17:52:43 | 60.9 |
| 66 | 2019/03/25 17:52:46 | 59.9 |
| 67 | 2019/03/25 17:52:49 | 58.9 |
| 68 | 2019/03/25 17:52:52 | 58.3 |
| 69 | 2019/03/25 17:52:55 | 59.0 |
| 70 | 2019/03/25 17:52:58 | 58.1 |
| 71 | 2019/03/25 17:53:01 | 57.7 |
| 72 | 2019/03/25 17:53:04 | 58.6 |
| 73 | 2019/03/25 17:53:07 | 56.4 |
| 74 | 2019/03/25 17:53:10 | 54.4 |
| 75 | 2019/03/25 17:53:13 | 56.1 |
| 76 | 2019/03/25 17:53:16 | 56.8 |
| 77 | 2019/03/25 17:53:19 | 57.1 |
| 78 | 2019/03/25 17:53:22 | 58.8 |
| 79 | 2019/03/25 17:53:25 | 58.6 |
| 80 | 2019/03/25 17:53:28 | 60.0 |
| 81 | 2019/03/25 17:53:31 | 60.3 |
| 82 | 2019/03/25 17:53:34 | 60.2 |
| 83 | 2019/03/25 17:53:37 | 58.3 |
| 84 | 2019/03/25 17:53:40 | 58.9 |
| 85 | 2019/03/25 17:53:43 | 60.3 |

| | | | |
|-----|------------|------------|-------|
| 86 | 2019/03/25 | 17: 53: 46 | 58. 8 |
| 87 | 2019/03/25 | 17: 53: 49 | 59. 7 |
| 88 | 2019/03/25 | 17: 53: 52 | 59. 7 |
| 89 | 2019/03/25 | 17: 53: 55 | 59. 3 |
| 90 | 2019/03/25 | 17: 53: 58 | 59. 7 |
| 91 | 2019/03/25 | 17: 54: 01 | 59. 5 |
| 92 | 2019/03/25 | 17: 54: 04 | 60. 1 |
| 93 | 2019/03/25 | 17: 54: 07 | 60. 4 |
| 94 | 2019/03/25 | 17: 54: 10 | 60. 6 |
| 95 | 2019/03/25 | 17: 54: 13 | 60. 4 |
| 96 | 2019/03/25 | 17: 54: 16 | 59. 4 |
| 97 | 2019/03/25 | 17: 54: 19 | 58. 5 |
| 98 | 2019/03/25 | 17: 54: 22 | 60. 6 |
| 99 | 2019/03/25 | 17: 54: 25 | 58. 8 |
| 100 | 2019/03/25 | 17: 54: 28 | 57. 9 |
| 101 | 2019/03/25 | 17: 54: 31 | 57. 9 |
| 102 | 2019/03/25 | 17: 54: 34 | 56. 0 |
| 103 | 2019/03/25 | 17: 54: 37 | 57. 4 |
| 104 | 2019/03/25 | 17: 54: 40 | 57. 8 |
| 105 | 2019/03/25 | 17: 54: 43 | 58. 2 |
| 106 | 2019/03/25 | 17: 54: 46 | 54. 4 |
| 107 | 2019/03/25 | 17: 54: 49 | 53. 4 |
| 108 | 2019/03/25 | 17: 54: 52 | 53. 3 |
| 109 | 2019/03/25 | 17: 54: 55 | 54. 2 |
| 110 | 2019/03/25 | 17: 54: 58 | 57. 1 |
| 111 | 2019/03/25 | 17: 55: 01 | 59. 8 |
| 112 | 2019/03/25 | 17: 55: 04 | 58. 8 |
| 113 | 2019/03/25 | 17: 55: 07 | 58. 9 |
| 114 | 2019/03/25 | 17: 55: 10 | 58. 6 |
| 115 | 2019/03/25 | 17: 55: 13 | 58. 6 |
| 116 | 2019/03/25 | 17: 55: 16 | 60. 6 |
| 117 | 2019/03/25 | 17: 55: 19 | 58. 9 |
| 118 | 2019/03/25 | 17: 55: 22 | 57. 0 |
| 119 | 2019/03/25 | 17: 55: 25 | 57. 1 |
| 120 | 2019/03/25 | 17: 55: 28 | 57. 1 |
| 121 | 2019/03/25 | 17: 55: 31 | 59. 0 |
| 122 | 2019/03/25 | 17: 55: 34 | 60. 2 |
| 123 | 2019/03/25 | 17: 55: 37 | 62. 4 |
| 124 | 2019/03/25 | 17: 55: 40 | 60. 4 |
| 125 | 2019/03/25 | 17: 55: 43 | 59. 2 |
| 126 | 2019/03/25 | 17: 55: 46 | 59. 5 |
| 127 | 2019/03/25 | 17: 55: 49 | 59. 8 |
| 128 | 2019/03/25 | 17: 55: 52 | 60. 8 |
| 129 | 2019/03/25 | 17: 55: 55 | 59. 9 |
| 130 | 2019/03/25 | 17: 55: 58 | 58. 4 |
| 131 | 2019/03/25 | 17: 56: 01 | 59. 0 |
| 132 | 2019/03/25 | 17: 56: 04 | 61. 0 |
| 133 | 2019/03/25 | 17: 56: 07 | 61. 7 |
| 134 | 2019/03/25 | 17: 56: 10 | 60. 5 |
| 135 | 2019/03/25 | 17: 56: 13 | 63. 3 |
| 136 | 2019/03/25 | 17: 56: 16 | 63. 3 |
| 137 | 2019/03/25 | 17: 56: 19 | 63. 6 |
| 138 | 2019/03/25 | 17: 56: 22 | 64. 0 |
| 139 | 2019/03/25 | 17: 56: 25 | 66. 0 |
| 140 | 2019/03/25 | 17: 56: 28 | 64. 7 |
| 141 | 2019/03/25 | 17: 56: 31 | 59. 8 |
| 142 | 2019/03/25 | 17: 56: 34 | 58. 9 |
| 143 | 2019/03/25 | 17: 56: 37 | 59. 6 |
| 144 | 2019/03/25 | 17: 56: 40 | 61. 6 |
| 145 | 2019/03/25 | 17: 56: 43 | 61. 0 |
| 146 | 2019/03/25 | 17: 56: 46 | 59. 8 |
| 147 | 2019/03/25 | 17: 56: 49 | 57. 8 |
| 148 | 2019/03/25 | 17: 56: 52 | 56. 2 |
| 149 | 2019/03/25 | 17: 56: 55 | 57. 7 |
| 150 | 2019/03/25 | 17: 56: 58 | 59. 5 |
| 151 | 2019/03/25 | 17: 57: 01 | 63. 4 |
| 152 | 2019/03/25 | 17: 57: 04 | 63. 4 |
| 153 | 2019/03/25 | 17: 57: 07 | 60. 6 |
| 154 | 2019/03/25 | 17: 57: 10 | 59. 6 |
| 155 | 2019/03/25 | 17: 57: 13 | 59. 8 |
| 156 | 2019/03/25 | 17: 57: 16 | 59. 4 |
| 157 | 2019/03/25 | 17: 57: 19 | 59. 4 |
| 158 | 2019/03/25 | 17: 57: 22 | 55. 0 |
| 159 | 2019/03/25 | 17: 57: 25 | 54. 3 |
| 160 | 2019/03/25 | 17: 57: 28 | 55. 5 |
| 161 | 2019/03/25 | 17: 57: 31 | 60. 2 |
| 162 | 2019/03/25 | 17: 57: 34 | 57. 9 |
| 163 | 2019/03/25 | 17: 57: 37 | 57. 6 |
| 164 | 2019/03/25 | 17: 57: 40 | 59. 6 |
| 165 | 2019/03/25 | 17: 57: 43 | 56. 9 |
| 166 | 2019/03/25 | 17: 57: 46 | 55. 1 |
| 167 | 2019/03/25 | 17: 57: 49 | 55. 8 |
| 168 | 2019/03/25 | 17: 57: 52 | 56. 0 |
| 169 | 2019/03/25 | 17: 57: 55 | 59. 8 |
| 170 | 2019/03/25 | 17: 57: 58 | 60. 2 |
| 171 | 2019/03/25 | 17: 58: 01 | 58. 3 |
| 172 | 2019/03/25 | 17: 58: 04 | 58. 1 |
| 173 | 2019/03/25 | 17: 58: 07 | 58. 3 |
| 174 | 2019/03/25 | 17: 58: 10 | 57. 7 |
| 175 | 2019/03/25 | 17: 58: 13 | 56. 3 |
| 176 | 2019/03/25 | 17: 58: 16 | 56. 3 |
| 177 | 2019/03/25 | 17: 58: 19 | 55. 6 |
| 178 | 2019/03/25 | 17: 58: 22 | 56. 9 |
| 179 | 2019/03/25 | 17: 58: 25 | 58. 2 |
| 180 | 2019/03/25 | 17: 58: 28 | 57. 9 |
| 181 | 2019/03/25 | 17: 58: 31 | 57. 9 |
| 182 | 2019/03/25 | 17: 58: 34 | 56. 1 |
| 183 | 2019/03/25 | 17: 58: 37 | 55. 4 |
| 184 | 2019/03/25 | 17: 58: 40 | 55. 4 |

