APPENDIX E

Noise Modeling and Results
## Appendix B

**Traffic Noise Prediction Model, (FHWA RD-77-108)**

### Model Input Sheet

**Project Name:** Amador County GP Update  
**Project Number:** 06110052.01  
**Modeling Condition:** Baseline 2013  
**Ground Type:** Soft  
**Metric (L_{eq}, L_{dn}, CNEL):** L_{dn}  
**K Factor:**  
**Traffic Desc. (Peak or ADT):** ADT

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<th>Traffic Vol.</th>
<th>Speed (Mph)</th>
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## Predicted Noise Levels

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**Project Number:** 06110052.01  
**Modeling Condition:** Baseline 2013  
**Metric (Leq, Ldn, CNEL):** Ldn

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**Appendix B**  
Traffic Noise Prediction Model, (FHWA RD-77-108)
## Traffic Noise Prediction Model, (FHWA RD-77-108)

### Model Input Sheet

**Project Name:** Amador County GP Update  
**Project Number:** 06110052.01  
**Modeling Condition:** Baseline 2013  
**Ground Type:** Soft  
**Metric ($L_{dn}$, $L_{dn}$, CNEL):** $L_{dn}$  
**Traffic Desc. (Peak or ADT):** ADT

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## Appendix E

### Traffic Noise Prediction Model, (FHWA RD-77-108)

**Predicted Noise Levels**

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<td>24 dB 51 dB 110 dB 236 dB 509 dB</td>
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### Appendix E

**Traffic Noise Prediction Model, (FHWA RD-77-108)**

**Model Input Sheet**

- **Project Name**: Amador County GP Update
- **Project Number**: 06110052.01
- **Modeling Condition**: Baseline 2006
- **Ground Type**: Soft
- **Metric (Leq, Ldn, CNEL)**: Ldn
- **K Factor**: ADT

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<th>% HT</th>
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## Appendices

### Traffic Noise Prediction Model, (FHWA RD-77-108)

**Predicted Noise Levels**

**Project Name:** Amador County GP Update  
**Project Number:** 06110052.01  
**Modeling Condition:** Baseline 2006  
**Metric (Leq, Ldn, CNEL):** Ldn

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### Traffic Noise Prediction Model, (FHWA RD-77-108)

**Model Input Sheet**

- **Project Name:** Amador County GP Update
- **Project Number:** 06110052.01
- **Modeling Condition:** Baseline 2006
- **Ground Type:** Soft
- **Metric** \( (L_{eq}, L_{dn}, CNEL) \): \( L_{dn} \)
- **Traffic Desc. (Peak or ADT):** ADT

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<th>%MT</th>
<th>% HT</th>
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### Project Name: Amador County GP Update

### Project Number: 06110052.01

### Modeling Condition: Baseline 2006

### Metric (Leq, Ldn, CNEL): Ldn

#### Segment Roadway From To Auto MT HT Total 70 dB 65 dB 60 dB 55 dB 50 dB

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<th>To</th>
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## Appendix E

### Traffic Noise Prediction Model, (FHWA RD-77-108)

#### Model Input Sheet

**Project Name:** Amador County GP Update  
**Project Number:** 06110052.01  
**Modeling Condition:** Proposed Project 2030  
**Ground Type:** Soft  
**Metric ($L_{eq}, L_{dn}, CNEL$):** Ldn

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## Predicted Noise Levels

**Project Name:** Amador County GP Update  
**Project Number:** 06110052.01  
**Modeling Condition:** Proposed Project 2030  
**Metric (Leq, Ldn, CNEL):** Ldn

### Traffic Noise Prediction Model, (FHWA RD-77-108)

#### Appendix E

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<th>HT</th>
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## Appendix E

**Traffic Noise Prediction Model, (FHWA RD-77-108)**

Model Input Sheet

**Project Name:** Amador County GP Update  
**Project Number:** 06110052.01  
**Modeling Condition:** Proposed Project 2030  
**Ground Type:** Soft  
**Metric ($k_{eq}, k_{dn}, CN_{EL}$):** $L_{dn}$  
**K Factor:**  
**Traffic Desc. (Peak or ADT):** ADT

