

$$x_1'(t) = -((0.06 * x_1(t) * (1 - \exp(d * x_5(t)))) - (0.05 * x_3(t) * (\exp(d * x_5(t)))) - ((0.5 * x_1(t) * (\exp(d * x_5(t))) * (0.3 + x_6(t))) * AE - (0.1 * x_2(t) * (1 - \exp(d * x_5(t)))))); \quad (1)$$

$$x_2'(t) = (((0.5 * x_1(t) * (\exp(d * x_5(t))) * (0.3 + x_6(t))) * AE - (0.1 * x_2(t) * (1 - \exp(d * x_5(t)))))) + (0.8 * x_3(t) * (\exp(d * x_5(t))) * (0.3 + x_6(t)) - (0.4 * x_2(t) * ((1 - \exp(d * x_5(t))^2)))) - (x_2(t) * (x_6(t) - x_4(t))); \quad (2)$$

$$x_3'(t) = ((0.06 * x_1(t) * (1 - \exp(d * x_5(t)))) - (0.05 * x_3(t) * (\exp(d * x_5(t)))) - (0.8 * x_3(t) * (\exp(d * x_5(t))) * (0.3 + x_6(t)) - (0.4 * x_2(t) * ((1 - \exp(d * x_5(t))^2)))); \quad (3)$$

$$x_4'(t) = (x_2(t) * (x_6(t) - x_4(t))); \quad (4)$$

$$\mathbf{if}((x_5(t)/LCC) < 1) \text{ --- } x_5'(t) = x_5(t) * (GU - (x_5(t)/LCC)); \quad (5) \\ \mathbf{else} \text{ --- } x_5'(t) = x_5(t) * (1 - (x_5(t)/LCC));$$

$$x_6'(t) = 0.2 * ((x_2(t-5*delta t) + 0.5 * x_4(t-5*delta t)) * (\exp(d * x_5(t-5*delta t)))) * (1 - x_6(t)) * (1 - x_7(t)) * AE - ((0.1 + 1 - \exp(d * x_5(t))) * (0.1 + x_7(t)) * x_6(t) * 0.2) \quad (6)$$

$$x_7'(t) = ((x_6(t-10*delta t) * (\exp(d * x_5(t-10*delta t)))) * (1 - x_7(t)) * 0.1 * AE - (x_7(t) * 0.005) \quad (7)$$