| | | | |
|-----|------------|------------|-------|
| 185 | 2019/03/25 | 17: 58: 43 | 57. 0 |
| 186 | 2019/03/25 | 17: 58: 46 | 59. 6 |
| 187 | 2019/03/25 | 17: 58: 49 | 59. 7 |
| 188 | 2019/03/25 | 17: 58: 52 | 56. 5 |
| 189 | 2019/03/25 | 17: 58: 55 | 56. 4 |
| 190 | 2019/03/25 | 17: 58: 58 | 58. 9 |
| 191 | 2019/03/25 | 17: 59: 01 | 57. 8 |
| 192 | 2019/03/25 | 17: 59: 04 | 56. 8 |
| 193 | 2019/03/25 | 17: 59: 07 | 60. 7 |
| 194 | 2019/03/25 | 17: 59: 10 | 62. 4 |
| 195 | 2019/03/25 | 17: 59: 13 | 63. 5 |
| 196 | 2019/03/25 | 17: 59: 16 | 61. 2 |
| 197 | 2019/03/25 | 17: 59: 19 | 59. 5 |
| 198 | 2019/03/25 | 17: 59: 22 | 59. 4 |
| 199 | 2019/03/25 | 17: 59: 25 | 61. 9 |
| 200 | 2019/03/25 | 17: 59: 28 | 61. 4 |

Freq Weight : A
Time Weight : SLOW
Level Range : 40-100
Max dB : 81.5 - 2019/03/25 18:09:05
Level Range : 40-100
SEL : 100.7
Leq : 73.0

| No. s | Date Time | (dB) |
|-------|---------------------|------|
| 1 | 2019/03/25 18:06:45 | 75.8 |
| 2 | 2019/03/25 18:06:48 | 73.0 |
| 3 | 2019/03/25 18:06:51 | 72.0 |
| 4 | 2019/03/25 18:06:54 | 68.3 |
| 5 | 2019/03/25 18:06:57 | 69.8 |
| 6 | 2019/03/25 18:07:00 | 77.7 |
| 7 | 2019/03/25 18:07:03 | 77.8 |
| 8 | 2019/03/25 18:07:06 | 77.8 |
| 9 | 2019/03/25 18:07:09 | 78.4 |
| 10 | 2019/03/25 18:07:12 | 75.0 |
| 11 | 2019/03/25 18:07:15 | 75.6 |
| 12 | 2019/03/25 18:07:18 | 74.5 |
| 13 | 2019/03/25 18:07:21 | 77.6 |
| 14 | 2019/03/25 18:07:24 | 75.1 |
| 15 | 2019/03/25 18:07:27 | 76.3 |
| 16 | 2019/03/25 18:07:30 | 73.1 |
| 17 | 2019/03/25 18:07:33 | 71.4 |
| 18 | 2019/03/25 18:07:36 | 69.6 |
| 19 | 2019/03/25 18:07:39 | 66.6 |
| 20 | 2019/03/25 18:07:42 | 65.6 |
| 21 | 2019/03/25 18:07:45 | 68.2 |
| 22 | 2019/03/25 18:07:48 | 68.6 |
| 23 | 2019/03/25 18:07:51 | 64.6 |
| 24 | 2019/03/25 18:07:54 | 66.8 |
| 25 | 2019/03/25 18:07:57 | 66.3 |
| 26 | 2019/03/25 18:08:00 | 66.1 |
| 27 | 2019/03/25 18:08:03 | 66.8 |
| 28 | 2019/03/25 18:08:06 | 63.8 |
| 29 | 2019/03/25 18:08:09 | 65.4 |
| 30 | 2019/03/25 18:08:12 | 68.0 |
| 31 | 2019/03/25 18:08:15 | 70.5 |
| 32 | 2019/03/25 18:08:18 | 71.1 |
| 33 | 2019/03/25 18:08:21 | 74.2 |
| 34 | 2019/03/25 18:08:24 | 79.0 |
| 35 | 2019/03/25 18:08:27 | 77.3 |
| 36 | 2019/03/25 18:08:30 | 72.2 |
| 37 | 2019/03/25 18:08:33 | 69.7 |
| 38 | 2019/03/25 18:08:36 | 77.9 |
| 39 | 2019/03/25 18:08:39 | 77.2 |
| 40 | 2019/03/25 18:08:42 | 76.0 |
| 41 | 2019/03/25 18:08:45 | 73.3 |
| 42 | 2019/03/25 18:08:48 | 74.7 |
| 43 | 2019/03/25 18:08:51 | 72.0 |
| 44 | 2019/03/25 18:08:54 | 71.6 |
| 45 | 2019/03/25 18:08:57 | 72.2 |
| 46 | 2019/03/25 18:09:00 | 72.2 |
| 47 | 2019/03/25 18:09:03 | 80.0 |
| 48 | 2019/03/25 18:09:06 | 73.8 |
| 49 | 2019/03/25 18:09:09 | 68.7 |
| 50 | 2019/03/25 18:09:12 | 69.5 |
| 51 | 2019/03/25 18:09:15 | 70.4 |
| 52 | 2019/03/25 18:09:18 | 75.2 |
| 53 | 2019/03/25 18:09:21 | 72.5 |
| 54 | 2019/03/25 18:09:24 | 68.8 |
| 55 | 2019/03/25 18:09:27 | 65.1 |
| 56 | 2019/03/25 18:09:30 | 67.9 |
| 57 | 2019/03/25 18:09:33 | 68.1 |
| 58 | 2019/03/25 18:09:36 | 60.4 |
| 59 | 2019/03/25 18:09:39 | 58.3 |
| 60 | 2019/03/25 18:09:42 | 61.9 |
| 61 | 2019/03/25 18:09:45 | 61.4 |
| 62 | 2019/03/25 18:09:48 | 63.8 |
| 63 | 2019/03/25 18:09:51 | 64.3 |
| 64 | 2019/03/25 18:09:54 | 76.5 |
| 65 | 2019/03/25 18:09:57 | 77.4 |
| 66 | 2019/03/25 18:10:00 | 76.1 |
| 67 | 2019/03/25 18:10:03 | 77.6 |
| 68 | 2019/03/25 18:10:06 | 73.7 |
| 69 | 2019/03/25 18:10:09 | 74.7 |
| 70 | 2019/03/25 18:10:12 | 69.5 |
| 71 | 2019/03/25 18:10:15 | 74.0 |
| 72 | 2019/03/25 18:10:18 | 72.5 |
| 73 | 2019/03/25 18:10:21 | 75.4 |
| 74 | 2019/03/25 18:10:24 | 73.1 |
| 75 | 2019/03/25 18:10:27 | 72.0 |
| 76 | 2019/03/25 18:10:30 | 71.5 |
| 77 | 2019/03/25 18:10:33 | 76.7 |
| 78 | 2019/03/25 18:10:36 | 72.8 |
| 79 | 2019/03/25 18:10:39 | 70.2 |
| 80 | 2019/03/25 18:10:42 | 70.0 |
| 81 | 2019/03/25 18:10:45 | 78.2 |
| 82 | 2019/03/25 18:10:48 | 73.7 |
| 83 | 2019/03/25 18:10:51 | 76.1 |
| 84 | 2019/03/25 18:10:54 | 68.0 |
| 85 | 2019/03/25 18:10:57 | 64.5 |