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<th>Distance to CL (ft)</th>
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<th>% MT</th>
<th>% HT</th>
<th>Day %</th>
<th>Eve %</th>
<th>Night %</th>
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### Appendix E

**Traffic Noise Prediction Model, (FHWA RD-77-108)**

**Predicted Noise Levels**

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<th>To</th>
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## Traffic Noise Prediction Model, (FHWA RD-77-108)

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# Appendix E

## Traffic Noise Prediction Model, (FHWA RD-77-108)

**Model Input Sheet**

**Project Name:** Amador County GP Update

**Project Number:** 06110052.01

**Modeling Condition:** Proposed Project 2030

**Ground Type:** Soft

**Metric (L_{eq}, L_{dn}, CNEL):** L_{dn}

**K Factor:**

**Traffic Desc. (Peak or ADT):** ADT

<table>
<thead>
<tr>
<th>Segment</th>
<th>Roadway From</th>
<th>Roadway To</th>
<th>Speed (Mph)</th>
<th>Distance to CL (ft)</th>
<th>% Autos</th>
<th>% MT</th>
<th>% HT</th>
<th>Day %</th>
<th>Eve %</th>
<th>Night %</th>
<th>Offset (dB)</th>
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### Traffic Noise Prediction Model, (FHWA RD-77-108)

**Predicted Noise Levels**

**Appendix E**

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<tr>
<th>Segment</th>
<th>Roadway From</th>
<th>Roadway To</th>
<th>Noise Levels, dB Ldn</th>
<th>Distance to Traffic Noise Contours, Feet</th>
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**Project Name**: Amador County GP Update

