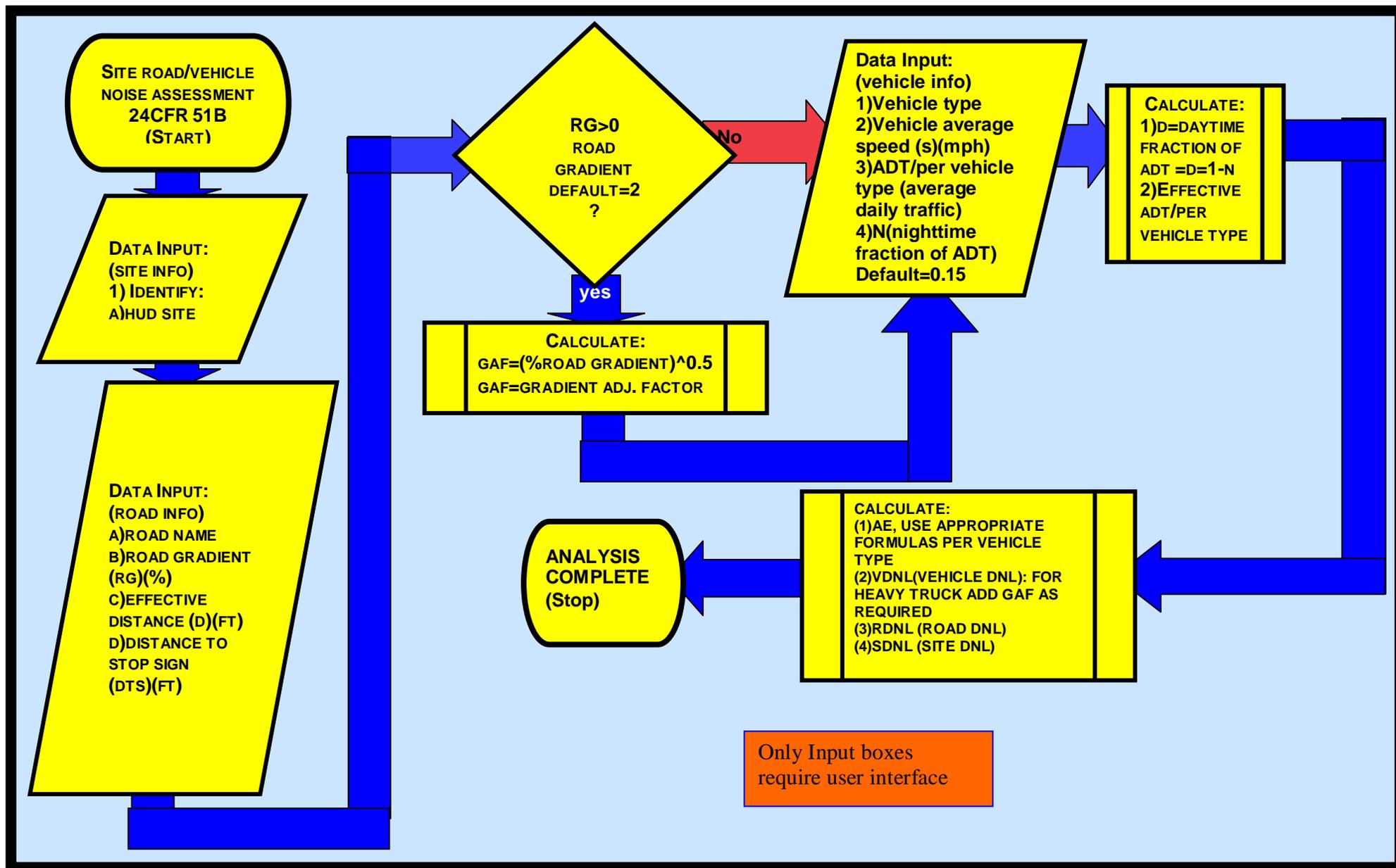
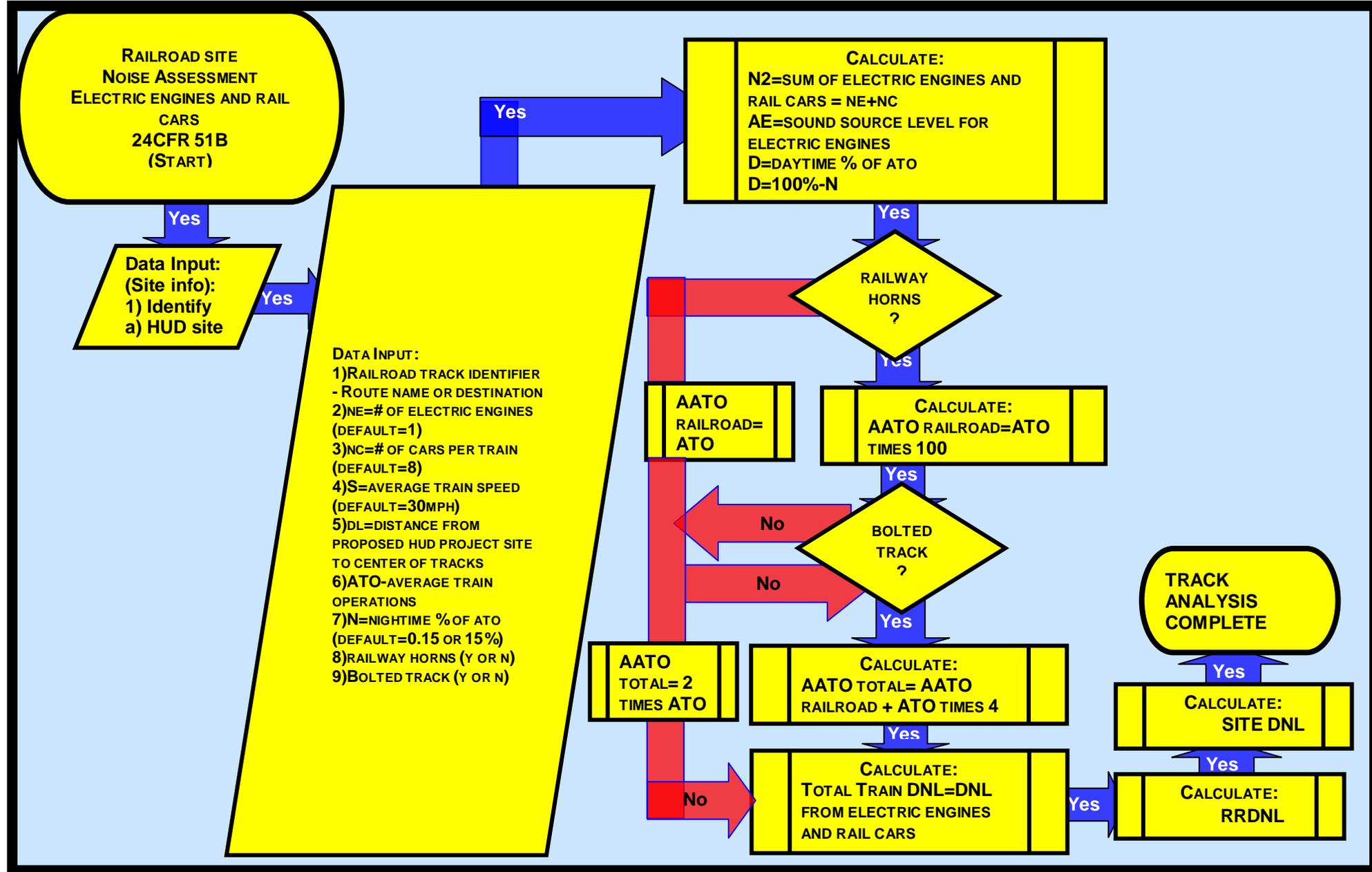


Algorithm for Calculation of Site road/vehicle noise assessment, in accordance with 24 CFR Part 51. Sound source level for automobiles =  $AE = 64.6 + 20 \cdot \log_{10}[S] - 15 \cdot \log_{10}[D]$ , Sound source level for medium sized trucks =  $AE = 74.6 + 20 \cdot \log_{10}[S] - 15 \cdot \log_{10}[D]$ , Heavy trucks when  $S \leq 50$  mph,  $AE = 114.5 - 15 \cdot \log_{10}[D]$ , Heavy trucks when  $S > 50$  mph,  $AE = 80.5 + 20 \cdot \log_{10}[S] - 15 \cdot \log_{10}[D]$ . Day/Night Automobile Sound Level =  $DNL = AE + 10 \cdot \log_{10}[EADT \cdot (d + 10 \cdot n)] - 49.4$ , where  $d$  = daytime fraction of ADT,  $n$  = night time fraction of ADT,  $d = 1 - n$ ; ADT = Average Daily Traffic, EADT = Effective Average Daily Traffic. EADT for heavy trucks =  $ADT \cdot (\text{factor from table\#8-HUD noise guidebook})$ , EADT for medium sized trucks =  $ADT \cdot 10 \cdot \text{DTS equation}$ , EADT