| | | | |
|-----|------------|----------|------|
| 86 | 2019/03/25 | 18:11:00 | 73.5 |
| 87 | 2019/03/25 | 18:11:03 | 75.7 |
| 88 | 2019/03/25 | 18:11:06 | 75.6 |
| 89 | 2019/03/25 | 18:11:09 | 71.4 |
| 90 | 2019/03/25 | 18:11:12 | 69.9 |
| 91 | 2019/03/25 | 18:11:15 | 71.2 |
| 92 | 2019/03/25 | 18:11:18 | 69.5 |
| 93 | 2019/03/25 | 18:11:21 | 67.6 |
| 94 | 2019/03/25 | 18:11:24 | 69.5 |
| 95 | 2019/03/25 | 18:11:27 | 69.2 |
| 96 | 2019/03/25 | 18:11:30 | 68.8 |
| 97 | 2019/03/25 | 18:11:33 | 73.4 |
| 98 | 2019/03/25 | 18:11:36 | 73.5 |
| 99 | 2019/03/25 | 18:11:39 | 74.2 |
| 100 | 2019/03/25 | 18:11:42 | 74.5 |
| 101 | 2019/03/25 | 18:11:45 | 72.8 |
| 102 | 2019/03/25 | 18:11:48 | 76.5 |
| 103 | 2019/03/25 | 18:11:51 | 72.6 |
| 104 | 2019/03/25 | 18:11:54 | 75.5 |
| 105 | 2019/03/25 | 18:11:57 | 76.5 |
| 106 | 2019/03/25 | 18:12:00 | 74.4 |
| 107 | 2019/03/25 | 18:12:03 | 69.9 |
| 108 | 2019/03/25 | 18:12:06 | 74.3 |
| 109 | 2019/03/25 | 18:12:09 | 71.8 |
| 110 | 2019/03/25 | 18:12:12 | 71.0 |
| 111 | 2019/03/25 | 18:12:15 | 72.1 |
| 112 | 2019/03/25 | 18:12:18 | 71.1 |
| 113 | 2019/03/25 | 18:12:21 | 70.5 |
| 114 | 2019/03/25 | 18:12:24 | 66.1 |
| 115 | 2019/03/25 | 18:12:27 | 65.8 |
| 116 | 2019/03/25 | 18:12:30 | 69.9 |
| 117 | 2019/03/25 | 18:12:33 | 70.5 |
| 118 | 2019/03/25 | 18:12:36 | 72.3 |
| 119 | 2019/03/25 | 18:12:39 | 75.2 |
| 120 | 2019/03/25 | 18:12:42 | 70.8 |
| 121 | 2019/03/25 | 18:12:45 | 74.5 |
| 122 | 2019/03/25 | 18:12:48 | 71.2 |
| 123 | 2019/03/25 | 18:12:51 | 70.7 |
| 124 | 2019/03/25 | 18:12:54 | 71.9 |
| 125 | 2019/03/25 | 18:12:57 | 73.7 |
| 126 | 2019/03/25 | 18:13:00 | 72.2 |
| 127 | 2019/03/25 | 18:13:03 | 75.8 |
| 128 | 2019/03/25 | 18:13:06 | 77.8 |
| 129 | 2019/03/25 | 18:13:09 | 75.4 |
| 130 | 2019/03/25 | 18:13:12 | 73.5 |
| 131 | 2019/03/25 | 18:13:15 | 76.0 |
| 132 | 2019/03/25 | 18:13:18 | 76.2 |
| 133 | 2019/03/25 | 18:13:21 | 74.4 |
| 134 | 2019/03/25 | 18:13:24 | 76.1 |
| 135 | 2019/03/25 | 18:13:27 | 74.9 |
| 136 | 2019/03/25 | 18:13:30 | 74.6 |
| 137 | 2019/03/25 | 18:13:33 | 73.2 |
| 138 | 2019/03/25 | 18:13:36 | 71.6 |
| 139 | 2019/03/25 | 18:13:39 | 72.4 |
| 140 | 2019/03/25 | 18:13:42 | 73.0 |
| 141 | 2019/03/25 | 18:13:45 | 68.6 |
| 142 | 2019/03/25 | 18:13:48 | 62.2 |
| 143 | 2019/03/25 | 18:13:51 | 64.3 |
| 144 | 2019/03/25 | 18:13:54 | 67.3 |
| 145 | 2019/03/25 | 18:13:57 | 68.2 |
| 146 | 2019/03/25 | 18:14:00 | 67.8 |
| 147 | 2019/03/25 | 18:14:03 | 68.1 |
| 148 | 2019/03/25 | 18:14:06 | 70.9 |
| 149 | 2019/03/25 | 18:14:09 | 75.4 |
| 150 | 2019/03/25 | 18:14:12 | 73.9 |
| 151 | 2019/03/25 | 18:14:15 | 71.8 |
| 152 | 2019/03/25 | 18:14:18 | 74.4 |
| 153 | 2019/03/25 | 18:14:21 | 67.0 |
| 154 | 2019/03/25 | 18:14:24 | 69.1 |
| 155 | 2019/03/25 | 18:14:27 | 69.9 |
| 156 | 2019/03/25 | 18:14:30 | 75.1 |
| 157 | 2019/03/25 | 18:14:33 | 72.3 |
| 158 | 2019/03/25 | 18:14:36 | 69.9 |
| 159 | 2019/03/25 | 18:14:39 | 76.0 |
| 160 | 2019/03/25 | 18:14:42 | 72.6 |
| 161 | 2019/03/25 | 18:14:45 | 70.7 |
| 162 | 2019/03/25 | 18:14:48 | 70.6 |
| 163 | 2019/03/25 | 18:14:51 | 69.9 |
| 164 | 2019/03/25 | 18:14:54 | 66.9 |
| 165 | 2019/03/25 | 18:14:57 | 70.9 |
| 166 | 2019/03/25 | 18:15:00 | 75.1 |
| 167 | 2019/03/25 | 18:15:03 | 78.6 |
| 168 | 2019/03/25 | 18:15:06 | 73.1 |
| 169 | 2019/03/25 | 18:15:09 | 67.5 |
| 170 | 2019/03/25 | 18:15:12 | 70.0 |
| 171 | 2019/03/25 | 18:15:15 | 74.1 |
| 172 | 2019/03/25 | 18:15:18 | 74.3 |
| 173 | 2019/03/25 | 18:15:21 | 74.9 |
| 174 | 2019/03/25 | 18:15:24 | 74.3 |
| 175 | 2019/03/25 | 18:15:27 | 70.9 |
| 176 | 2019/03/25 | 18:15:30 | 72.1 |
| 177 | 2019/03/25 | 18:15:33 | 69.4 |
| 178 | 2019/03/25 | 18:15:36 | 72.0 |
| 179 | 2019/03/25 | 18:15:39 | 68.7 |
| 180 | 2019/03/25 | 18:15:42 | 64.7 |
| 181 | 2019/03/25 | 18:15:45 | 66.5 |
| 182 | 2019/03/25 | 18:15:48 | 69.7 |
| 183 | 2019/03/25 | 18:15:51 | 73.2 |
| 184 | 2019/03/25 | 18:15:54 | 75.1 |