**Project Number**: 06110052.01

**Modeling Condition**: Proposed Project 2030

**Metric (Leq, Ldn, CNI)**
## Appendix E

### Truck Percentage Calculations - Caltrans

<table>
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<th>RTE</th>
<th>DIST</th>
<th>CNTY</th>
<th>POST MILE</th>
<th>DESCRIPTION</th>
<th>VEHICLE AADT</th>
<th>TRUCK AADT</th>
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<tr>
<td></td>
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<td></td>
<td></td>
<td>TOTAL</td>
<td>By Axle</td>
<td>Directional Average</td>
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<td>2 3 4 5+ MT</td>
<td>HT</td>
<td>MT HT</td>
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|     | 10   | AMA  | 9.093    | JCT. RTE. 124 SOUTH | 8700 | 211 145 32 283 | 2.4% 5.3% | 2.4% 5.2% |
| 16  | 10   | AMA  | 9.373    | CENTRAL HOUSE, JCT. RTE. 49 | 9900 | 236 163 35 317 | 2.4% 5.2% |
| 26  | 10   | AMA  | 4.644    | JCT. RTE. 88 | 2300 | 12 48 5 74 | 0.5% 5.5% | 0.5% 5.5% |
| 49  | 10   | AMA  | 4.029    | JACKSON, SOUTH JCT. RTE. 88 | 18000 | 603 359 75 619 | 3.4% 5.9% | 2.5% 5.6% |
| 49  | 10   | AMA  | 5.934    | MARTELL, NORTH JCT. RTE. 88 WEST | 18100 | 427 331 53 491 | 2.4% 4.8% | 2.0% 4.4% |
| 49  | 10   | AMA  | 5.934    | MARTELL, NORTH JCT. RTE. 88 WEST | 12000 | 196 182 46 248 | 1.6% 4.0% |
| 49  | 10   | AMA  | 6.98     | SUTER CREEK, JCT. RTE. 104 WEST | 11400 | 210 328 72 302 | 1.8% 6.2% | 1.7% 6.2% |
| 49  | 10   | AMA  | 22.116   | AMADOR/EL DORADO COUNTY LINE | 2200 | 152 18 7 32 | 6.9% 2.6% | 6.9% 2.6% |
| 88  | 10   | AMA  | 5.527    | JCT. RTE. 124 NORTH | 9900 | 132 177 27 515 | 1.3% 7.3% | 1.2% 6.8% |
| 88  | 10   | AMA  | 7.389    | WEST JCT. RTE. 104 | 13600 | 38 95 20 160 | 0.3% 2.0% | 0.3% 2.0% |
| 88  | 10   | AMA  | 14.25    | JCT. RTE. 49 | 15200 | 275 297 26 300 | 1.8% 4.1% | 1.6% 4.1% |
| 88  | 10   | AMA  | 14.292   | JCT. RTE. 49 | 10900 | 161 203 37 200 | 1.5% 4.0% |
| 88  | 10   | AMA  | 22.69    | PINE GROVE, RIDGE ROAD | 13500 | 214 309 42 381 | 1.6% 5.4% | 1.4% 5.0% |
| 88  | 10   | AMA  | 22.69    | PINE GROVE, RIDGE ROAD | 22500 | 258 325 46 676 | 1.1% 4.7% |
| 88  | 10   | AMA  | R26.791  | JCT RTE 26, RED CORRAL RD | 10200 | 167 149 16 433 | 1.6% 5.9% | 1.7% 5.8% |
| 88  | 10   | AMA  | R26.791  | JCT RTE 26, RED CORRAL RD | 8100 | 142 120 11 334 | 1.8% 5.7% |
| 104 | 10   | AMA  | R5.766   | IONE, JCT. RTE. 124 NORTH | 8700 | 99 189 27 338 | 1.1% 6.4% | 1.4% 5.5% |
| 104 | 10   | AMA  | R5.766   | IONE, JCT. RTE. 124 NORTH | 10900 | 178 165 28 304 | 1.6% 4.6% |
| 104 | 10   | AMA  | R5.96    | IONE, JCT. RTE. 124 SOUTH | 5200 | 81 92 15 145 | 1.6% 4.8% | 1.6% 4.8% |
| 104 | 10   | AMA  | R8.201   | JCT. RTE. 88 | 4550 | 48 83 9 50 | 1.1% 3.1% | 1.4% 3.8% |
| 104 | 10   | AMA  | 8.386    | JCT. RTE. 88 | 7100 | 117 184 18 115 | 1.6% 4.5% |
| 104 | 10   | AMA  | 10.072   | SUTTER CREEK, JCT. RTE. 49 | 5700 | 95 123 14 281 | 1.7% 7.3% | 1.7% 7.3% |
| 124 | 10   | AMA  | 0        | JCT. RTE. 88, IONE SOUTH | 2900 | 52 38 7 147 | 1.8% 6.6% | 1.8% 6.6% |
| 124 | 10   | AMA  | 2.291    | IONE, WEST JCT RTE 104 | 3600 | 63 62 13 178 | 1.8% 7.0% | 1.6% 5.3% |
| 124 | 10   | AMA  | R2.291   | IONE, WEST JCT RTE 104 | 2900 | 41 49 7 47 | 1.4% 3.6% |
**Appendix E**

Long-Term 24 Hour Continuous Noise Monitoring
Model Input Sheet

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### Project:

### Date:

### Site:

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#### Percentage of Energy

- **Daytime**: 90%
- **Nighttime**: 10%

#### Calculated L_{eq}, dBA

47.6
### Appendix E

**Long-Term 24 Hour Continuous Noise Monitoring**

**Model Input Sheet**

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Appendix E
Long-Term 24 Hour Continuous Noise Monitoring
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Daytime (7 a.m. - 10 p.m.)
Nighttime (10 p.m. - 7 a.m.)

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Daytime (7 a.m. - 10 p.m.)
Nighttime (10 p.m. - 7 a.m.)

