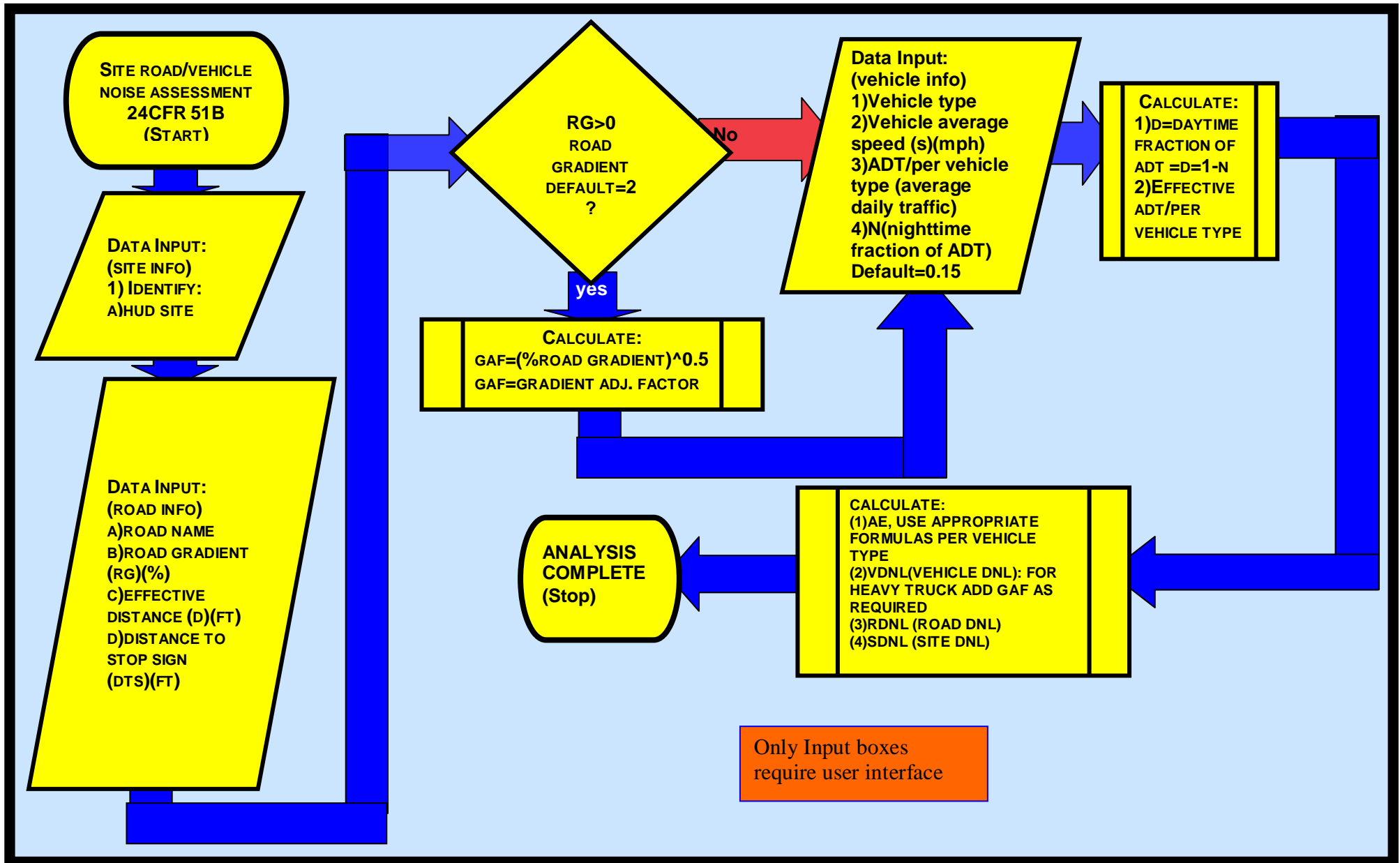
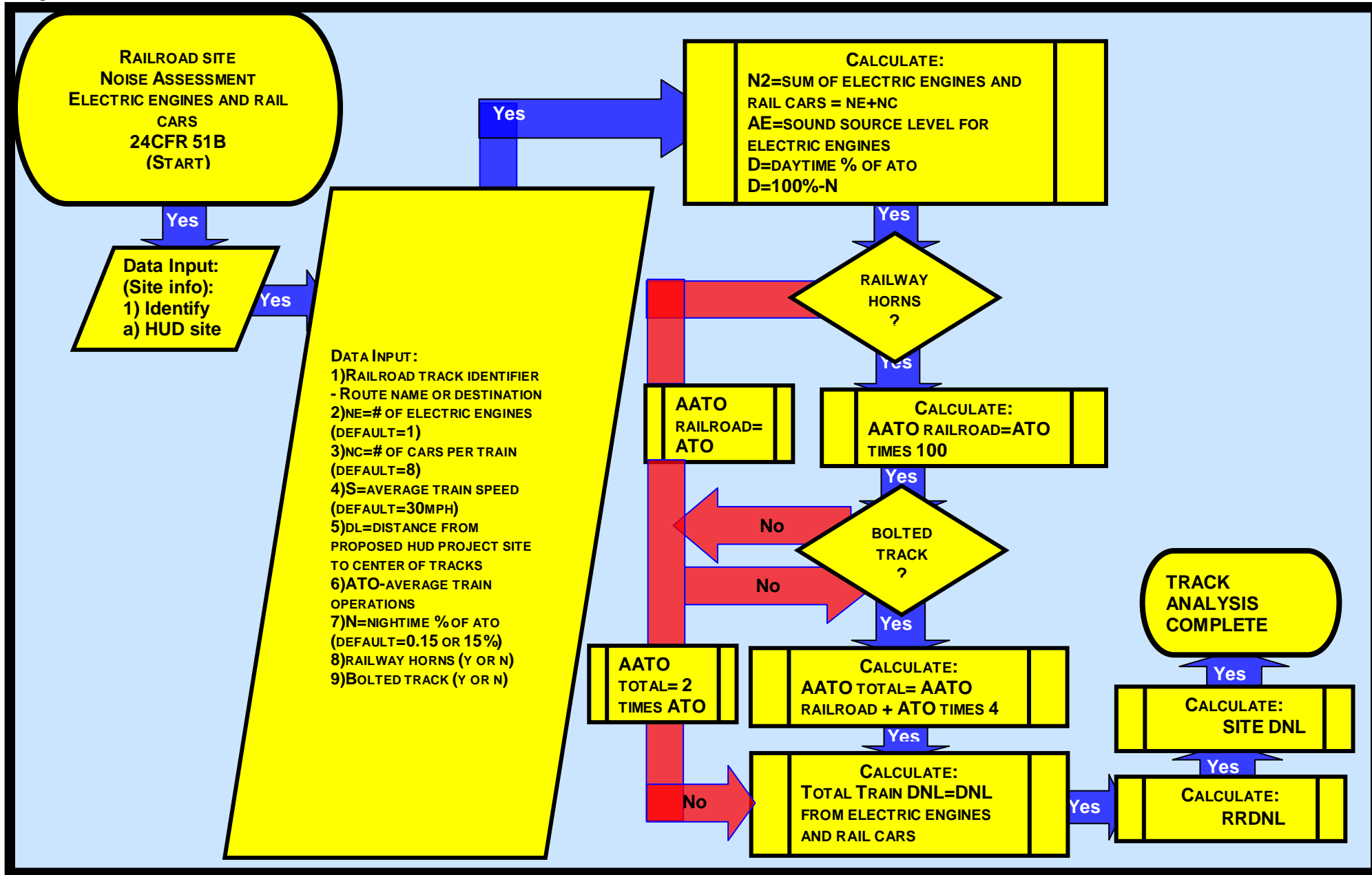


Algorithm for Calculation of Site road/vehicle noise assessment, in accordance with 24 CFR Part 51. Sound source level for automobiles = $AE = 64.6 + 20 \cdot \log_{10}[S] - 15 \cdot \log_{10}[D]$, Sound source level for medium sized trucks = $AE = 74.6 + 20 \cdot \log_{10}[S] - 15 \cdot \log_{10}[D]$, 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*(factor from table#8-HUD noise guidebook), EADT for medium sized trucks = ADT*10*DTS equation, EADT for cars = ADT*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) = $AATO_r = \text{Average Train Operations (ATO)} \times 100$. Adjusted Average Train Operations (Total) = $AATO_{total} = AATO(\text{railroad}) + AATO \times 4$. Day/Night Electric Engine and Rail Car Sound Level = $DNL = AE + 10 * \text{Log}_{10}[AATO_{total} * (d + 10 * N)] - 49.4$, where $d = \text{daytime percent use of AATO}$, $N = \text{night time percent use of AATO}$, $D = 100\% - N$ - 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 REVISED - 12-17-08