| | | | |
|-----|------------|------------|-------|
| 185 | 2019/03/25 | 18: 15: 57 | 70. 2 |
| 186 | 2019/03/25 | 18: 16: 00 | 71. 8 |
| 187 | 2019/03/25 | 18: 16: 03 | 70. 4 |
| 188 | 2019/03/25 | 18: 16: 06 | 75. 7 |
| 189 | 2019/03/25 | 18: 16: 09 | 75. 6 |
| 190 | 2019/03/25 | 18: 16: 12 | 73. 3 |
| 191 | 2019/03/25 | 18: 16: 15 | 73. 8 |
| 192 | 2019/03/25 | 18: 16: 18 | 73. 3 |
| 193 | 2019/03/25 | 18: 16: 21 | 69. 9 |
| 194 | 2019/03/25 | 18: 16: 24 | 68. 8 |
| 195 | 2019/03/25 | 18: 16: 27 | 66. 6 |
| 196 | 2019/03/25 | 18: 16: 30 | 66. 8 |
| 197 | 2019/03/25 | 18: 16: 33 | 66. 4 |
| 198 | 2019/03/25 | 18: 16: 36 | 60. 7 |
| 199 | 2019/03/25 | 18: 16: 39 | 62. 4 |
| 200 | 2019/03/25 | 18: 16: 42 | 62. 4 |

Roadway Construction Noise Model (RCNM), Version 1.1

Report date: 07/17/2019
 Case Description: 300 Studebaker Road

**** Receptor #1 ****

| Description | Land Use | Baselines (dBA) | | |
|------------------|-------------|-----------------|---------|-------|
| | | Daytime | Evening | Night |
| Cerritos Channel | Residential | 80.0 | 80.0 | 80.0 |

| Description | Impact Device | Usage (%) | Equipment | | | |
|-----------------------|---------------|-----------|-----------------|-------------------|--------------------------|---------------------------|
| | | | Spec Lmax (dBA) | Actual Lmax (dBA) | Receptor Distance (feet) | Estimated Shielding (dBA) |
| Dozer | No | 40 | | 81.7 | 475.0 | 0.0 |
| Excavator | No | 40 | | 80.7 | 475.0 | 0.0 |
| Front End Loader | No | 40 | | 79.1 | 475.0 | 0.0 |
| Vibratory Pile Driver | No | 20 | | 100.8 | 475.0 | 0.0 |

Results

Noise Limit Exceedance (dBA) Noise Limits (dBA)

| Equipment | Night | Calculated (dBA) | | | | Day | | Evening | | Lmax |
|-----------------------|-------|------------------|---------|------|------|-------|------|---------|------|------|
| | | Day | Evening | | Day | Night | Lmax | Leq | | |
| Leq | Lmax | Leq | Lmax | Leq | Lmax | Leq | Lmax | Leq | Lmax | |
| Dozer | N/A | N/A | 62.1 | 58.1 | N/A | N/A | N/A | N/A | N/A | |
| Excavator | N/A | N/A | 61.2 | 57.2 | N/A | N/A | N/A | N/A | N/A | |
| Front End Loader | N/A | N/A | 59.6 | 55.6 | N/A | N/A | N/A | N/A | N/A | |
| Vibratory Pile Driver | N/A | N/A | 81.3 | 74.3 | N/A | N/A | N/A | N/A | N/A | |
| | | Total | 81.3 | 74.5 | N/A | N/A | N/A | N/A | N/A | |

**** Receptor #2 ****

| Description | Land Use | Baselines (dBA) | | |
|-------------------|-------------|-----------------|---------|-------|
| | | Daytime | Evening | Night |
| Channel View Park | Residential | 80.0 | 80.0 | 80.0 |

| Description | Impact Device | Usage (%) | Equipment | | | |
|-----------------------|---------------|-----------|-----------------|-------------------|--------------------------|---------------------------|
| | | | Spec Lmax (dBA) | Actual Lmax (dBA) | Receptor Distance (feet) | Estimated Shielding (dBA) |
| Dozer | No | 40 | | 81.7 | 700.0 | 0.0 |
| Excavator | No | 40 | | 80.7 | 700.0 | 0.0 |
| Front End Loader | No | 40 | | 79.1 | 700.0 | 0.0 |
| Vibratory Pile Driver | No | 20 | | 100.8 | 700.0 | 0.0 |

Results

| Night | Noise Limit Exceedance (dBA) | | | | | Noise Limits (dBA) | | | |
|-----------------------|------------------------------|------|---------|------|-----------|--------------------|------|-----|------|
| | Day | | Evening | | Day Night | Evening | | | |
| Equipment | Leq | Lmax | Leq | Lmax | Lmax | Leq | Lmax | Leq | Lmax |
| Dozer | N/A | N/A | 58.7 | 54.8 | N/A | N/A | N/A | N/A | N/A |
| Excavator | N/A | N/A | 57.8 | 53.8 | N/A | N/A | N/A | N/A | N/A |
| Front End Loader | N/A | N/A | 56.2 | 52.2 | N/A | N/A | N/A | N/A | N/A |
| Vibratory Pile Driver | N/A | N/A | 77.9 | 70.9 | N/A | N/A | N/A | N/A | N/A |
| Total | N/A | N/A | 77.9 | 71.1 | N/A | N/A | N/A | N/A | N/A |

**** Receptor #3 ****

| Description | Land Use | Baselines (dBA) | | |
|-------------|----------|-----------------|---------|-------|
| | | Daytime | Evening | Night |

Single-Family Residences Residential 80.0 80.0 80.0

Equipment

| Description | Impact Device | Usage (%) | Spec Lmax (dBA) | Actual Lmax (dBA) | Receptor Distance (feet) | Estimated Shielding (dBA) |
|-----------------------|---------------|-----------|-----------------|-------------------|--------------------------|---------------------------|
| Dozer | No | 40 | | 81.7 | 775.0 | 0.0 |
| Excavator | No | 40 | | 80.7 | 775.0 | 0.0 |
| Front End Loader | No | 40 | | 79.1 | 775.0 | 0.0 |
| Vibratory Pile Driver | No | 20 | | 100.8 | 775.0 | 0.0 |

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

| Equipment | Night | Calculated (dBA) | | | | Day | | Evening | | Lmax |
|-----------------------|-------|------------------|---------|------|-------|------|-----|---------|-----|------|
| | | Day | Evening | Day | Night | Lmax | Leq | Lmax | Leq | |
| Dozer | N/A | N/A | 57.9 | 53.9 | N/A | N/A | N/A | N/A | N/A | |
| Excavator | N/A | N/A | 56.9 | 52.9 | N/A | N/A | N/A | N/A | N/A | |
| Front End Loader | N/A | N/A | 55.3 | 51.3 | N/A | N/A | N/A | N/A | N/A | |
| Vibratory Pile Driver | N/A | N/A | 77.0 | 70.0 | N/A | N/A | N/A | N/A | N/A | |
| | | Total | 77.0 | 70.3 | N/A | N/A | N/A | N/A | N/A | |

**** Receptor #4 ****

Baselines (dBA)

| Description | Land Use | Daytime | Evening | Night |
|-----------------------|-------------|---------|---------|-------|
| Los Cerritos Wetlands | Residential | 80.0 | 80.0 | 80.0 |