Averages

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Calculated $L_{dn}$, dBA

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<td>0:00:00</td>
<td>48.81</td>
<td>72.73</td>
<td>34.39</td>
<td>31.8</td>
</tr>
<tr>
<td>1:00:00</td>
<td>44.13</td>
<td>70.18</td>
<td>33.69</td>
<td>30.99</td>
</tr>
<tr>
<td>2:00:00</td>
<td>36.45</td>
<td>55.52</td>
<td>33.59</td>
<td>30.75</td>
</tr>
<tr>
<td>3:00:00</td>
<td>37.78</td>
<td>55.49</td>
<td>33.24</td>
<td>31.27</td>
</tr>
<tr>
<td>4:00:00</td>
<td>41.33</td>
<td>58.6</td>
<td>37.47</td>
<td>32.67</td>
</tr>
<tr>
<td>5:00:00</td>
<td>52.92</td>
<td>76.2</td>
<td>44.64</td>
<td>41.27</td>
</tr>
<tr>
<td>6:00:00</td>
<td>60.56</td>
<td>80.56</td>
<td>49.44</td>
<td>43.82</td>
</tr>
<tr>
<td>7:00:00</td>
<td>64.76</td>
<td>85.69</td>
<td>52.92</td>
<td>47.09</td>
</tr>
<tr>
<td>8:00:00</td>
<td>60.71</td>
<td>81.2</td>
<td>51.06</td>
<td>45.7</td>
</tr>
<tr>
<td>9:00:00</td>
<td>63.7</td>
<td>84.64</td>
<td>60.29</td>
<td>44.65</td>
</tr>
<tr>
<td>10:00:00</td>
<td>62.39</td>
<td>76.54</td>
<td>60.67</td>
<td>55.44</td>
</tr>
</tbody>
</table>

### Uppermost-Level

**Daytime (7 a.m. - 10 p.m.)**

<table>
<thead>
<tr>
<th>Leq</th>
<th>Lmax</th>
<th>L50</th>
<th>L90</th>
</tr>
</thead>
<tbody>
<tr>
<td>65.4</td>
<td>88.1</td>
<td>62.0</td>
<td>56.9</td>
</tr>
</tbody>
</table>

**Nighttime (10 p.m. - 7 a.m.)**

<table>
<thead>
<tr>
<th>Leq</th>
<th>Lmax</th>
<th>L50</th>
<th>L90</th>
</tr>
</thead>
<tbody>
<tr>
<td>60.6</td>
<td>80.6</td>
<td>49.4</td>
<td>43.8</td>
</tr>
</tbody>
</table>

### Percentage of Energy

- **Daytime**: 94%
- **Nighttime**: 6%

### Calculated L_{eq}, dBA

62.7
Instruction sheet for using the FRA horn noise model.

Only cells in blue can be changed. The rest of the spreadsheet is locked and is not to be altered by the user. The four cells in dark blue can be changed, but they contain formulas critical to the operation of the spreadsheet. If they are changed, do not save the spreadsheet (or save it under a different name) or the formulas will be lost. Note that the spreadsheet may take a few seconds to update after any changes to the input (especially with slower computers).

1 Noise Situation: Use the lookup table to specify the horn sounding condition of interest.

2 Horn Lmax: The maximum A-weighted sound level of the train horn at 100 feet from the front of the train.
   If your Lmax is not at 100 feet, use the following converter to get the Lmax at 100 feet.

   | Your Lmax | Your distance | Lmax at 100 feet |
   | 65 dBA    | 50 feet      | 104 dBA         |

3 Horn Location on Locomotive: Use the lookup table to specify the location of the horns on the locomotives.
   There are 4 options:
   1 National average. Use this if the mix of horns is not known. It represents the national average of several thousand locomotives.
   2 All front mounted: All the horns are located at the front of the locomotive.
   3 All middle mounted: All the horns are mounted in the middle of the locomotive.
   4 User defined percentage: If there is detailed knowledge about the horn location mix, use this and input the percentage of the front mounted horns in the blue input box in the lookup table.

4 Non Train Noise Environment: This represents the noise environment without any train noise (the background noise). Use the lookup table to determine the type of noise environment. A specific noise environment can be input, if the data is available. The values used for the non train noise environment are as follows:
   Urban: 65 dBA Ldn
   Suburban: 55 dBA Ldn
   Rural: 45 dBA Ldn

5 Shielding: Use the lookup table to specify the type of shielding by the type of area where the grade crossing is located. Near grade crossings, shielding is generally provided by rows of buildings. Using no shielding is not recommended.

