

Equation A: $x_2(t_0) - x_1(t_0) = lane - width$

Equation B: $y_1(t_e) - y_2(t_e) = L_d + vehicle_length$

Equation C: $v_y(t) = v_y(t_0) + \int_{t_0}^t a_y(u) du$

Equation D:

$$y(t) = y(t_0) + \int_{t_0}^t v_y(u) du = y(t_0) + v_y(t_0) \times (t - t_0) + \int_{t_0}^t \int_{t_0}^w a_y(u) du dw$$