$$min \sum_{r \in \mathcal{R}} C_r x_r \tag{1}$$

subject to

$$\sum_{r \in \mathcal{R}} A_{ir} x_r \geq 1, \quad i \in \mathcal{O} \tag{2}$$

$$\sum_{r \in \mathcal{R}} B_{vdr} x_r \leq 1, \quad v \in \mathcal{V}, \quad d \in \mathcal{D} \tag{3}$$

$$\sum_{r \in \mathcal{R}} Y_{adr} x_r + i_{a,d-1} - i_{ad} = S_{ad}, \quad a \in \mathcal{A}, \quad d \in \mathcal{D} \tag{4}$$

$$x_r \in \{0, 1\}, \quad r \in \mathcal{R} \tag{5}$$

$$S_{ad} \geq i_{a,d-1} \geq 0, \quad a \in \mathcal{A}, \quad d \in \mathcal{D} \tag{6}$$

$$i_{ad} \leq U_a, \quad a \in \mathcal{A}, \quad d \in \mathcal{D} \tag{7}$$

$$i_{a,|\mathcal{D}|} = 0, \quad a \in \mathcal{A} \tag{8}$$