6 Length of Impact Area: This determines the length of the impact area along the tracks. The default is 1/4 mile. The 20 second and 15 second options calculate the distance based on the speed of the train, up to a maximum of 1/4 mile for higher speed trains.

7 Train Speed: The speed of the train, in miles per hour. There are separate entries for existing and future trains.

8 Existing and future numbers of Trains: Use this to input the number of trains at the crossing. You should input the number of trains in one direction only, do not sum both directions. The split between day and night trains assumes an even distribution over the entire 24 hours of the day. Night is considered to be 10 pm to 7 am and day is 7 am to 10 pm. The user can input specific numbers for the day and night trains in the dark blue boxes if the split is not uniform (for commuter rail systems, as an example), but do not save the spreadsheet (or save it as a different name) or the formulas in those boxes will be lost. If you do lose the formulas, the following are the formulas you should use in those four cells.
   Cell C14: +C12*15/24
   Cell C15: +C13*15/24
   Cell C16: +C12*9/24
   Cell C17: +C13*9/24

9 Number of Cars: Enter the average number of cars, for both the existing and future cases.

10 Number of Locomotives: Enter the average number of locomotives, for both the existing and future cases.

11 Numeric Output: These two tables give the numeric output of the program. All distances are in feet.
   Ldn 65 Contours Numeric Output: The first two numbers represent the distance perpendicular to the tracks to the Ldn 65 contour at the crossing, for both the existing and future conditions. The next two numbers represent the distance perpendicular to the tracks to the Ldn 65 contour at the halfway point of the horn zone. The final two numbers represent the distances along the track that define the half and full impact zone lengths.
   Impact Zones Numeric Output: The first two numbers represent the distance perpendicular to the tracks to impact and severe impact at the crossing. The next two numbers represent the distance perpendicular to the tracks to the impact and severe impact at the halfway point of the horn zone. The final two numbers represent the distances along the track that define the half and full impact zone lengths.

12 Graphs: The graphs provide a visual means of comparing changes in the input parameters. Both scales remain constant, so you can do relative comparisons.

   The Ldn 65 graph shows the existing (in blue) and the future (in red) Ldn 65 contours for the data provided by the user.

   The Impact graph shows the impact (in blue) and the severe impact (in red) for the data provided by the user.
FRA Grade Crossing Noise Model

**User Input**
- Noise Situation (Pick from List) 1
- Horn Lmax (dBA) @ 100 feet 104
- Horn Location on Locomotive (Pick from List) 1
- Non Train Noise Environment (pick from list) 3
- Shielding (Pick from List) 5
- Length of Impact Area (pick from list) 1
- Existing Train Speed (mph) 50
- Existing Number of Day Trains (7 am to 10 p.m.) 2.5
- Existing Average Number of Cars 40
- Future Average Number of Cars 40
- Future Average Number of Locomotives 2

**Noise Situation**
- Horns Existing and Future 1
- Horns in Future Only 2
- No Horns Existing and Future 3
- Horn Location on Locomotive 1
- Non Train Noise Environment 3

**Shielding**
- Dense Urban 1
- Light Urban 2
- Dense Suburban 3
- Light Suburban 4
- Rural 5
- No Shielding 6

**Ldn 65 Contours Numeric Output (in feet)**
- Existing 65 Ldn Contour at X-ing 325
- Future 65 Ldn Contour at X-ing 325
- Existing 65 Ldn Contour at 1/2 zone length 255
- Future 65 Ldn Contour at 1/2 zone length 255

**Length of Impact Area**
- 1/4 mile 1
- 20 seconds 2
- 15 seconds 3

**Impact Zones Numeric Output (in feet)**
- Impact Distance at X-ing 0
- Severe Impact Distance at X-ing 0
- Impact Distance at 1/2 zone length 0
- Severe Impact Distance at 1/2 zone length 0
- Zone Length 1320
- 1/2 Zone Length 660

