



b = Length of the queue at the end of the red phase
 a = Maximum queue length

$$\begin{aligned}
 b &= w_{13} * 30 \\
 &= \frac{q_1 - q_3}{k_1 - k_3} * 30 \\
 &= \frac{35 * 46 - 0}{46 - 125} * 30 * 1.47 \\
 &= -20.38 * 30 * 1.47 \\
 &= -898 \text{ ft}
 \end{aligned}$$

$$\begin{aligned}
 a &= \frac{w_{13} w_{34}}{w_{34} - w_{13}} \\
 w_{34} &= \frac{q_3 - q_4}{k_3 - k_4} \\
 &= \frac{0 - 1900}{125 - 52} \\
 &= 26 \text{ mph} \\
 &= 38 \text{ ft/s}
 \end{aligned}$$

$$\begin{aligned}
 \therefore a &= \frac{30 * (30) * 38}{38 - 30} \\
 &= 4275 \text{ ft}
 \end{aligned}$$

$$\begin{aligned}
 \text{Time to dissipate} &= \frac{w_{13}}{w_{13} - w_{34}} \\
 &= 188 \text{ Sec.}
 \end{aligned}$$