

Weight = Distance cost + Turn penalty + Collision risk cost + One-way aisle violation penalty + Docking station bias

$$w(i,j)=\alpha D_{ij}+\beta T_{ij}+\gamma C_{ij}+\delta U_{ij}+\epsilon R_j$$

$\alpha = 1.0$ (distance)

$\beta = 2.0$ (turns)

$\gamma = 3.0$ (collision)

$\delta = 1000$ (one-way violation)

$\epsilon = 0.5$ (dock attraction)

#####Code#####

```
def edge_cost(i, j, prev, traffic_map, docks, params):
```

```
    alpha, beta, gamma, delta, epsilon = params
```

```
    # 1. Distance (Manhattan)
```

```
    D = abs(i.x - j.x) + abs(i.y - j.y)
```

```
    # 2. Turn penalty
```

```
    if prev is None:
```

```
        T = 0
```

```
    else:
```

```
        T = turn_cost(prev, i, j) # 0, 1, or 2
```

```
    # 3. Collision / congestion
```

```
    C = traffic_map.get((i, j), 0)
```

```
    # 4. One-way aisle violation
```

```
    U = 0 if is_legal_direction(i, j) else 1
```

```
    # 5. Dock attraction
```

```
    R = min(abs(j.x - d.x) + abs(j.y - d.y) for d in docks)
```

```
    return (
```

```
        alpha * D +
```

```
        beta * T +
```

```
        gamma * C +
```

```
        delta * U +
```

```
        epsilon * R
```

```
)
```