**Non Train Noise Environment**
- National Average (50% front, 50% middle) 1
- User Defined 4
- % front mounted horns 4

**Other Input**
- User Defined Ldn = 50 dBA 4
Instruction sheet for using the FRA horn noise model.

1 Noise Situation: Use the lookup table to specify the horn sounding condition of interest.

2 Horn Lmax: The maximum A-weighted sound level of the train horn at 100 feet from the front of the train.

<table>
<thead>
<tr>
<th>Your Lmax</th>
<th>110 dBA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your distance</td>
<td>50 feet</td>
</tr>
<tr>
<td>Lmax at 100 feet</td>
<td>104 dBA</td>
</tr>
</tbody>
</table>

3 Horn Location on Locomotive: Use the lookup table to specify the location of the horns on the locomotive.

   There are 4 options:
   1 National average. Use this if the mix of horns is not known. It represents the national average of several thousand locomotives.
   2 All front mounted: All the horns are located at the front of the locomotive.
   3 All middle mounted: All the horns are mounted in the middle of the locomotive.
   4 User defined percentage: If there is detailed knowledge about the horn location mix, use this and input the percentage of the front mounted horns in the blue input box in the lookup table.

4 Non Train Noise Environment: This represents the noise environment without any train noise (the background noise). Use the lookup table to determine the type of noise environment. A specific noise environment can be input, if the data is available. The values used for the non train noise environment are as follows:

   | Urban | 65 dBA Ldn |
   | Suburban | 55 dBA Ldn |
   | Rural | 45 dBA Ldn |

5 Shielding: Use the lookup table to specify the type of shielding by the type of area where the grade crossing is located.

   Near grade crossings, shielding is generally provided by rows of buildings. Using no shielding is not recommended.

6 Length of Impact Area: This determines the length of the impact area along the tracks. The default is 1/4 mile. The 20 second and 15 second options calculate the distance based on the speed of the train, up to a maximum of 1/4 mile for higher speed trains.

7 Train Speed: The speed of the train, in miles per hour. There are separate entries for existing and future trains.

8 Existing and future numbers of Trains: Use this to input the number of trains at the crossing. You should input the number of trains in one direction only, do not sum both directions. The split between day and night trains assumes an even distribution over the entire 24 hours of the day. Night is considered to be 10 pm to 7 am and day is 7 am to 10 pm. The user can input specific numbers for the day and night trains in the dark blue boxes if the split is not uniform (for commuter rail systems, as an example), but do not save the spreadsheet (or save it as a different name) or the formulas in those boxes will be lost. If you do lose the formulas, the following are the formulas you should use in those four cells:

   Cell C14: +C12*15/24
   Cell C15: +C13*15/24
   Cell C16: +C12*9/24
   Cell C17: +C13*9/24

9 Number of Cars: Enter the average number of cars, for both the existing and future cases.

10 Number of Locomotives: Enter the average number of locomotives, for both the existing and future cases.

11 Numeric Output: These two tables give the numeric output of the program. All distances are in feet.

   | Ldn 65 Contours Numeric Output: The first two numbers represent the distance perpendicular to the tracks to the Ldn 65 contour at the crossing, for both the existing and future conditions. The next two numbers represent the distance perpendicular to the tracks to the Ldn 65 contour at the halfway point of the horn zone. The final two numbers represent the distances along the track that define the half and full impact zone lengths. |
   | Impact Zones Numeric Output: The first two numbers represent the distance perpendicular to the tracks to impact and severe impact at the crossing. The next two numbers represent the distance perpendicular to the tracks to impact and severe impact at the halfway point of the horn zone. The final two numbers represent the distances along the track that define the half and full impact zone lengths. |

12 Graphs: The graphs provide a visual means of comparing changes in the input parameters. Both scales remain constant, so you can do relative comparisons.

