Revised I/O Format

Adjacency Matrix

4

0 1 0 0

1 0 1 1

0 1 0 0

0 1 0 0

Wait Node Capacities

A: 10

B: 0

C: 12

D: 8

Traffic Controller Nodes

B

Initial traffic allocation

A: 10

C: 4

#Ambulances

A:4

C:1

#firetrucks

A:1

C:2

Destination Nodes

A:D

C:A

Priority Allocation formula

N_i: density at next hop for vehicles from source node i

A_i: Number of ambulances from source node i

F_i: Number of fire trucks from source node i

V_i: Total number of normal vehicles from source node i

C: Total capacity at current node

w_a: Ambulance weight

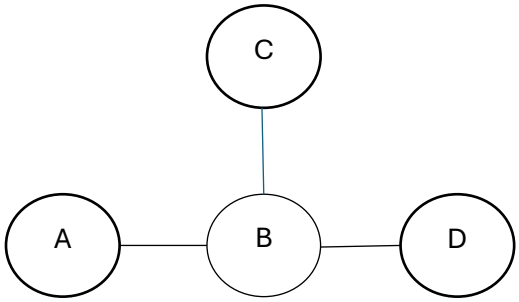
w_f: Fire truck weight

T: Time in seconds since last token allocation to current node

w_1 and w_2 are weights to be set on time and density according to your preference.

$$Priority = w_1 T + \frac{w_2}{C} \sum_{i=A}^{Z} \frac{w_a A_i + w_f F_i + V_i}{N_i}$$

Example of priority allocations



Suppose there are 2 types of traffic at A

1. E: 1 fire truck and 2 normal vehicles
2. F: 1 Ambulance and 1 normal vehicle

F and F's destination is C and D respectively with C having density of 20% and D having a density of 10%.

Given below is how the priority will be calculated for A (similarly priority will be calculate for all wait nodes adjacent to it)

$$Priority_A = 0.5 \times 2\,seconds + \frac{0.5}{10} \times \sum_{i=A}^{Z} \frac{7A_i + 7F_i + V_i}{N_i}$$

$$Priority_A = 0.5 \times 2\,seconds + \frac{0.5}{10} \times \left\{\frac{7 \times 0 + 7 \times 1 + 2}{0.2} + \frac{7 \times 1 + 7 \times 0 + 1}{0.1}\right\}$$

$$Priority_A = 1 + \frac{1}{20} \times \left\{\frac{90}{2} + 80\right\}$$

$$Priority_A = 1 + 6.25$$

$$Priority_A = 7.25$$