Equipment

Spec Actual Receptor Estimated

| Description | Impact Device | Usage (%) | Lmax (dBA) | Lmax (dBA) | Distance (feet) | Shielding (dBA) |
|-----------------------|---------------|-----------|------------|------------|-----------------|-----------------|
| Dozer | No | 40 | | 81.7 | 575.0 | 0.0 |
| Excavator | No | 40 | | 80.7 | 575.0 | 0.0 |
| Front End Loader | No | 40 | | 79.1 | 575.0 | 0.0 |
| Vibratory Pile Driver | No | 20 | | 100.8 | 575.0 | 0.0 |

Results

Noise Limit Exceedance (dBA) Noise Limits (dBA)

| Night | Calculated (dBA) | | | | Day | | Evening | | |
|-----------------------|------------------|---------|------|-------|------|-------|---------|-------|------|
| | Day | Evening | Day | Night | Day | Night | Day | Night | Day |
| Equipment | Lmax | Leq | Lmax | Leq | Lmax | Leq | Lmax | Leq | Lmax |
| Dozer | N/A | N/A | 60.5 | 56.5 | N/A | N/A | N/A | N/A | N/A |
| Excavator | N/A | N/A | 59.5 | 55.5 | N/A | N/A | N/A | N/A | N/A |
| Front End Loader | N/A | N/A | 57.9 | 53.9 | N/A | N/A | N/A | N/A | N/A |
| Vibratory Pile Driver | N/A | N/A | 79.6 | 72.6 | N/A | N/A | N/A | N/A | N/A |
| Total | N/A | N/A | 79.6 | 72.9 | N/A | N/A | N/A | N/A | N/A |

Loading Dock Reference Noise Calculations

| | |
|---|-----------|
| ThermoKing SB-200 Trailer Refrigeration Unit (60-Hertz Standby Electric Reefer) | 96 dBA |
| ThermoKing Super II TC Trailer Refrigeration Unit at High Idle (Diesel Reefer) | 104 dBA |
| Diesel Truck Idling | 96 dBA |
| Total Lpw | 105.2 dBA |
| Total SPL @ 3 ft | 95.0 dBA |
| Total SPL @ 50 ft | 70.5 dBA |
| Total Hourly Leq (50% operation) | 67.5 dBA |

http://www.sbcounty.gov/Uploads/lus/Valley/Pacific_Industrial/Noise.pdf

Loading Dock Noise Calculations: 300 Studebaker Road Industrial Park Project

| Duration | | Leq | Energy | Weighted | |
|----------|---------|---------|--------|----------|--------------|
| Minutes | Seconds | | | | |
| 30.000 | 1800 | 67.5 | 6.E+06 | 1.E+10 | source noise |
| 30.000 | 1800 | 59 | 8.E+05 | 1.E+09 | background |
| 0.000 | 0 | 0 | 1 | 0 | |
| Sum | 3600 | Seconds | 3.E+06 | 1.E+10 | |
| Leq | | 65.1 | | | |

| Type | Ground Type | Reference Leq (dBA) | Reference Distance (Feet) | Receiver Distance | Leq @ Receiver (dBA) | Attenuation From Distance (dBA) |
|-------|-------------|---------------------|---------------------------|-------------------|----------------------|---------------------------------|
| Point | Hard | 65 | 50 | 700 | 42.1 | 22.9 |
| Point | Hard | 65 | 50 | 710 | 42.0 | 23.0 |
| Point | Hard | 65 | 50 | 720 | 41.8 | 23.2 |
| Point | Hard | 65 | 50 | 730 | 41.7 | 23.3 |
| Point | Hard | 65 | 50 | 740 | 41.6 | 23.4 |
| Point | Hard | 65 | 50 | 750 | 41.5 | 23.5 |
| Point | Hard | 65 | 50 | 760 | 41.4 | 23.6 |
| Point | Hard | 65 | 50 | 770 | 41.2 | 23.8 |
| Point | Hard | 65 | 50 | 780 | 41.1 | 23.9 |
| Point | Hard | 65 | 50 | 790 | 41.0 | 24.0 |
| Point | Hard | 65 | 50 | 800 | 40.9 | 24.1 |
| Point | Hard | 65 | 50 | 810 | 40.8 | 24.2 |
| Point | Hard | 65 | 50 | 820 | 40.7 | 24.3 |
| Point | Hard | 65 | 50 | 830 | 40.6 | 24.4 |
| Point | Hard | 65 | 50 | 840 | 40.5 | 24.5 |
| Point | Hard | 65 | 50 | 850 | 40.4 | 24.6 |
| Point | Hard | 65 | 50 | 860 | 40.3 | 24.7 |
| Point | Hard | 65 | 50 | 870 | 40.2 | 24.8 |
| Point | Hard | 65 | 50 | 880 | 40.1 | 24.9 |
| Point | Hard | 65 | 50 | 880 | 40.1 | 24.9 |
| Point | Hard | 78 | 50 | 794.5 | 54.1 | 24.0 |

| Energy | |
|----------|----------|
| 3.16E+06 | 1.61E+04 |
| 3.16E+06 | 1.57E+04 |
| 3.16E+06 | 1.53E+04 |
| 3.16E+06 | 1.48E+04 |
| 3.16E+06 | 1.44E+04 |
| 3.16E+06 | 1.41E+04 |
| 3.16E+06 | 1.37E+04 |
| 3.16E+06 | 1.33E+04 |
| 3.16E+06 | 1.30E+04 |
| 3.16E+06 | 1.27E+04 |
| 3.16E+06 | 1.24E+04 |
| 3.16E+06 | 1.20E+04 |
| 3.16E+06 | 1.18E+04 |
| 3.16E+06 | 1.15E+04 |
| 3.16E+06 | 1.12E+04 |
| 3.16E+06 | 1.09E+04 |
| 3.16E+06 | 1.07E+04 |
| 3.16E+06 | 1.04E+04 |
| 3.16E+06 | 1.02E+04 |
| 3.16E+06 | 1.02E+04 |
| 6.32E+07 | 2.54E+05 |

Reference L 70

Reference C 50

Site Condition Hard

| Distance from Barrier to Source | Distance from Barrier to Receiver | Distance from Source to Receiver | Height of Source | Height of Wall | Height of Receiver | Hm | Hn | delta | fresnel @ 500 Hz | Noise Level Reduction | Unabated Noise Level | Resultant Noise Level |
|---------------------------------|-----------------------------------|----------------------------------|------------------|----------------|--------------------|-------|-------|--------|------------------|-----------------------|----------------------|-----------------------|
| 3 | 700 | 703.0 | 14 | 65 | 5 | -0.04 | -8.96 | 50.597 | 46.565 | 20.00 | 47 | 27.04 |

[Home \(/\)](#) > [Programs \(/programs/\)](#) > [Environmental Review \(/programs/environmental-review/\)](#) > DNL Calculator

DNL Calculator

WARNING: HUD recommends the use of Microsoft Internet Explorer for performing noise calculations. The HUD Noise Calculator has an error when using Google Chrome unless the cache is cleared before each use of the calculator. HUD is aware of the problem and working to fix it in the programming of the calculator.

The Day/Night Noise Level Calculator is an electronic assessment tool that calculates the Day/Night Noise Level (DNL) from roadway and railway traffic. For more information on using the DNL calculator, view the [Day/Night Noise Level Calculator Electronic Assessment Tool Overview \(/programs/environmental-review/daynight-noise-level-electronic-assessment-tool/\)](#).

Guidelines

- To display the Road and/or Rail DNL calculator(s), click on the "Add Road Source" and/or "Add Rail Source" button(s) below.
- All Road and Rail input values must be positive non-decimal numbers.
- All Road and/or Rail DNL value(s) must be calculated separately before calculating the Site DNL.
- All checkboxes that apply must be checked for vehicles and trains in the tables' headers.
- **Note #1:** Tooltips, containing field specific information, have been added in this tool and may be accessed by hovering over all the respective data fields (site identification, roadway and railway assessment, DNL calculation results, roadway and railway input variables) with the mouse.
- **Note #2:** DNL Calculator assumes roadway data is always entered.

