Adiabatic + Reversible process $\rightarrow$ Isentropic

(no heat) (friction loss)

$V_1 = 75 \text{ mph}$
$= 33.5 \text{ m/s}$

$h_2 = h_{02} = h_{01} = c_p T_1 + \frac{1}{2} V_1^2 = 1004 \text{ J/kg \cdot K} \cdot 300 \text{ K} + \frac{1}{2} 33.5^2 \text{ m}^2/\text{s}^2$

$h_2 = 301761.1 \text{ J/kg}$

$T_2 = h_2/c_p = 300.56 \text{ K}$

$\Delta T = 0.56 \text{ K}$

$p_2 = p_{02} = p_0 = p_1 \left[1 - \frac{V_1^2}{2 h_{01}}\right] = p_1 \cdot 1.00654$

$p_2 = 1.00654 \times 10^5 \text{ Pa}$

$\Delta p = 654 \text{ Pa} \propto \frac{1}{2} \rho V_1^2$ (low speed)

$\Delta p \text{ is OK to use Bernoulli, here}$

$p_2 = p_{02} = p_{01} = p_1 \left[1 - \frac{V_1^2}{2 h_{01}}\right] = p_1 \cdot 1.00466$

$p_2 = 1.2056 \text{ kg/m}^2$

Note: Data as given doesn't exactly satisfy state equation. Some numerical differences will occur if the state equation is used instead of one of the adiabatic or isentropic relations.