$$F(t) = \begin{pmatrix} \beta_1 I_1(t) \dfrac{S(t)}{N} & 0 \\[2ex] \beta_2 I_2(t) \dfrac{S(t)}{N} & 0 \end{pmatrix} \quad G(t) = \begin{pmatrix} 0 & \gamma_1 I_1(t) \\[2ex] 0 & 0 \end{pmatrix} \quad \mu(t) = \begin{pmatrix} 0 \\[2ex] \gamma_2 I_2(t) \end{pmatrix}$$