DNL Calculator

| | |
|--------------------|--------------------------------|
| Site ID | 300 Studebaker Road - Existing |
| Record Date | 5/1/19 |
| User's Name | Rincon Consultants |

| | |
|-----------------------|---|
| Road # 1 Name: | Loynes Drive west of Studebaker Road |
|-----------------------|---|

Road #1

| Vehicle Type | Cars <input checked="" type="checkbox"/> | Medium Trucks <input checked="" type="checkbox"/> | Heavy Trucks <input type="checkbox"/> |
|------------------------------|---|--|--|
| Effective Distance | 40 | 40 | |
| Distance to Stop Sign | | | |
| Average Speed | 35 | 35 | |
| Average Daily Trips (ADT) | 10536 | 555 | |
| Night Fraction of ADT | 15 | 15 | |
| Road Gradient (%) | | | |
| Vehicle DNL | 65.9879 | 63.2041 | |
| Calculate Road #1 DNL | 67.8528 | Reset | |

Add Road Source **Add Rail Source**

Airport Noise Level

Loud Impulse Sounds?

Yes **No**

| | |
|--------------------|---|
| Site ID | 300 Studebaker Road - Existing plus Project |
| Record Date | 5/1/19 |
| User's Name | Rincon Consultants |

| | |
|-----------------------|---|
| Road # 1 Name: | Loynes Drive west of Studebaker Road |
|-----------------------|---|

Road #1

| Vehicle Type | Cars <input checked="" type="checkbox"/> | Medium Trucks <input checked="" type="checkbox"/> | Heavy Trucks <input type="checkbox"/> |
|------------------------------|---|--|--|
| Effective Distance | 40 | 40 | |
| Distance to Stop Sign | | | |
| Average Speed | 35 | 35 | |
| Average Daily Trips (ADT) | 10659 | 569 | |
| Night Fraction of ADT | 15 | 15 | |
| Road Gradient (%) | | | |
| Vehicle DNL | 66.0383 | 63.3123 | |
| Calculate Road #1 DNL | 67.9205 | Reset | |

| | |
|----------------------------|------------------------|
| Add Road Source | Add Rail Source |
| Airport Noise Level | |

Loud Impulse Sounds?

 Yes No

| | |
|--------------------|---------------------------------|
| Site ID | 300 Studebaker Road - Year 2020 |
| Record Date | 5/1/19 |
| User's Name | Rincon Consultants |

| | |
|-----------------------|---|
| Road # 1 Name: | Loynes Drive west of Studebaker Road |
|-----------------------|---|

Road #1

| Vehicle Type | Cars <input checked="" type="checkbox"/> | Medium Trucks <input checked="" type="checkbox"/> | Heavy Trucks <input type="checkbox"/> |
|------------------------------|---|--|--|
| Effective Distance | 40 | 40 | |
| Distance to Stop Sign | | | |
| Average Speed | 35 | 35 | |
| Average Daily Trips (ADT) | 10859 | 572 | |
| Night Fraction of ADT | 15 | 15 | |
| Road Gradient (%) | | | |
| Vehicle DNL | 66.119 | 63.3351 | |
| Calculate Road #1 DNL | 67.9838 | Reset | |

| | |
|----------------------------|------------------------|
| Add Road Source | Add Rail Source |
| Airport Noise Level | |

Loud Impulse Sounds?

 Yes No

| | |
|--------------------|--|
| Site ID | 300 Studebaker Road - Year 2020 plus Project |
| Record Date | 5/1/19 |
| User's Name | Rincon Consultants |

| | |
|-----------------------|---|
| Road # 1 Name: | Loynes Drive west of Studebaker Road |
|-----------------------|---|

Road #1

| Vehicle Type | Cars <input checked="" type="checkbox"/> | Medium Trucks <input checked="" type="checkbox"/> | Heavy Trucks <input type="checkbox"/> |
|------------------------------|---|--|--|
| Effective Distance | 40 | 40 | |
| Distance to Stop Sign | | | |
| Average Speed | 35 | 35 | |
| Average Daily Trips (ADT) | 10982 | 586 | |
| Night Fraction of ADT | 15 | 15 | |
| Road Gradient (%) | | | |
| Vehicle DNL | 66.168 | 63.4401 | |
| Calculate Road #1 DNL | 68.0496 | Reset | |

| | |
|----------------------------|------------------------|
| Add Road Source | Add Rail Source |
| Airport Noise Level | |

Loud Impulse Sounds?

 Yes **No**

Vibration Analysis - 300 Studebaker

$PPV \text{ (in/sec)} = PPV \text{ (ref)} * (25/D)^{1.5}$
 Where PPV = Peak Particle Velocity
 {ref} = PPV at the reference distance of 25 feet
 D = distance to the receptor

| | |
|--|-------------------------|
| Equipment = | Vibratory Roller |
| PPV{ref} = | 0.21 in/sec |
| D = | 175 feet |
| PPV at receptor = | 0.011 in/sec |
| PPV is 1.7x to 6x larger than RMS velocity | |
| Assume typical conversion factor of | 4 PPV:RMS |
| Therefore estimated RMS velocity = | 0.003 in/sec |
| Receptor Lv = | 69 VdB |

| | |
|--|--------------------------|
| Equipment = | Bulldozer - Large |
| PPV{ref} = | 0.089 in/sec |
| D = | 175 feet |
| PPV at receptor = | 0.005 in/sec |
| PPV is 1.7x to 6x larger than RMS velocity | |
| Assume typical conversion factor of | 4 PPV:RMS |
| Therefore estimated RMS velocity = | 0.001 in/sec |
| Receptor Lv = | 62 VdB |

| | |
|--|----------------------|
| Equipment = | Loaded Trucks |
| PPV{ref} = | 0.076 in/sec |
| D = | 175 feet |
| PPV at receptor = | 0.004 in/sec |
| PPV is 1.7x to 6x larger than RMS velocity | |
| Assume typical conversion factor of | 4 PPV:RMS |
| Therefore estimated RMS velocity = | 0.001 in/sec |
| Receptor Lv = | 60 VdB |

Source: Section 5 Transit Vibration
 Section 6 Vibration Impact Analysis
 Section 7 Noise and Vibration during Construction
Transit Noise and Vibration Assessment, September 2018
 John A. Volpe National Transportation Systems Center
 Prepared For: USDOT Federal Transit Administration

* RMS Velocity in decibels VdB with Vref of 1E-6 in/sec and PPV:RMS of -4

Criterion

| Building Damage | |
|---|-----|
| Type | VdB |
| Extremely susceptible to vibration damage | 90 |
| Non-engineered timber and masonry buildings | 94 |
| Engineered concrete and masonry buildings | 98 |
| Typical buildings | 100 |
| Reinforced concrete, steel, or timber buildings | 102 |

| Canmet, Bauer, and Calder, 1977 | | |
|---------------------------------|-----------------------|--------------------|
| Equipment | PPV Threshold, in/sec | Type of Damage |
| Rigid Mercury Switches | 0.5 | Trip Out |
| House | 2 | Cracked Plaster |
| Concrete Block | 8 | Crack in Block |
| Cased Drill Holes | 15 | Horizontal Offset |
| Pumps, Compressors | 40 | Shaft Misalignment |

Human Response Criteria

| Level, Lv in VdB | Equivalent Noise Level, dBA | | Human Response |
|------------------|-----------------------------|------------------|--|
| | Low Freq (30 Hz) | Mid Freq (60 Hz) | |
| 65 | 25 | 40 | Approximate threshold of perception, low-freq inaudible, but mid-freq excessive for sleeping. Approx. dividing line between barely perceptible and distinctly perceptible. Annoying vibration for most people. Low-freq acceptable for sleeping areas. Mid-freq excessive in most quiet occupied space. Vibration tolerable only if infrequent number of events/day. Low-freq excessive for sleeping areas; mid-freq excessive even for infrequent events for some activities. |
| 75 | 35 | 50 | |
| 85 | 45 | 60 | |