   The Ldn 65 graph shows the existing (in blue) and the future (in red) Ldn 65 contours for the data provided by the user.
   The Impact graph shows the impact (in blue) and the severe impact (in red) for the data provided by the user.
### FRA Grade Crossing Noise Model

<table>
<thead>
<tr>
<th>User Input</th>
<th>Noise Situation</th>
<th>Shielding</th>
<th>Ldn 65 Contours Numeric Output (in feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise Situation (Pick from List)</td>
<td>Horns Existing and Future</td>
<td>Dense Urban</td>
<td>Existing 65 Ldn Contour at X-ing 137</td>
</tr>
<tr>
<td>Horn Lmax (dBA) @ 100 feet</td>
<td>Horns in Future Only</td>
<td>Light Urban</td>
<td>Future 65 Ldn Contour at X-ing 137</td>
</tr>
<tr>
<td>Horn Location on Locomotive (Pick from List)</td>
<td>No Horns Existing and Future</td>
<td>Dense Suburban</td>
<td>Existing 65 Ldn Contour at 1/2 zone length 137</td>
</tr>
<tr>
<td>Non Train Noise Environment (pick from list)</td>
<td></td>
<td>Light Suburban</td>
<td>Future 65 Ldn Contour at 1/2 zone length 137</td>
</tr>
<tr>
<td>Shielding (Pick from List)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length of Impact Area (pick from list)</td>
<td>National Average (50% front, 50% middle)</td>
<td>No Shielding</td>
<td></td>
</tr>
<tr>
<td>Existing Train Speed (mph)</td>
<td>All Front Mounted</td>
<td></td>
<td>Zone Length 1320</td>
</tr>
<tr>
<td>Future Train Speed (mph)</td>
<td>All Middle Mounted</td>
<td></td>
<td>1/2 Zone Length 660</td>
</tr>
<tr>
<td>Number of Existing Trains in one Direction</td>
<td>User Defined</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non Train Noise Environment</td>
<td>80% front mounted horns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Future Trains in one Direction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Existing Number of Day Trains (7 am to 10 p.m.)</td>
<td>2.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Future Number of Day Trains (7 am to 10 p.m.)</td>
<td>2.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Existing Number of Night Trains (10 p.m. to 7 am)</td>
<td>1.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Future Number of Night Trains (10 p.m. to 7 am)</td>
<td>1.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Existing Average Number of Cars</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Future Average Number of Cars</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Existing Average Number of Locomotives</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Future Average Number of Locomotives</td>
<td>2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Ldn 65 Contours

![Ldn 65 Contours Diagram](attachment:ldn_65_contours.png)

### Impact Zones

![Impact Zones Diagram](attachment:impact_zones.png)
### Project-Generated Construction Source Vibration Prediction Model
San Joaquin River Restoration Program

<table>
<thead>
<tr>
<th>Location</th>
<th>Distance to Nearest Receiver in feet</th>
<th>Predicted Vibration Level (PPV)</th>
<th>Predicted Vibration Level (VdB)</th>
<th>Equipment</th>
<th>Reference Distance 25 feet (in/sec)¹</th>
<th>Approximate Lv (VdB) at 25 feet²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reach 1A</td>
<td>1000</td>
<td>0.038</td>
<td>79.5</td>
<td>Quarry Blasting</td>
<td>46</td>
<td>3.83</td>
</tr>
</tbody>
</table>

Sources:
¹ Where PPV is the peak particle velocity
² Where Lv is the RMS velocity expressed in vibration decibels (VdB), assuming a crest factor of 4.

Source: Caltrans 2002, FTA 2006
## Project-Generated Construction Source Vibration Prediction Model

**CDCR DeWitt**

<table>
<thead>
<tr>
<th>Location</th>
<th>Distance to Nearest Receiver in feet</th>
<th>Predicted Vibration Level (PPV)</th>
<th>Predicted Vibration Level (VdB)</th>
<th>Equipment</th>
<th>Reference Distance</th>
<th>PPV at 25 feet (in/sec)¹</th>
<th>Approximate Lv (VdB) at 25 feet²</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-Site Receiver</td>
<td>45</td>
<td>0.0369</td>
<td>79.3</td>
<td>Large Bulldozer</td>
<td>25</td>
<td>0.089</td>
<td>87</td>
</tr>
</tbody>
</table>

Sources:

¹ Where PPV is the peak particle velocity

² Where Lv is the RMS velocity expressed in vibration decibels (VdB), assuming a crest factor of 4.

Source: Caltrans 2002, FTA 2006