Two types of links are considered: priority links and non-priority links. Non priority links have been assigned type=0. Priority links have been assigned type=1. If link a is of type 0, then the set of links with priority on it are those links of type 1 entering the same junction as link a.

Link travel time (minutes) for a non priority link a is given by:

$$f_a(x) = t_f^a + \frac{1}{\theta}\ln\left(1 + e^{\theta b\left(x_a(v)-1\right)}\right)$$

Where v is the vector of link flow volumes, t_f^a is the free flow travel time of link a, $\theta = 0.2$, $b = 4$, and:

$$x_a(v) = \frac{v_a + \sum_{a \in X(a)} k_{a'} v_{x'}}{Hc_a}$$

In previous expression v_a is the flow on link a, c_a is the capacity of link a and $X(a)$ is the set of links with priority over link a. Constants $k_{a'}$ for links a' with priority over link a are evaluated as $k_{a'} = \frac{c_a}{c_{a'}}$. The hourly capacity coefficient c_a of non-priority links has been set to 25000 for the network of Hesse, 4000 for the network of Terrassa and 400 for the network of Winnipeg

For the priority links, the classical BPR function has been used for the link travel time:

$$f_a(v_a) = t_0 \cdot \left(1 + \alpha\left(\frac{v_a}{Hc_a}\right)^{\beta}\right)$$

where c_a is the capacity on link a, which is link dependent. t_0 is the link travel time (minutes) under free flow conditions, which has been set to 0.75; α and β are fixed parameters set to $\alpha = 0.1$ and $\beta = 1.5$ for all the test networks.

The length of the modeling time period has been set to H=21.5 hours for the network of Hesse, 5 hours for the network of Terrassa and to 7 hours for the network of Winnipeg. The O-D matrices are expressed in total trips for these periods.