Impact Criteria

| Land Use | Lv in VdB | | |
|---|---------------------------|-------------------------------|-----------------------------|
| | Frequent Events (70+/day) | Occasional Events (30-70/day) | Infrequent (<30 events/day) |
| Category 1: Vibration Sensitive | | | |
| Concert Halls | 65 | 65 | 65 |
| TV Studios | 65 | 65 | 65 |
| Recording Studios | 65 | 65 | 65 |
| Category 2: Residences, hotels, sleeping areas | 72 | 75 | 80 |
| Auditoriums | 72 | 80 | 80 |
| Theaters | 72 | 80 | 80 |
| Category 3: Institutional with primarily daytime use only (i.e. schools and churches) | 75 | 78 | 83 |

Vibration Source Levels For Construction Equipment

| Equipment | PPV at 25 ft (in/sec) | Approximate Lv at 25 feet * |
|--|-----------------------|-----------------------------|
| Impact Pile Driver - Upper Range | 1.518 | 112 |
| Impact Pile Driver - Typical | 0.644 | 104 |
| Sonic Pile Driver - Upper Range | 0.734 | 105 |
| Sonic Pile Driver - Typical | 0.17 | 93 |
| Clam Shovel Drop (slurry wall construction) | 0.202 | 94 |
| Hydromill (slurry wall construction) - in Soil | 0.008 | 66 |
| Hydromill (slurry wall construction) - in Rock | 0.017 | 75 |
| Vibratory Roller | 0.21 | 94 |
| Hoe Ram | 0.089 | 87 |
| Bulldozer - Large | 0.089 | 87 |
| Bulldozer - Small | 0.003 | 58 |
| Caisson Drilling | 0.089 | 87 |
| Loaded Trucks | 0.076 | 86 |
| Jackhammer | 0.035 | 79 |

Vibration Analysis - 300 Studebaker

$PPV \text{ (in/sec)} = PPV \text{ (ref)} * (25/D)^{1.5}$
 Where PPV = Peak Particle Velocity
 {ref} = PPV at the reference distance of 25 feet
 D = distance to the receptor

| | |
|--|-------------------------|
| Equipment = | Vibratory Roller |
| PPV{ref} = | 0.21 in/sec |
| D = | 575 feet |
| PPV at receptor = | 0.002 in/sec |
| PPV is 1.7x to 6x larger than RMS velocity | |
| Assume typical conversion factor of | 4 PPV:RMS |
| Therefore estimated RMS velocity = | 0.000 in/sec |
| Receptor Lv = | 54 VdB |

| | |
|--|--------------------------|
| Equipment = | Bulldozer - Large |
| PPV{ref} = | 0.089 in/sec |
| D = | 575 feet |
| PPV at receptor = | 0.001 in/sec |
| PPV is 1.7x to 6x larger than RMS velocity | |
| Assume typical conversion factor of | 4 PPV:RMS |
| Therefore estimated RMS velocity = | 0.000 in/sec |
| Receptor Lv = | 46 VdB |

| | |
|--|----------------------|
| Equipment = | Loaded Trucks |
| PPV{ref} = | 0.076 in/sec |
| D = | 575 feet |
| PPV at receptor = | 0.001 in/sec |
| PPV is 1.7x to 6x larger than RMS velocity | |
| Assume typical conversion factor of | 4 PPV:RMS |
| Therefore estimated RMS velocity = | 0.000 in/sec |
| Receptor Lv = | 45 VdB |

Source: Section 5 Transit Vibration
 Section 6 Vibration Impact Analysis
 Section 7 Noise and Vibration during Construction
Transit Noise and Vibration Assessment, September 2018
 John A. Volpe National Transportation Systems Center
 Prepared For: USDOT Federal Transit Administration

* RMS Velocity in decibels VdB with Vref of 1E-6 in/sec and PPV:RMS of -4

Criterion

| Building Damage | |
|---|-----|
| Type | VdB |
| Extremely susceptible to vibration damage | 90 |
| Non-engineered timber and masonry buildings | 94 |
| Engineered concrete and masonry buildings | 98 |
| Typical buildings | 100 |
| Reinforced concrete, steel, or timber buildings | 102 |

| Canmet, Bauer, and Calder, 1977 | | |
|---------------------------------|-----------------------|--------------------|
| Equipment | PPV Threshold, in/sec | Type of Damage |
| Rigid Mercury Switches | 0.5 | Trip Out |
| House | 2 | Cracked Plaster |
| Concrete Block | 8 | Crack in Block |
| Cased Drill Holes | 15 | Horizontal Offset |
| Pumps, Compressors | 40 | Shaft Misalignment |

Human Response Criteria

| Level, Lv in VdB | Equivalent Noise Level, dBA | | Human Response |
|------------------|-----------------------------|------------------|--|
| | Low Freq (30 Hz) | Mid Freq (60 Hz) | |
| 65 | 25 | 40 | Approximate threshold of perception, low-freq inaudible, but mid-freq excessive for sleeping. Approx. dividing line between barely perceptible and distinctly perceptible. Annoying vibration for most people. Low-freq acceptable for sleeping areas. Mid-freq excessive in most quiet occupied space. Vibration tolerable only if infrequent number of events/day. Low-freq excessive for sleeping areas; mid-freq excessive even for infrequent events for some activities. |
| 75 | 35 | 50 | |
| 85 | 45 | 60 | |

Impact Criteria

| Land Use | Lv in VdB | | |
|---|---------------------------|-------------------------------|-----------------------------|
| | Frequent Events (70+/day) | Occasional Events (30-70/day) | Infrequent (<30 events/day) |
| Category 1: Vibration Sensitive | | | |
| Concert Halls | 65 | 65 | 65 |
| TV Studios | 65 | 65 | 65 |
| Recording Studios | 65 | 65 | 65 |
| Category 2: Residences, hotels, sleeping areas | 72 | 75 | 80 |
| Auditoriums | 72 | 80 | 80 |
| Theaters | 72 | 80 | 80 |
| Category 3: Institutional with primarily daytime use only (i.e. schools and churches) | 75 | 78 | 83 |

Vibration Source Levels For Construction Equipment

| Equipment | PPV at 25 ft (in/sec) | Approximate Lv at 25 feet * |
|--|-----------------------|-----------------------------|
| Impact Pile Driver - Upper Range | 1.518 | 112 |
| Impact Pile Driver - Typical | 0.644 | 104 |
| Sonic Pile Driver - Upper Range | 0.734 | 105 |
| Sonic Pile Driver - Typical | 0.17 | 93 |
| Clam Shovel Drop (slurry wall construction) | 0.202 | 94 |
| Hydromill (slurry wall construction) - in Soil | 0.008 | 66 |
| Hydromill (slurry wall construction) - in Rock | 0.017 | 75 |
| Vibratory Roller | 0.21 | 94 |
| Hoe Ram | 0.089 | 87 |
| Bulldozer - Large | 0.089 | 87 |
| Bulldozer - Small | 0.003 | 58 |
| Caisson Drilling | 0.089 | 87 |
| Loaded Trucks | 0.076 | 86 |
| Jackhammer | 0.035 | 79 |