for cars =  $ADT \cdot \text{DTS equation}$ , DTS equation (distance to stop sign equation) =  $0.1 + 0.9 \cdot (DTS/600)$ , DTS = distance from the proposed HUD site to stop sign; Gradient Adjustment Factor for DNL determination on heavy trucks (GAF) =  $(\% \text{ Road Gradient})^{0.5}$  - **REVISED -1-14-08**



Algorithm for Calculation of Day-Night locomotive sound levels, in accordance with 24 CFR Part 51B. Sound source level for electric engines and rail cars =  $AE = 71.4 + 20 * \text{Log}_{10}[S] + 10 * \text{Log}_{10}[N2] - 15 * \text{Log}_{10}[D]$ .  $N2 = ne + nc$ , where  $ne$  = # of electric engines and  $nc$  = # of cars. Note: An electric engine is counted as a rail car. Adjusted Average Train Operations (Railroad) =  $AATO_r$  = Average Train Operations (ATO) times 100. Adjusted Average Train Operations (Total) =  $AATO_{total} = AATO_{(railroad)} + AATO$  times 4. Day/Night Electric Engine and Rail Car Sound Level =  $DNL = AE + 10 * \text{Log}_{10}[AATO_{total} * (d + 10 * N)] - 49.4$ , where  $d$  = daytime percent use of AATO,  $N$  = night time percent use of AATO,  $D = 100\% - N$  - RRDNL = Rail Road DNL **REVISED - 12-17-08**



Algorithm for Calculation of Day-Night locomotive sound levels, in accordance with 24 CFR Part 51B. Sound source level for diesel engines =  $AE = 141.7 - 10 * \log_{10}[S] + 10 * \log_{10}[N1] - 15 * \log_{10}[DI]$ . Sound source level for rail cars =  $AE = 71.4 + 20 * \log_{10}[S] + 10 * \log_{10}[N2] - 15 * \log_{10}[DI]$ . Adjusted Average Train Operations (Engines) =  $AATOE = \text{Average Train Operations (ATO) times } 10$ . Adjusted Average Train Operations (Rail cars) =  $AATOC = \text{Average Train Operations (ATO) times } 4$ . Day/Night Diesel Engine (DNLe) or Rail Car (DNLc) Sound Level =  $AE + 10 * \log_{10}[AATO(\text{car or engine}) * (D + 10 * N)] - 49.4$ , where D = daytime percent use of AATO, N = night time percent use of AATO,  $D = 100\% - N$  - RRDNL = Rail Road DNL REVISIED - 12-17-08