Vibration Analysis - 300 Studebaker Road

$$PPV \text{ (in/sec)} = PPV \text{ (ref)} * (25/D)^{1.5}$$

Where PPV = Peak Particle Velocity

{ref} = PPV at the reference distance of 25 feet

D = distance to the receptor

| | |
|---|---------------------|
| Equipment = Impact Pile Driver - Upper Range | |
| PPV{ref} = | 1.518 in/sec |
| D = | 175 feet |
| PPV at receptor = | 0.082 in/sec |
| PPV is 1.7x to 6x larger than RMS velocity | |
| Assume typical conversion factor of | 4 PPV:RMS |
| Therefore estimated RMS velocity = | 0.020 in/sec |
| Receptor Lv = | 86 VdB |

| | |
|---|---------------------|
| Equipment = Impact Pile Driver - Upper Range | |
| PPV{ref} = | 1.518 in/sec |
| D = | 575 feet |
| PPV at receptor = | 0.014 in/sec |
| PPV is 1.7x to 6x larger than RMS velocity | |
| Assume typical conversion factor of | 4 PPV:RMS |
| Therefore estimated RMS velocity = | 0.003 in/sec |
| Receptor Lv = | 71 VdB |

Source: Section 5 Transit Vibration
 Section 6 Vibration Impact Analysis
 Section 7 Noise and Vibration during Construction
Transit Noise and Vibration Assessment, September 2018
 John A. Volpe National Transportation Systems Center
 Prepared For: USDOT Federal Transit Administration

* RMS Velocity in decibels VdB with Vref of 1E-6 in/sec and PPV:RMS of ~4

Criterion

| Building Damage | |
|---|-----|
| Type | VdB |
| Extremely susceptible to vibration damage | 90 |
| Non-engineered timber and masonry buildings | 94 |
| Engineered concrete and masonry buildings | 98 |
| Typical buildings | 100 |
| Reinforced concrete, steel, or timber buildings | 102 |

| Canmet, Bauer, and Calder, 1977 | | |
|---------------------------------|-----------------------|--------------------|
| Equipment | PPV Threshold, in/sec | Type of Damage |
| Rigid Mercury Switches | 0.5 | Trip Out |
| House | 2 | Cracked Plaster |
| Concrete Block | 8 | Crack in Block |
| Cased Drill Holes | 15 | Horizontal Offset |
| Pumps, Compressors | 40 | Shaft Misalignment |

Human Response Criteria

| Level, Lv in VdB | Equivalent Noise Level, dBA | | Human Response |
|------------------|-----------------------------|------------------|---|
| | Low Freq (30 Hz) | Mid Freq (60 Hz) | |
| 65 | 25 | 40 | Approximate threshold of perception, low-freq inaudible, but mid-freq excessive for sleeping Approx. dividing line between barely perceptible and distinctly perceptible. Annoying vibration for most people. Low-freq acceptable for sleeping areas. Mid-freq excessive in most quiet occupied space. Vibration tolerable only if infrequent number of events/day. Low-freq excessive for sleeping areas; mid-freq excessive even for infrequent events for some activities. |
| 75 | 35 | 50 | |
| 85 | 45 | 60 | |

Impact Criteria

| Land Use | Lv in VdB | | |
|---|---------------------------|-------------------------------|-----------------------------|
| | Frequent Events (70+/day) | Occasional Events (30-70/day) | Infrequent (<30 events/day) |
| Category 1: Vibration Sensitive | 65 | 65 | 65 |
| Concert Halls | 65 | 65 | 65 |
| TV Studios | 65 | 65 | 65 |
| Recording Studios | 65 | 65 | 65 |
| Category 2: Residences, hotels, sleeping areas | 72 | 75 | 80 |
| Auditoriums | 72 | 80 | 80 |
| Theaters | 72 | 80 | 80 |
| Category 3: Institutional with primarily daytime use only (i.e. schools and churches) | 75 | 78 | 83 |

Vibration Source Levels For Construction Equipment

| Equipment | PPV at 25 ft (in/sec) | Approximate Lv at 25 feet * |
|--|-----------------------|-----------------------------|
| Impact Pile Driver - Upper Range | 1.518 | 112 |
| Impact Pile Driver - Typical | 0.644 | 104 |
| Sonic Pile Driver - Upper Range | 0.734 | 105 |
| Sonic Pile Driver - Typical | 0.17 | 93 |
| Clam Shovel Drop (slurry wall construction) | 0.202 | 94 |
| Hydromill (slurry wall construction) - in Soil | 0.008 | 66 |
| Hydromill (slurry wall construction) - in Rock | 0.017 | 75 |
| Vibratory Roller | 0.21 | 94 |
| Hoe Ram | 0.089 | 87 |
| Bulldozer - Large | 0.089 | 87 |
| Bulldozer - Small | 0.003 | 58 |
| Caisson Drilling | 0.089 | 87 |
| Loaded Trucks | 0.076 | 86 |
| Jackhammer | 0.035 | 79 |

Table A: Long Beach Business Park Traffic Study: Non-PCE Traffic Volumes

(For purposes of Noise Analysis)

| Intersection 1: Loynes and Studebaker | | | | | | | | | | | | | | |
|---|--------------------------------|-----|------|-----|-----|------|-----|-----|-----|-----|-----|-----|-------|------|
| | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | Total | |
| 1 | Existing (2018) | 72 | 1281 | 0 | 0 | 946 | 287 | 363 | 0 | 101 | 0 | 0 | 0 | 3050 |
| 2 | Build-Out (2020) | 74 | 1346 | 0 | 0 | 1009 | 296 | 374 | 0 | 104 | 0 | 0 | 0 | 3203 |
| 3 | Existing Plus Project: | 72 | 1282 | 5 | 25 | 946 | 287 | 363 | 5 | 101 | 1 | 1 | 5 | 3093 |
| 4 | Build-Out Plus Project (2020): | 74 | 1347 | 5 | 25 | 1009 | 296 | 374 | 5 | 104 | 1 | 1 | 5 | 3246 |
| Intersection 2: Studebaker & Proposed RIRO Driveway 2 | | | | | | | | | | | | | | |
| | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | Total | |
| 1 | Existing (2018) | 0 | 1644 | 0 | 0 | 1233 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2877 |
| 2 | Build-Out (2020) | 0 | 1720 | 0 | 0 | 1304 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3024 |
| 3 | Existing Plus Project: | 0 | 1649 | 1 | 0 | 1258 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2909 |
| 4 | Build-Out Plus Project (2020): | 0 | 1725 | 1 | 0 | 1329 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3056 |
| Intersection 1: Loynes and Studebaker | | | | | | | | | | | | | | |
| | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | Total | |
| 1 | Existing (2018) | 120 | 1463 | 0 | 0 | 1175 | 571 | 326 | 0 | 92 | 0 | 0 | 0 | 3747 |
| 2 | Build-Out (2020) | 124 | 1567 | 0 | 0 | 1284 | 588 | 336 | 0 | 95 | 0 | 0 | 0 | 3994 |
| 3 | Existing Plus Project: | 120 | 1463 | 1 | 7 | 1175 | 571 | 326 | 2 | 92 | 6 | 6 | 22 | 3791 |
| 4 | Build-Out (2020) Plus Project: | 124 | 1567 | 1 | 7 | 1284 | 588 | 336 | 2 | 95 | 6 | 6 | 22 | 4038 |
| Intersection 2: Studebaker & Proposed RIRO Driveway 2 | | | | | | | | | | | | | | |
| | NBL | NBT | NBR | SBL | SBT | SBR | EBL | EBT | EBR | WBL | WBT | WBR | Total | |
| 1 | Existing (2018) | 0 | 1788 | 0 | 0 | 1746 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3534 |
| 2 | Build-Out (2020) | 0 | 1902 | 0 | 0 | 1872 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3774 |
| 3 | Existing Plus Project: | 0 | 1810 | 0 | 0 | 1753 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3566 |
| 4 | Build-Out (2020) Plus Project: | 0 | 1924 | 0 | 0 | 1879 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3806 |

Intersection Scenario Volumes

AM



PM



Note:

right in right out = RIRO

Source: LSA, April 2019